How does it feel to be treated like an object? Direct and indirect effects of exposure to

sexual objectification on women's emotions in daily life

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Abstract

Exposure to sexual objectification is an everyday experience for many women, yet little is known about its emotional consequences. Fredrickson and Roberts's (1997) objectification theory proposed a within-person process, wherein exposure to sexual objectification causes women to adopt a third-person perspective on their bodies, labelled *self-objectification,* which has harmful downstream consequences for their emotional well-being. However, previous studies have only tested this model at the between-person level, making them unreliable sources of inference about the proposed intra-individual psychological consequences of objectification. Here, we report the results of Bayesian multilevel structural equation models that simultaneously tested Fredrickson and Roberts's (1997) predictions both within and between persons, using data from three ecological momentary assessment (EMA) studies of women's ($N = 268$) experiences of sexual objectification in daily life. Our findings support the predicted within-person indirect effect of exposure to sexual objectification on increases in negative and self-conscious emotions via self-objectification. However, lagged analyses suggest that the emotional consequences of exposure to sexual objectification may be relatively fleeting. Our findings advance research on sexual objectification by providing the first comprehensive test of the within-person process proposed by Fredrickson and Roberts's (1997) objectification theory.

Keywords: sexual objectification, emotion, daily life, EMA / ESM, multilevel mediation

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Most women around the world have experienced sexual objectification first-hand, often in the form of street harassment, such as being cat-called, ogled, wolf-whistled, or groped in public (Hollaback!, 2016). Naturalistic studies indicate that the average college-aged woman in the United States or Australia is targeted by sexually objectifying behaviors roughly every one to two days (Brinkman & Rickard, 2009; Holland, Koval, Stratemeyer, Thomson, & Haslam, 2017; Swim, Hyers, Cohen, & Ferguson, 2001). Even if a woman is not directly targeted by sexual objectification, she is likely to witness sexually objectifying treatment of other women regularly in her daily life, either in interpersonal encounters or in the form of sexualized representations of women in the media (Ward, 2016). Despite the prevalence of sexual objectification, few studies have investigated how real-world experiences of sexual objectification impact women's daily psychological well-being. We address this important question in the current paper by investigating the direct and indirect emotional impact of exposure to sexual objectification in women's daily lives using data from three ecological momentary assessment (EMA) studies.

Objectification Theory

The psychological consequences of sexual objectification were first comprehensively described in two landmark articles published in the late 1990s (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). In their objectification theory, Fredrickson and Roberts (1997) argued that exposure to sexual objectification is both directly and indirectly harmful to women's mental health and well-being. First, women's exposure to sexually objectifying events or environments is thought to directly cause distress and increase women's vulnerability to eating disorders, sexual dysfunction, anxiety, and depression (Fredrickson & Roberts, 1997; Szymanski, Moffitt, & Carr, 2011). However, Fredrickson and Roberts (1997) also proposed that sexual objectification may lead to psychological harm by a

second "indirect and insidious route" (p. 185), namely by prompting women to adopt a third-person objectified perspective on their own bodies, a psychic phenomenon termed *self-objectification* (see Figure 1). Fredrickson and Roberts (1997) further argued that self-objectification–involving a preoccupation with one's appearance and sexual worth–produces a host of harmful psychological consequences, including unpleasant and self-conscious emotions, such as anxiety and shame, which accumulate over time to increase women's risk of mental illness (see also McKinley & Hyde, 1996). Fredrickson and Roberts's landmark (1997) paper has inspired hundreds of empirical studies testing various predictions derived from objectification theory (for reviews, see Fredrickson et al., 2011; Roberts, Calogero & Gervais, 2018). Yet, few studies have explicitly tested the entire process model proposed by Fredrickson and Roberts (1997).
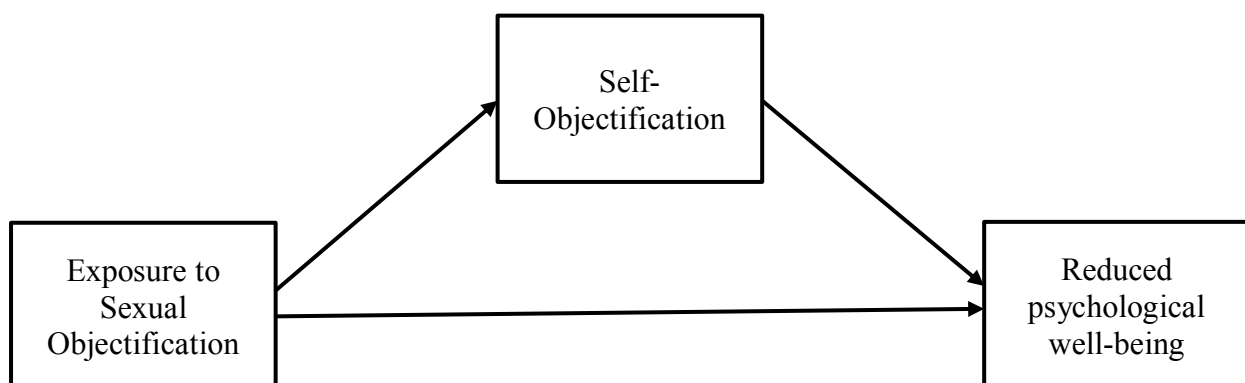
Figure 1. Theoretical model, in which exposure to sexual objectification is hypothesized to indirectly lead to reduced psychological well-being (e.g., increases in negative and self-conscious emotions) via self-objectification (see Fredrickson & Roberts; 1997; Roberts et al., 2018).

Previous Research Testing the Sexual Objectification Model

Previous research on sexual objectification has mostly been limited to testing individual paths from Fredrickson and Roberts's (1997) model. First, several studies have found that exposure to sexually objectifying experiences or events leads to increased self-objectification (e.g., Augustus-Horvath & Tylka, 2009; Karsay & Matthes, 2016). Others have investigated the direct emotional impact of exposure to objectification (e.g., Prichard &

Tiggemann, 2012; Pritchard, McLachlan, Lavis, & Tiggermann, 2018; Roberts & Gettman, 2004). Finally, a number of studies have demonstrated that self-objectification predicts lower well-being and greater negative emotions (e.g., Gapinski, Brownell & LaFrance, 2003; Mercurio & Landry, 2008; Miner-Rubino et al., 2002). Taken together, existing research provides support for each of the individual paths in Fredrickson and Roberts's (1997) model shown in *Figure 1*. However, studies testing the entire model are rare. Crucially, the only exceptions have been limited to examining between-person associations, testing whether individual differences in objectification and self-objectification are linked to individual differences in well-being. Such studies are not diagnostic of whether Fredrickson and Roberts's (1997) model accurately captures how the process of sexual objectification unfolds within individuals.

In one of the few studies to test the mediation model outlined in objectification theory (see Figure 1), Miles-McLean et al. (2015) found that experiences of interpersonal sexual objectification indirectly predicted higher trauma symptoms via increased self-objectification. However, these findings were based on cross-sectional data and therefore do not capture the within-person process of interest (Curran & Bauer, 2011; Wang & Maxwell, 2015). Specifically, Miles-McLean et al. (2015) demonstrated that women who report greater exposure to sexually objectifying events tend to be high in trait self-objectification, which itself is associated with greater trauma symptoms. However, such findings (see also Hebl, King, & Lin, 2004; Kozee, Tylka, Augustus-Horvath, & Denchik, 2007) do not demonstrate that when a woman encounters sexually objectifying behavior this predicts an increase in her level of state self-objectification, which is subsequently harmful to her well-being. In short, *inter*-individual associations assessed at one time-point do not provide evidence for a dynamic *intra*-individual process (Fisher, Medaglia, & Jeronimus, 2018). Importantly, such between-person associations are compatible with various psychological processes, including

some that conflict with objectification theory (e.g., women higher in trait self-objectification may be more prone to report incidents of sexual objectification).

Thus, our primary aim was to test Fredrickson and Roberts's (1997) hypothesized mediation model at the within-person level using intensive longitudinal EMA data.

Testing a Within-Person Process Model of Sexual Objectification

The psychological process outlined in objectification theory involves a "cascade of intra-individual psychological consequences" (p. 174) following exposure to sexually objectifying behaviors or environments (Fredrickson & Roberts, 1997). Specifically, the theory proposes that when a woman is confronted with sexual objectification she will become more intensely preoccupied with her appearance and value as a sexual object (i.e., increased self-objectification), which will, in turn, lead to reductions in her emotional well-being. How this process unfolds over time for a given individual (i.e., at the within-person level) is conceptually and statistically distinct from how it manifests in terms of cross-sectional associations at the between-person level (Hamaker, 2012; Molenaar & Campbell, 2009; Wang & Maxwell, 2015). To illustrate, consider that people who exercise more have a lower risk of heart attack than their inactive peers (i.e., exercise and heart attack risk correlate negatively between persons). However, an individual's risk of having a heart attack increases during/after exercising, meaning that exercise and heart attack risk actually correlate positively within persons, over time (Curran & Bauer, 2011). Thus, cross-sectional surveys are clearly not appropriate for studying within-person processes, such as the emotional impact of exposure to sexually objectifying events.

Ecological momentary assessment. One increasingly popular method for capturing within-person dynamics is EMA, which involves obtaining relatively frequent, momentary self-reports from participants while they go about their usual daily activities (Bolger & Laurenceau, 2013; Hamaker & Wichers, 2017). By combining naturalistic and real-time assessment, EMA also overcomes two major limitations of previous objectification research:

(i) EMA ensures high ecological validity, which is often lacking in lab experiments and undermines their generalizability to real-world functioning; and (ii) EMA eliminates or minimizes the influence of recall biases, which are known to distort self-reports on retrospective/trait questionnaires (Trull & Ebner-Priemer, 2014). Thus, EMA is an important and thus far under-utilized methodology for studying social psychological processes, such as sexual objectification, in daily life.

A handful of studies have investigated women's experiences of sexual objectification in daily life using EMA or diary methods (Breines, Crocker & Garcia, 2008; Brinkman & Rickard, 2009; Holland et al., 2017; Swim, Hyers, Cohen & Ferguson, 2001). These studies have separately tested individual paths from Fredrickson and Roberts's (1997) model, such as the impact of exposure to sexually objectifying events on state self-objectification (Holland et al., 2017) or emotions (Swim et al., 2001) in daily life. However, no previous EMA study has tested the within-person process model in its entirety. Furthermore, not all previous EMA studies of sexual objectification have measured the occurrence of other everyday stressors, which are known to impact emotional well-being (Almeida, 2005). Given that daily hassles may co-occur with sexually objectifying events, it is crucial to model the effects of both types of events to reveal the unique impact of sexually objectifying experiences on women's emotions.

Bayesian multilevel structural equation modeling. Although methods for testing multilevel mediation have existed for some time (Preacher, Zyphur, & Zhang, 2010), until recently they could not optimally handle within-person predictors with missing data (Asparouhov & Muthèn, 2018). Given that missing data are extremely common in EMA designs, this has represented a major challenge for obtaining unbiased estimates of within-person indirect effects using EMA data. Here, we took advantage of recent advances in Bayesian multilevel SEM as implemented in Mplus version 8.2 (Asparouhov & Muthèn,

2018), to test Fredrickson and Roberts's (1997) proposed mediation model at both the within-
and between-person levels using intensive longitudinal EMA data.

The Current Study

In the current study, we report analyses of EMA data from three samples of young
women who reported on their exposure to sexually objectifying events, their state levels of
self-objectification, and their momentary experiences of positive, negative and self-conscious
emotions in daily life over several days. Drawing on Fredrickson and Roberts's (1997)
objectification theory, we hypothesized that exposure to sexually objectifying events would
indirectly predict within-person increases in negative and self-conscious emotions over time,
via their within-person impact on heightened self-objectification. Furthermore, given that
some research has suggested that women may experience positive feelings in response to
objectifying encounters (e.g., Gervais et al., 2011; Liss, Erchull, & Ramsey, 2011), we also
examined the within-person effects of exposure to sexual objectification on women's positive
emotions. However, given that objectification theory does not predict such positive emotional
consequences to be mediated by increases in self-objectification, we did not expect to find a
within-person indirect effect of exposure to objectifying events on positive emotions via self-
objectification. Finally, we simultaneously tested an equivalent model at the between-person
level, allowing us to determine whether previously reported between-person associations
could be replicated.

<div align="center">Method</div>

Participants

We recruited three samples of women to complete an EMA study on their daily
experiences of sexual objectification. Sample 1 (collected in 2015)[1] comprises 82 women
recruited via advertisements posted online and around university campuses in Melbourne

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[1] We analyzed Sample 1 data for a previous manuscript (citation obscured for blind review) reporting on the
prevalence of sexual objectification in daily life and its impact on self-objectification. The current analyses are
distinct and have not been previously reported.

(Australia). One participant withdrew, leaving $n = 81$. Sample 2 (collected in 2016) comprises 90 women also recruited using similar methods in Melbourne. After excluding data from one participant due to low EMA compliance (she completed $< 35\%$ of scheduled EMA surveys) and from two others who participated in the study the previous year and were thus included in Sample 1, we were left with $n = 87$ for Sample 2. Finally, Sample 3 (collected in 2016-2017) comprises 100 women recruited in the greater St. Louis, Missouri area (USA) using similar recruitment methods as for the other two samples. No participants were excluded from Sample 3.

Taken together, Samples 1-3 comprise 268 women aged 18 to 46 years ($M = 24.26$, $SD = 5.61$) who reported their ethnicity as White/Caucasian (49%), Asian (27%), South Asian (7%), Black/African (4%), mixed (7%), or other (6%). Approximately 35% of all participants were born in the USA, 21% in Australia, and the remaining 44% in other countries. Most participants identified as heterosexual (82%), with the remainder identifying as bisexual (11%), homosexual[2] (4%) or "other" (3%). Just over half (53%) of all participants were single, 35% were in unmarried relationships, 10% were married, and 2% listed their relationship status as "other". Thus, our samples were relatively diverse in their demographic composition. Detailed demographic information for each sample is provided in the supplemental materials (see Table S1).

Materials and Procedure

Materials and procedure used in Sample 1 differed very slightly from those used in Samples 2 and 3, which were identical. All such methodological differences are noted below.

Before commencing the main EMA component of the study, participants attended an initial lab session in small groups (2-10 participants at a time) to receive detailed instructions

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[2] Although the term "homosexual" may be transitioning out of scientific usage, we use this term for consistency with our measure of sexual orientation: participants responded to the question "what is your sexual orientation?" by selecting "heterosexual", "homosexual", "bisexual" or "other". However, researchers may consider using alternative term(s) to measure self-reported sexual orientation in future research.

for the EMA and to complete questionnaires assessing demographics and other background

variables (not reported here). For several days after leaving the lab, participants reported on

their exposure to sexually objectifying events, their state levels of self-objectification, and

their momentary experiences of positive and negative feelings in daily life using a custom-

built EMA smartphone app called *SEMA2* (Harrison, Harrison, Koval, Gleeson, & Alvarez-

Jimenez, 2017).

Momentary emotions. Participants rated their current levels of several emotions

using items in the form of "Right now, how _____ do you feel?", with four items ("angry",

"sad", "anxious", "guilty") combined into a measure of *negative emotion*, two items

("happy", "confident") combined to form a measure of *positive emotion*, and a single item

("self-conscious"; Sample 1) or two items ("ashamed", "embarrassed"; Samples 2 & 3)

combined to form a measure of *self-conscious emotion*. All emotion items were rated on

slider scales from 0 (*not at all*) to 100 (*very much*) and were presented in a random order at

the beginning of each EMA survey. We assessed emotions first to avoid any influence of

recalling objectifying events and levels of self-objectification on momentary emotions.

State self-objectification. Next, participants rated their level of state self-

objectification "since the last survey" on a scale from 0 (*not at all*) to 100 (*very much*). In

Sample 1, state self-objectification was measured with a single item ("have you been thinking

about how you look to other people?"), whereas in Samples 2 and 3, two additional items

("have you felt self-conscious about your appearance?" and "have you been worried about

whether your clothes make you look good?") were added to create a three-item measure of

state self-objectification. These items were adapted from the self-surveillance subscale of

McKinley and Hyde's (1996) Objectified Body Consciousness Scale, a widely used measure

of trait self-objectification. Importantly, state self-objectification was measured before

participants reported on their exposure to sexually objectifying events to avoid event-recall

influencing ratings of self-objectification.

Exposure to sexually objectifying events. Participants reported whether they had been targeted by one or more sexually objectifying behaviors "since the last survey", with the following response options adapted from Kozee et al.'s (2007) Interpersonal Sexual Objectification Scale: (i) *catcalling, wolf-whistling, or car honking*; (ii) *sexual remark made about body*; (iii) *touched/fondled against will*; (iv) *body looked at sexually*; (v) *degrading sexual gesture*; (vi) *other objectifying behavior not listed above*; or (vii) *none of the above*. Participants also reported whether they had witnessed one or more of the above forms of sexual objectifying behavior directed at other women. The witnessing item included an additional response option (*media image/video*) to capture exposure to sexualized depictions of women in the media. Following Holland et al. (2017), we constructed binary *target* and *witness* variables, for which a value of 1 indicated the occurrence of one or more sexually objectifying events and a value of 0 indicated no objectifying event.

Exposure to other stressors/hassles. In Samples 2 and 3, the last item in the EMA survey asked participants to report "other stressors/hassles, since the last survey" (1=*yes*; 0=*no*). As described below, responses to this item were used to control for the emotional impact of stressors when estimating effects of exposure to objectifying events.

EMA protocol

During the initial lab session, participants downloaded the EMA app (*SEMA2*) onto their personal Android or iOS smartphone. A researcher provided detailed instructions for completing the EMA surveys and participants were given an opportunity to ask clarification questions while completing a demo survey before leaving the lab.

Participants in Sample 1 were prompted to complete EMA surveys every 84 ± 30 minutes between 10 a.m. and midnight (i.e., approximately 10 EMA surveys daily) for seven consecutive days. Participants in Samples 2 and 3 were prompted to complete EMA surveys every 60 ± 30 minutes (i.e., approximately 14 EMA surveys daily) for five consecutive days. Participants in all samples were therefore prompted to complete approximately 70 EMA

surveys over the duration of the EMA study. To prevent back-filling, EMA surveys expired

after 15 min and any incomplete items were marked as missing. An entire EMA survey was

considered missing only if no responses were recorded.

Following standard practice in EMA studies, reimbursement was partially

contingent upon completion of EMA surveys. Participants in Samples 1 and 3 received

between $30 and $50 cash (contingent upon EMA compliance). In Sample 2, all participants

received a $50 gift-card and those who completed at least 50% of scheduled EMA surveys

were entered into a raffle to win one of 10 additional $50 gift-cards, with the number of raffle

entries allocated to each participant dependent on their EMA compliance.

Overall, participants completed an average of 81.4% of scheduled EMA surveys

(Range = 38-–100%, SD = 13.2%), reflecting very good compliance. Mean EMA compliance

rates were 83.7%, 81.6%, and 79.4% for Samples 1, 2, and 3, respectively.

Data analytic strategy

We sought to maximize the statistical power and reliability of our analyses in two

ways. First, given that power is heavily influenced by the number of upper-level units (i.e.,

participants) in multilevel designs (Bolger & Laurenceau, 2013), we conducted our main

analyses using the combined data from all three samples (N = 268). This approach, referred to

as "mega-analysis" (e.g., Fleeson & Gallagher, 2009), is often preferred over traditional

meta-analysis when all raw data are available (Steinberg et al., 1997). We conducted

additional analyses to test for possible differences between the three samples, which we

report in the supplemental materials (see Tables S4-S7).[3] Second, after collecting data for

Sample 1, in which we assessed two of our central constructs (i.e., self-conscious emotion

and self-objectification) with single items, we decided to use multi-item scales to assess these

constructs in Samples 2 and 3 to increase reliability and therefore maximize statistical power.

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[3] Additional analyses revealed that while some parameter estimates differed between samples, the hypothesized within-person indirect effects of objectifying events on negative and self-conscious emotions (via self-objectification) were consistently positive (see pp. 3-8 in supplemental for further details).

For multi-item scales (negative emotion and positive emotion in all samples; self-conscious emotion and self-objectification in Samples 2 and 3), we calculated mean scores by averaging responses across the relevant items at each EMA survey. Multilevel reliability coefficients for these scales are reported in Table 1. The data from all three samples were 'stacked' together for our main analyses and thus slightly different operationalizations of self-conscious emotion and self-objectification were treated as equivalent for our main analyses. However, separate analyses for each sample are also reported in the Supplemental Materials.

To account for the hierarchical data structure (EMA surveys nested within participants) we analyzed data using multilevel SEM in Mplus version 8.2 (Muthén & Muthén, 1998-2017). Specifically, we followed the general multilevel mediation approach described by Preacher et al. (2010) to estimate a series of multilevel mediation models, including both direct and indirect (via self-objectification) effects of exposure to sexually objectifying events (as target or witness) on momentary negative, self-conscious and positive emotions. At the within-person level, the EMA data have a longitudinal structure, which we accounted for by estimating lagged associations between variables, as described below and illustrated in Figure 2. We ran separate models for each emotion (negative, self-conscious, positive) and each type of exposure (target, witness), resulting in a total of six models.

In line with Fredrickson and Roberts's (1997) theoretical predictions, our main focus was on modeling direct and indirect effects at the within-person level, where the emotional consequences of sexual objectification are predicted to unfold. Thus, it was essential to decompose our observed variables (comprising within- and between-person variance) into separate within- and between-person components (Kenny, Korchmaros, & Bolger, 2003; Preacher et al., 2010). This can be done in Mplus by modeling the within- and between-person components of an observed variable as latent variables, a technique known as *latent centering*, as shown in the left panel of Figure 2 (Asparouhov & Muthèn, 2018).
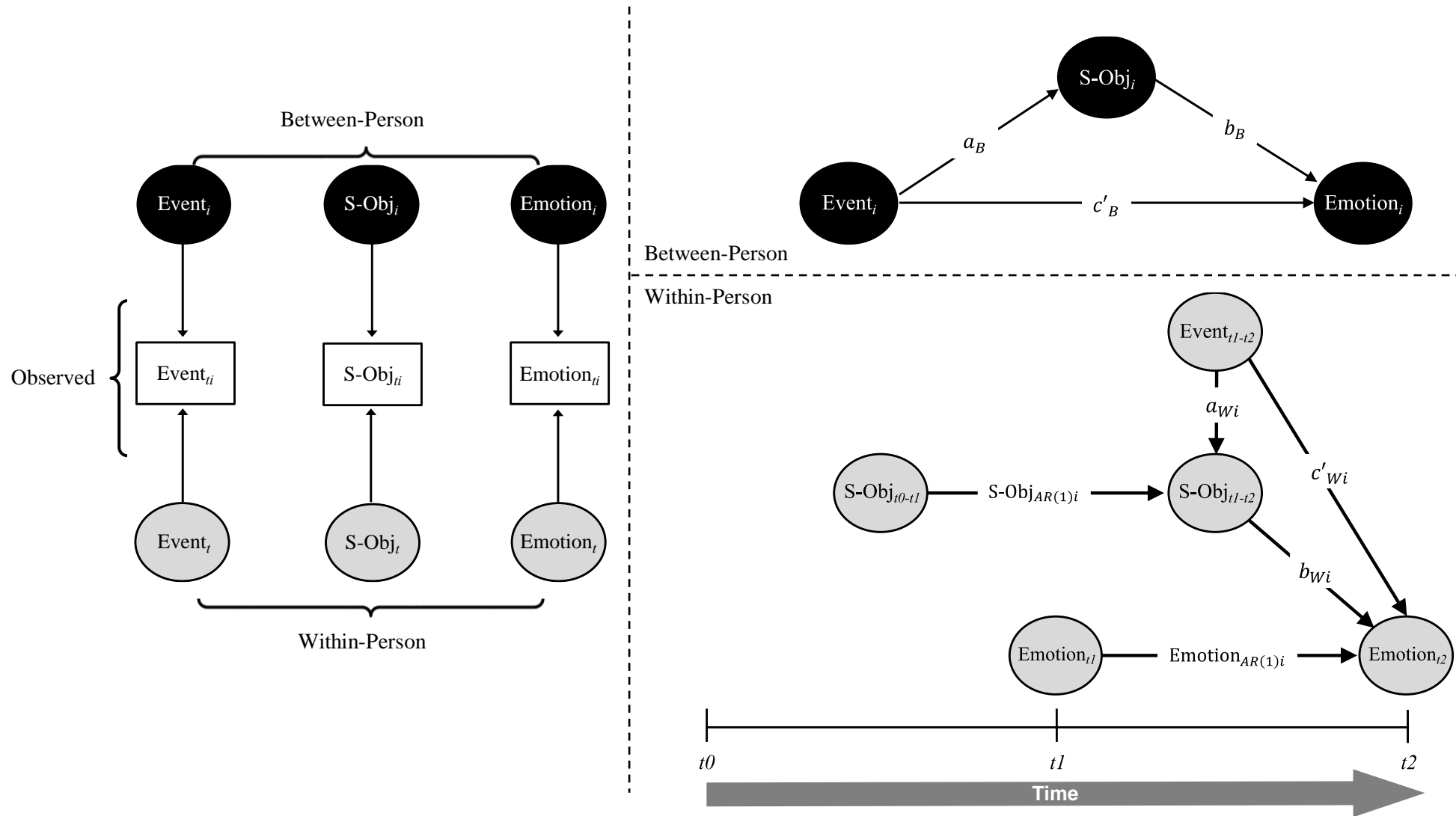
Figure 2. Multilevel mediation model tested. The left panel shows the decomposition of observed variables (rectangles) into their latent within-person (grey ellipses) and between-person (black ellipses) components. The right panels show the model estimated at the within- and between-person levels. Note that within-person paths are labeled with the subscript *i*, indicating that they were estimated as random slopes and thus vary across individuals *i*. AR(1) paths were estimated within-persons for self-objectification (S-Obj), and Emotion, to control for temporal carry-over and model change in these variables. All random effects were allowed to covary between-persons.

Within-person model. As shown in the bottom-right panel of Figure 2, we estimated the

within-person effects of exposure to objectification on self-objectification and emotions using

latent-centered within-person variables. Specifically, emotional intensity at time *t2*

(Emotion$_{t2}$) was regressed onto objectifying events (Event$_{t1\text{-}t2}$) and state self-objectification

(S-Obj$_{t1\text{-}t2}$) reported as occurring in the interval between *t1* and *t2* (denoted with the subscript

$_{t1\text{-}t2}$).[4] These paths represent the within-person lagged effect of exposure to sexual

objectifying events on emotions (path c'_{Wi}) and the within-person lagged effect of state self-

objectification on emotions (path b_{Wi}), respectively. Self-objectification was also regressed

onto events to estimate the within-person effect of exposure to sexually objectifying events

on self-objectification (path a_{Wi}). To ensure that we were modeling change over time in the

two outcome variables, we simultaneously estimated autoregressive slopes for emotions and

self-objectification (Emotion$_{AR(1)i}$ and S-Obj$_{AR(1)i}$) by including lagged versions of these

variables as predictors.[5] Within-person paths were estimated as random slopes that were

allowed to vary across individuals, as indicated by the subscript *i* for all within-person model

parameters shown in Figure 2. Following Preacher et al. (2010; see also Bolger &

Laurenceau, 2013), within-person indirect effects were calculated as the product of the

average within-person a_{Wi} and bw$_i$ paths, plus the covariance of the a_{Wi} and b_{Wi} paths (i.e.,

$indirect_W = \overline{a_W} \times \overline{b_W} + cov(a_{Wi}, b_{Wi})$). Within-person total effects were calculated by

summing the direct effect (path c'_W) and indirect effect ($total_W = c'_W + indirect_W$; see Bolger

and Laurenceau, 2013).

    Between-person model. We estimated similar models using the latent between-

person components of each variable (see top-right panel of Figure 2). At the between-person

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[4] While all variables in the model were measured at the same occasion (time *t2*), exposure to objectifying events
(Event$_{t1\text{-}t2}$) and state self-objectification (S-Obj$_{t1\text{-}t2}$) were reported as occurring "since the last survey" and can
therefore be assumed to temporally precede momentary emotions, reported as "right now".

[5] Because the lagged predictors (Emotion$_{t1}$ and S-Obj$_{t0\text{-}t1}$) were only included in the within-person model, they
were centered using observed mean-centering rather than latent centering.

level, path a_B represents the effect of mean exposure to sexually objectifying events (Event$_i$)

on mean levels of self-objectification (S-Obj$_i$). Path b_B represents the association between

mean levels of self-objectification (S-Obj$_i$) and mean levels of emotions (Emotion$_i$). Finally,

path c'_B captures the direct relationship between mean exposure to sexually objectifying

events (Event$_i$) and mean levels of emotion (Emotion$_i$). As in regular single-level mediation,

the between-person indirect effect was calculated as the product of the a_B and b_B paths

($indirect_B = a_B \times b_B$) and the between-person total effect was calculated by summing the direct

(path c'_B) and indirect effects ($total_B = c'_B + indirect_B$).

     Bayesian estimation. We used Bayesian estimation for all multilevel models

reported, which overcomes two major limitations of the more commonly used maximum

likelihood estimation. First, because our models were complex (i.e., they included multiple

random effects, categorical variables, and missing data) maximum likelihood estimation

requires the use of numerical integration, an extremely inefficient approach that produces

imprecise estimates and often results in convergence problems (Asparouhov & Muthèn,

2018). Second, Bayesian estimation does not assume that model parameters are normally

distributed. This is a particularly problematic assumption for indirect effects, which are

known to be skewed (Shrout & Bolger, 2002; Yuan & MacKinnon, 2009). Instead, Bayesian

posterior distributions of model parameters (including indirect effects) can take any form.

Importantly, we used the Mplus default uninformative priors (see Asparouhov & Muthèn

2018), resulting in parameter estimates that are driven primarily by the data and are therefore

similar to estimates obtained using maximum likelihood estimation (Yuan & MacKinnon,

2009; Zyphur & Oswald, 2015). To ensure stable parameter estimates, all models used a

minimum of 20,000 Bayesian iterations, checking to ensure models had converged by the

10,000[th] iteration using posterior scale reduction (PSR) values below 1.05—the first half of

iterations are dropped as a 'burn in' period. For each model parameter's posterior

distribution, we report the median (point estimate), standard deviation (akin to a standard error), and the 2.5 and 97.5 percentile values (forming 95% credibility intervals; CIs). We consider model parameters to be meaningfully different from zero when their 95% CIs do not cross zero.

Open practices

The data and all Mplus input and output files required to reproduce the analyses reported in the paper and supplemental materials are available in a public repository on the Open Science Framework (OSF), available at https://osf.io/tz9wn/.

Results

Descriptive statistics and reliability estimates for all continuous measures are shown in Table 1 (see Table S2 in supplemental materials for separate values for each sample). We estimated within- and between-person alpha reliability coefficients following Geldhof, Preacher and Zyphur (2014).[6] As shown in Table 1, all scales showed adequate reliability (rs $\geq$ .48, ωs $\geq$ .62) within- and between-persons. As shown in Table 1, each measure had substantial variance ($\geq$ 43%) at both the within- and between-person levels. Thus, the data were appropriate for multilevel analyses.

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[6] Given the limitations of alpha as an index of reliability (see e.g., Sijtsma, 2009), we also ran multilevel CFAs to obtain estimates of omega reliability within (ω_W) and between (ω_B) persons (see Bolger & Laurenceau, 2013; Geldhof et al., 2014). Multilevel omegas for Negative Emotion ($\omega_W = 0.62$, 95%CI [0.61, 0.63], $\omega_B = 0.89$, 95% CI [0.87, 0.91]) and Self-Objectification ($\omega_W = 0.89$, 95%CI [0.89, 0.89], $\omega_B = 0.99$, 95% CI [0.99, 0.99]) were very similar to the alpha values reported above. We estimated multilevel correlations for the two-item measures of Positive Emotion ($r_W = 0.48$, 95%CI [0.47, 0.49], $r_B = 0.83$, 95% CI [0.79, 0.86]) and Self-Conscious Emotion ($r_W = 0.51$, 95%CI [0.50, 0.52], $r_B = 0.96$, 95% CI [0.95, 0.97]) as multilevel CFAs would have been under-identified.

Table 1

Descriptive statistics and reliability estimates for continuous measures

Measure	Sample size		Mean	SD (% variance)		Cronbach's alpha	
	T	N		Within	Between	Within	Between
Negative Emotion	15657	268	16.09 [14.40, 17.70]	12.27 (45%) [12.14, 12.41]	13.54 (55%) [12.41, 14.79]	0.61 [0.60, 0.62]	0.88 [0.86, 0.90]
Positive Emotion	15634	268	59.37 [57.23, 61.47]	17.85 (51%) [17.65, 18.05]	17.36 (49%) [15.96, 19.06]	0.65 [0.64, 0.66]	0.90 [0.87, 0.92]
Self-Conscious Emotion	15584	268	14.36 [12.29, 16.58]	15.14 (43%) [14.97, 15.31]	17.57 (57%) [16.16, 19.24]	0.68[a] [0.66, 0.69]	0.98[a] [0.97, 0.99]
Self-Objectification	15531	268	26.01 [23.45, 28.79]	22.04 (50%) [21.79, 22.28]	21.87 (50%) [20.01, 23.84]	0.89[a] [0.88, 0.89]	0.99[a] [0.99, 0.99]

Note. T = number of occasions; N = number of participants; values in square brackets are 95% Bayesian credible intervals; all measures were assessed on scales from 0 (*not at all*) to 100 (*very much*).

[a] Alphas for self-conscious emotion and self-objectification are based on Sample 2 and 3 data only because single-item measures were used in Sample 1.

Frequency data for objectifying events are shown in Table 2 (see Table S3 in the supplemental materials for frequencies for each sample). Overall, 66% of participants reported being targeted by sexual objectification at least once, and 85% reported witnessing at least one sexually objectifying event during the course of the study. Given the relatively low prevalence of sexually objectifying events (from a statistical perspective), we sought to maximize power and obtain more reliable parameter estimates by conducting analyses using data from all three samples.

Table 2

Descriptive statistics for exposure to sexually objectifying events reported as target and witness

	N (%) of participants reporting 1 or more events	Frequency of events			Proportion of EMA surveys with events		
		Range	Median	Mean (SD)	Range	Median	Mean (SD)
Target	177 (66%)	0–27	1.00	2.75 (4.28)	0.00–0.38	0.02	0.05 (0.07)
Witness	227 (85%)	0–58	4.00	7.80 (11.04)	0.00–1.00	0.07	0.13 (0.19)

Note. N (%) > 0 = number (percentage) of participants who reported being targeted by or witnessing sexually objectifying events at least once.
Frequency = number of EMA surveys on which participants reported being targeted by or witnessing sexually objectifying events.
Proportion = proportion of EMA surveys on which participants reported being targeted by or witnessing sexually objectifying events.

Multilevel mediation analyses

Estimates of direct, indirect (via self-objectification) and total effects of exposure to objectifying events on negative, self-conscious, and positive emotions, are shown in Table 3.

Within-person effects. Estimates of a_W paths in Table 3 indicate that exposure to sexually objectifying events predicted reliable increases in state self-objectification. Specifically, on average, state self-objectification (measured on a 0-100 scale) increased by approximately 11 scale points after being targeted by sexually objectifying behavior, and by approximately three points after witnessing sexual objectifying treatment of other women.

Estimates of b_W paths in Table 3 show that increases in self-objectification were associated with small, yet reliable, increases in negative and self-conscious emotions, but also with increases in positive emotions. Specifically, on average, a six-point increase in self-objectification was associated with a one-point increase in self-conscious emotions, whereas an increase of 20 and 33 points in self-objectification predicted a one-point increase in negative and positive emotions, respectively. Supporting Fredrickson and Roberts's (1997) predictions, exposure to sexually objectifying events had a reliable indirect effect on negative and self-conscious emotions via self-objectification (see *indirect$_W$* estimates in Table 3). In contrast, the indirect effects of exposure to objectifying events on positive emotions via self-objectification were not meaningfully different from zero.

Estimates of c'_W paths in Table 3 indicate that exposure to sexually objectifying events did not have reliable direct effects on any of the emotional outcomes.

Finally, estimates of within-person total effects revealed that the combined (direct and indirect) effect of being targeted by sexually objectifying events was predicted to be approximately 1.8 and three-point increases in negative and self-conscious emotions, respectively. In contrast, the total effects of witnessing objectifying events on negative and self-conscious emotions were not reliably different from zero, and neither being targeted nor witnessing predicted overall changes in positive emotions. Separate analyses per sample produced substantively similar findings, although with less precise and reliable parameter estimates than the combined analyses (see Tables S5-S7 in the supplemental materials).

Given that our primary focus in the current study was to test a within-person mediation model, wherein exposure to objectifying events indirectly influences emotions via self-objectification, we sought to rule out two alternate explanations for the above findings: (i) that the emotional consequences of sexually objectifying events are (partly) driven by their co-occurrence with other daily stressors and (ii) that increases in self-objectification precede reported exposure to sexually objectifying events rather than vice versa.

Controlling for reactivity to other stressors. Exposure to sexually objectifying events may be likely to co-occur with other unpleasant or stressful events, which are themselves known to reliably impact emotions (Almeida, 2005). To investigate whether the indirect emotional impact of sexually objectifying events was independent of reactivity to other daily stressors, we ran additional analyses using data from Samples 2 and 3, in which self-objectification (mediator) and emotions (outcome) were simultaneously regressed onto objectifying events and other stressful events (see Figure S1 in the supplemental materials). These analyses revealed that indirect effects of exposure to objectifying events on negative and self-conscious emotions were slightly weaker after controlling for reactivity to other daily stressors. However, all previously significant indirect effects remained positive and reliably greater than zero, except for the indirect effect of being targeted on negative emotions (see Table S8 in the supplemental materials).

Table 3

Results of multilevel mediation models testing effects of exposure to objectifying events on emotions via self-objectification

Outcome	Parameter	Target		Witness	
		Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	a_W	**11.13 (1.29)**	[8.50, 13.58]	**3.15 (0.73)**	[1.78, 4.61]
	b_W	**0.05 (0.01)**	[0.03, 0.06]	**0.05 (0.01)**	[0.03, 0.06]
	c'_W	1.34 (0.73)	[-0.05, 2.82]	0.15 (0.37)	[-0.59, 0.85]
	$cov(a_W, b_W)$	-0.10 (0.13)	[-0.34, 0.16]	0.04 (0.07)	[-0.11, 0.18]
	$indirect_W$	**0.43 (0.16)**	[0.13, 0.73]	**0.19 (0.08)**	[0.03, 0.35]
	$total_W$	**1.76 (0.73)**	[0.33, 3.19]	0.34 (0.37)	[-0.43, 1.02]
	Between-Person				
	a_B	**0.88 (0.21)**	[0.48, 1.31]	**0.24 (0.07)**	[0.10, 0.38]
	b_B	**0.32 (0.03)**	[0.25, 0.39]	**0.33 (0.03)**	[0.26, 0.39]
	c'_B	0.22 (0.12)	[-0.01, 0.45]	0.06 (0.04)	[-0.02, 0.14]
	$indirect_B$	**0.28 (0.07)**	[0.14, 0.43]	**0.08 (0.02)**	[0.03, 0.13]
	$total_B$	**0.50 (0.13)**	[0.24, 0.75]	**0.14 (0.04)**	[0.05, 0.22]
Self-Conscious Emotion	Within-Person				
	a_W	**11.12 (1.32)**	[8.51, 13.71]	**3.09 (0.75)**	[1.66, 4.60]
	b_W	**0.16 (0.01)**	[0.13, 0.18]	**0.16 (0.01)**	[0.13, 0.18]
	c'_W	1.28 (0.91)	[-0.48, 3.06]	0.42 (0.55)	[-0.65, 1.49]
	$cov(a_W, b_W)$	0.00 (0.26)	[-0.50, 0.51]	0.03 (0.14)	[-0.25, 0.31]
	$indirect_W$	**1.74 (0.36)**	[1.06, 2.46]	**0.52 (0.19)**	[0.16, 0.89]
	$total_W$	**3.02 (0.94)**	[1.23, 4.88]	0.95 (0.57)	[-0.18, 2.04]
	Between-Person				
	a_B	**0.88 (0.21)**	[0.48, 1.29]	**0.24 (0.07)**	[0.10, 0.38]
	b_B	**0.48 (0.04)**	[0.40, 0.56]	**0.49 (0.04)**	[0.41, 0.57]
	c'_B	0.24 (0.14)	[-0.04, 0.51]	0.06 (0.05)	[-0.03, 0.15]
	$indirect_B$	**0.42 (0.11)**	[0.22, 0.64]	**0.12 (0.04)**	[0.05, 0.19]
	$total_B$	**0.66 (0.17)**	[0.33, 0.99]	**0.18 (0.06)**	[0.07, 0.29]
Positive Emotion	Within-Person				
	a_W	**11.06 (1.26)**	[8.58, 13.54]	**3.18 (0.74)**	[1.73, 4.68]
	b_W	**0.03 (0.01)**	[0.01, 0.05]	**0.03 (0.01)**	[0.01, 0.05]
	c'_W	0.78 (0.98)	[-1.11, 2.74]	0.04 (0.50)	[-0.94, 1.03]
	$cov(a_W, b_W)$	-0.22 (0.20)	[-0.64, 0.16]	-0.04 (0.12)	[-0.28, 0.19]
	$indirect_W$	0.10 (0.23)	[-0.35, 0.55]	0.06 (0.12)	[-0.18, 0.29]
	$total_W$	0.87 (0.98)	[-1.02, 2.81]	0.09 (0.51)	[-0.91, 1.07]
	Between-Person				
	a_B	**0.88 (0.21)**	[0.46, 1.28]	**0.24 (0.07)**	[0.10, 0.38]
	b_B	**-0.12 (0.05)**	[-0.22, -0.02]	**-0.10 (0.05)**	[-0.20, 0.00]
	c'_B	0.13 (0.18)	[-0.22, 0.47]	-0.05 (0.06)	[-0.17, 0.06]
	$indirect_B$	**-0.10 (0.05)**	[-0.21, -0.01]	**-0.02 (0.01)**	[-0.05, 0.00]
	$total_B$	0.03 (0.17)	[-0.31, 0.37]	-0.08 (0.06)	[-0.18, 0.04]

Note. CI = Bayesian credibility interval (highest posterior density); Parameters in bold have 95% CIs that do not cross zero. Estimates of all between-person paths (except path b_B) were divided by 100 so that 1 unit reflects a difference of 1% in prevalence of objectifying events.

Temporal precedence of objectifying events. The within-person indirect effects reported above are consistent with mediation only if we assume that exposure to objectifying events precedes increases in self-objectification. However, since both events and self-objectification were assessed as occurring "since the last survey" at the same measurement occasion (i.e., EMA survey), our findings are also potentially consistent with the opposite temporal ordering, in which increases in self-objectification predict greater reporting of objectifying events. To rule out this alternate interpretation, we used multilevel logistic regression models to investigate whether increases in state self-objectification predicted a greater probability of subsequently reporting exposure to objectifying events. These analyses revealed that the probability of reporting objectifying events (as either target or witness) at occasion $t2$ was not reliably predicted by levels of state self-objectification reported either at the previous ($t1$) or concurrent ($t2$) occasion (see Table S9 in the supplemental materials), while controlling for objectifying events at occasion $t1$. Thus, we found no evidence that increases in self-objectification predict an increased likelihood of reporting exposure to objectifying events.

Nevertheless, to conclusively test whether objectifying events predict subsequent increases in self-objectification, which subsequently predicts increases in negative and self-conscious emotions, we repeated our main multilevel mediation analyses with objectifying events measured at the previous measurement occasion to self-objectification. In these "doubly-lagged" models (see Figure S2 in the supplemental materials) the predictor (Event$_{t0-t1}$) was measured before the mediator (S-Obj$_{t1-t2}$), which is assumed to precede the outcome (Emotion$_{t2}$). As in our main analyses, we modelled the autoregressive slopes of self-objectification and emotions. These doubly-lagged analyses revealed that the indirect effects of exposure to objectifying events on negative and self-conscious emotions were no longer reliable (see Table S10 in the supplemental materials). As discussed further below, the results

of these doubly-lagged results do not necessarily undermine our main mediational findings. Instead, taken together with the previous results showing that self-objectification does not predict increases in exposure to objectification, these results suggest an effect of exposure to objectification on self-objectification, and subsequently on emotions, which is relatively rapid and may quickly fade with time.

Between-person effects. Estimates of between-person effects in Table 3 indicate that, consistent with previous cross-sectional studies, women who reported greater overall exposure to sexually objectifying events also reported higher mean levels of self-objectification (see estimates of a_B paths in Table 3). Furthermore, women with higher mean levels of self-objectification also tended to report higher mean levels of negative and self-conscious emotions and lower mean levels of positive emotions across the study period (see estimates of b_B paths in Table 3). Consistent with previous cross-sectional research, mean levels of exposure to sexually objectifying events (as target and witness) showed reliably positive indirect effects on mean levels of negative and self-conscious emotions via mean self-objectification, and exposure to objectifying events was indirectly (via mean self-objectification) associated with lower mean levels of positive emotions (see *indirect*$_B$ estimates in Table 3). Finally, although individual differences in mean exposure to objectifying events were not directly associated with mean levels of emotions (see c'_B paths in Table 3), the total effects of exposure to sexually objectifying events were reliably associated with higher mean levels of negative and self-conscious emotions (see *total*$_B$ estimates in Table 3). Total effects for positive emotions were not reliably different from zero.

Discussion

In a landmark publication that came to shape an entire area of research within psychology, Fredrickson and Roberts (1997) proposed that exposure to sexual objectifying experiences causes many women to adopt a third-person perspective on their bodies–

essentially sexually objectifying themselves–which, in turn, has harmful downstream consequences for women's well-being. Over the past two decades, research in this area has boomed, yielding many important insights into the psychology of sexual objectification (Loughnan & Vaes, 2017). Yet, few studies have captured the within-person psychological consequences of sexual objectification as they unfold in daily life. In particular, the intraindividual process model of sexual objectification proposed by Fredrickson and Roberts (1997) has remained untested. The current findings support Fredrickson and Roberts's (1997) prediction that the harmful consequences of exposure to sexually objectifying behavior on women's daily experiences of negative and self-conscious emotions are mediated by within-person increases in state self-objectification.

Associations between exposure to objectifying events and self-objectification

We found strong evidence that exposure to objectifying events in daily life primes a state of self-objectification, making women more conscious of how their body appears to others. This association between exposure to sexually objectifying events and the tendency to self-objectify was strongest when women reported being personally targeted by objectifying behaviour in daily life. However, just as breathing second-hand smoke is unhealthy for non-smokers, we found that objectifying events need not be experienced first-hand to induce the potentially harmful process of self-objectification. Witnessing sexual objectification of other women also reliably predicted within-person increases in state self-objectification in the current study.[7] Supporting previous correlational research (e.g., Augustus-Horvath & Tylka, 2009; Calogero & Pina, 2011), we found similar effects at the between-person level: women who reported greater overall exposure to objectifying events also reported higher mean levels of self-objectification across the study period. Taken together, these findings suggest that

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[7] These findings are consistent with our previous analyses reported in Holland et al. (2017), based exclusively on Sample 1 data. Our previous analyses examined the effect of exposure to objectifying events on self-objectification (path *a* in the model tested here) but did not simultaneously model the effects of self-objectification or exposure to objectifying events on emotions (paths *b* and *c′* in the model tested here).

exposure to objectifying events in daily life momentarily redirects women's attention to their appearance, but also that this process may accumulate over time, leading to increased habitual (i.e., trait) self-objectification in the long run. However, this between-person association may also reflect the opposite causal process, namely that women who are higher in trait self-objectification are more likely to notice sexually objectifying events. While we were not able to test this alternate mechanism in the current study, future research using traditional longitudinal designs could do so.

Associations between self-objectification and emotions

Regarding the association between self-objectification and momentary emotions, our findings are broadly consistent with previous research (e.g., Breines et al., 2008; Mercurio & Landry, 2008) in that greater state self-objectification predicted intraindividual increases in negative and self-conscious emotions. These findings suggest that engaging in body monitoring and other forms of self-objectification heightens women's experiences of unpleasant emotions such as anger, guilt, shame and embarrassment. Similarly, greater habitual self-objectification was related to higher mean levels of negative and self-conscious emotions between persons, indicating that women who are higher in chronic self-objectification also tend to experience more unpleasant affect, on average, in their daily lives.

However, the momentary emotional consequences of self-objectification were not exclusively negative: we also found that higher state self-objectification predicted within-person increases in positive emotions, suggesting that attending to their physical appearance may also increase women's feelings of confidence and happiness (see Calogero, Herbozo, & Thompson, 2009). However, we observed a starkly different association between self-objectification and positive emotions at the between-person level: women who reported higher mean levels of self-objectification experienced lower mean levels of positive emotions in daily life. This finding is generally consistent with previous findings linking trait self-

objectification with lower self-esteem (e.g., Strelan, Mehaffey, & Tiggermann, 2003) and psychological well-being (e.g., McKinley, 2006). Thus, whereas state self-objectification may be accompanied by momentary spikes in positive feelings, habitually engaging in self-objectification appears to be associated with lower tonic levels of positive emotions. These paradoxical findings highlight the importance of examining both within- and between-person effects, which may differ in both magnitude and direction (Fisher et al., 2018).

Indirect effects of objectifying events on negative and self-conscious emotions

The current study was the first, to our knowledge, to test the within-person indirect effect of exposure to sexually objectifying events on women's emotions in daily life, originally hypothesized by Fredrickson and Roberts (1997). Our findings therefore contribute to cumulative theoretical knowledge in the psychology of sexual objectification by providing the first evidence to support this hypothesis. Specifically, we found that despite not having a direct impact on women's emotions, exposure to sexually objectifying events in daily life reliably predicted increases in negative and self-conscious emotions via state self-objectification. These findings suggest that being targeted by or witnessing sexual objectification in daily life attunes women to their bodily appearance, which, in turn, intensifies women's experiences of negative (e.g., anger) and self-conscious (e.g., shame) emotions. Previous studies have tested individual paths from Fredrickson and Roberts's (1997) model, demonstrating that exposure to objectification predicts increases in self-objectification (e.g., Holland et al., 2017) and, separately, that state self-objectification is associated with heightened negative emotions (Breines et al., 2008). However, this is the first study to model these effects simultaneously and estimate the within-person indirect effect of exposure to sexually objectifying events on emotions via state self-objectification.

The within-person indirect effect of exposure to objectifying events was strongest for self-conscious emotions (embarrassment, shame) and when women were personally

targeted by objectifying behaviour. Similarly, at the between-person level, women who were more frequently targeted by objectifying experiences reported higher mean levels of self-conscious emotions, and this association was statistically accounted for by their higher mean levels of self-objectification. Although somewhat weaker, we also found evidence for reliable within- and between-person indirect effects of being targeted by objectifying events on general negative affect (anger, sadness, anxiety, and guilt). The estimated within- and between-person indirect effects of witnessing objectifying events on negative and self-conscious emotions were substantially weaker but still reliably different from zero.

Taken together, these findings suggest that even vicarious exposure to sexual objectification may be harmful to women, although perhaps not as acutely harmful as being directly objectified. However, given the much higher frequency of witnessed versus targeted objectification reported in all three samples, cumulative vicarious exposure to objectification may eventually take an emotional toll on women. Frequently witnessing sexual objectification of other women may serve as a reminder that such treatment is difficult to escape if one is female. However, the high prevalence of sexual objectification in women's daily lives may persist because while witnessing sexually objectifying treatment of others may evoke unpleasant emotions, it is often met with inaction (Cunningham, Miner, & Benavides-Espinoza, 2012).

Controlling for reactivity to daily stressors. To test the robustness of our within-person mediation findings and rule out alternate explanations, we conducted a number of additional analyses. In particular, because objectifying events may be more likely to occur in generally stressful contexts (e.g., being groped on a crowded train), we conducted additional analyses to investigate whether the emotional consequences of objectifying events were independent of reactivity to other daily stressors or hassles. When controlling for the emotional impact of daily stressors, the within-person indirect effects of objectifying events

on negative and self-conscious emotions were slightly attenuated, but remained reliably

positive. These findings suggest that the indirect emotional effects of exposure to sexual

objectification are largely independent of reactivity to other daily hassles.

   Establishing temporal precedence of objectifying events. Our main analyses were

conducted using measures of objectifying events, self-objectification, and emotions all

assessed at the same occasion (i.e., EMA survey). We used this approach because both events

and self-objectification were measured as occurring "since the last survey", and can therefore

be assumed to precede emotions, which were reported as "right now". However, this

approach does not guarantee that exposure to objectifying events preceded changes in self-

objectification. Thus, to test the theorised *objectifying event → self-objectification → emotion*

sequence, we repeated our main analyses using a "doubly-lagged" approach (see Figure S2

and Table S10 in the supplemental materials). Specifically, objectifying events reported as

occurring between t_0 and t_1 (Event$_{t0\text{-}t1}$) were included as predictors of self-objectification

between t_1 and t_2 (S-Obj$_{t1\text{-}t2}$), which predicted emotions at t_2 (Emotion$_{t2}$). In these analyses,

within-person indirect effects unexpectedly trended in a negative direction, due to the fact

that objectifying events predicted *decreases* in self-objectification at the next EMA survey.

Importantly, this inverse effect was only evident when statistically controlling for self-

objectification reported in the same time-interval as the objectifying events. In contrast, when

concurrent self-objectification was not included in these analyses, objectifying events no

longer predicted decreases in self-objectification measured at the next occasion (see Figure

S2 and Table S10 in supplemental materials for more detail).

   Considered together with our main analyses, which showed a positive

contemporaneous association between objectifying events and self-objectification (see a_W

paths in Table 3), these findings seem to suggest that self-objectification increases at the time

of exposure to objectifying events but then decreases relatively quickly (i.e., during the next

assessment period). While an alternative explanation for this negative effect might be that increases in self-objectification occur prior to sexually objectifying events, our additional analyses showing that self-objectification did not predict increased reporting of objectifying events at the next occasion (see Table S9 in supplemental materials) suggest otherwise. In sum, our findings indicate that exposure to sexually objectifying events in daily life predicts reliable yet transient increases in self-objectification, which lead to subsequent increases in negative and self-conscious emotions.

The above findings have important implications for understanding the psychological consequences of women's exposure to sexual objectification. On one hand, given the frequency of objectifying events in women's daily lives, even relatively transient increases in self-objectification—which appear to have adverse downstream emotional consequences— may be cumulatively harmful for women's well-being. On the other hand, the short-term psychological impact of sexually objectifying events may reflect that many women develop coping skills to minimize the harmful psychological consequences of objectifying events, rendering them relatively resilient to the effects of sexual objectification (Fredrickson & Roberts, 1997). For instance, adopting an accepting and compassionate attitude towards the self may buffer women against the harmful psychological effects of sexual objectification (Liss & Erchull, 2015).

Indirect effects of objectifying events on positive emotions

As predicted, and in contrast to our findings for negative and self-conscious emotions, we found no reliable evidence of within-person indirect effects of exposure to objectifying events (either as target or witness) on positive emotions. Thus, while state self-objectification may predict momentary increases in both negative and positive emotions, the indirect emotional consequences of exposure to objectifying events appear to be exclusively negative. Furthermore, at the between-person level, exposure to objectifying events was

indirectly associated with lower mean levels of positive emotions. Thus, women who reported more frequent exposure to objectifying events over the course of the study tended to report lower mean levels of positive emotions, and this association was statistically accounted for by their higher mean levels of self-objectification.

Direct effects of objectifying events on emotions

Finally, while the current study provides preliminary evidence that exposure to objectifying events indirectly results in reduced emotional well-being, we found no reliable evidence for the proposed direct pathway from objectifying events to reduced well-being, either within or between persons. Although this aligns with some previous research (e.g., Tiggemann & Williams, 2012), it contradicts findings from other studies (Prichard & Tiggemann, 2012).

Limitations and future directions

While the current study makes an important contribution to research on sexual objectification by providing the first test of Fredrickson and Roberts's (1997) hypothesized within-person process model, we wish to acknowledge several limitations.

First, the use of EMA (a self-report methodology) to measure exposure to objectifying events in daily life may be problematic for at least two reasons. Asking our participants to report sexually objectifying events in their daily lives may have inadvertently made them more vigilant or emotionally reactive to such behaviour. In addition, due to the subjective nature of self-reports, we cannot be certain that different participants interpreted sexually objectifying events in similar ways. Obtaining objective measures or peer-reports of exposure to objectifying events would circumvent both the potential measurement reactivity and inherent subjectivity of EMA. However, besides the difficulty of obtaining such data, there may be other reasons to consider self-reports a valid method for measuring exposure to objectifying events. First, mitigating concerns about potential measurement reactivity,

previous research demonstrates that whether or not women label events as "sexual harassment" does not influence the resulting psychological harm (Magley, Hulin, Fitzgerald, & DeNardo, 1999). Second, subjective appraisals of events, rather than their objective features, are thought to largely determine emotional responding (e.g., Lazarus, 1991). Thus, rather than abandoning self-report in favor of more objective assessment methods, future EMA research could include open-ended event descriptions and/or ratings of events on various appraisal dimensions (e.g., intensity, controllability) to obtain a richer qualitative understanding of the sexually objectifying events (and other daily hassles) that women encounter in their daily lives.

Second, consistent with early work on objectification (e.g., Fredrickson & Roberts, 1997; Kozee et al., 2007; Swim et al., 2001), we operationalised objectifying events relatively narrowly as sexualized perception or behaviors (e.g., ogling, catcalling, unwanted touching). More recently, researchers have begun to examine broader forms of objectification involving the perception or treatment of others in appearance-based or instrumental, but not necessarily sexual, ways (e.g., Loughnan, Haslam, Murnane, Vaes, Reynolds, & Suitner, 2010; Morris, Goldenberg, & Boyd, 2018). Yet, very little is known about the impact of being targeted by (or witnessing) different forms of objectification. Thus, future research should investigate the psychological consequences of exposure to a wider range of objectifying events in daily life beyond the sexually objectifying behaviors examined in the current study.

A third limitation of the current study is that our main findings supporting Fredrickson and Roberts's (1997) theorized within-person mediation model are based on analyses in which the predictor, mediator and outcome variables were assessed at the same measurement occasion. Our follow-up longitudinal mediation analyses suggest that the interval between EMA surveys in the current study (approx. 60-90 minutes) may have been

too long to detect the short-term lagged effect of objectifying events on self-objectification.

Choosing the most appropriate sampling frequency is a major challenge in EMA studies,

which can substantially influence the obtained results (Bolger & Laurenceau, 2013; Ebner-

Priemer & Sawitzki, 2007). We suggest that future studies should seek to replicate the current

findings using more intensive EMA sampling to capture the within-person process of

objectification at a more fine-grained timescale.

A fourth limitation relates to the participant samples recruited for the current study,

which comprised women from a fairly limited range of ages (~18-40 years old) and cultural

contexts (Australia and the USA). Although our samples were relatively diverse in terms of

their ethnic composition and relationship status, it will be important to explore how the

within-person process of sexual objectification plays out among women across the lifespan

living in a variety of cultural contexts. For instance, Fredrickson and Roberts's (1997)

objectification theory proposes that as women age they may be targeted by sexual

objectification less frequently and this may be accompanied by a reduced tendency to view

themselves in terms of their physical or sexual value to others, resulting in fewer harmful

psychological consequences. On the contrary, for women who have internalised the cultural

injunction to remain youthful and attractive as they age, the process of sexual objectification

may continue to exert harmful psychological consequences in later life (Fredrickson &

Roberts, 1997).

Finally, given our aim in the current study was to test a within-person mediation

model of sexual objectification proposed by Fredrickson and Roberts (1997), we focused

exclusively on estimating average within-person effects. However, future research should

explore potential moderators of each of the within-person paths tested in the current study.

For instance, previous research suggests that the within-person association between self-

objectification and emotional well-being may differ between individuals (Breines et al.,

2008). Thus, while we found that state self-objectification predicted increases in positive and negative emotions, on average, across three samples of young women, these effects may be moderated by individual differences in BMI, body dissatisfaction, feminist identification, or enjoyment of sexualization (Liss, Erchull, & Ramsay, 2011).

Despite the limitations noted above, we believe the current study makes an important contribution to the literature on sexual objectification by investigating the emotional consequences of "real-world" exposure to objectifying events. Furthermore, this study provides the first comprehensive test of Fredrickson and Roberts's (1997) theorized mediation model at both the within- and between-person levels. We hope this study provides an impetus for researchers to continue studying the intraindividual dynamics of sexual objectification in daily life and thereby to develop a richer understanding of its consequences for women's well-being.

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Supplemental Materials

Descriptive Statistics

Tables S1-S3 display descriptive statistics and reliabilities in each sample. Table S1

displays descriptive statistics for demographic variables in each sample.

Table S1

Demographic characteristics of Samples 1-3

Variable	Sample 1 ($n = 81$)[a]	Sample 2 ($n = 87$)[b]	Sample 3 ($n = 100$)[c]
Age			
Mean (*SD*)	22.33 (5.47)	23.52 (4.11)	26.46 (6.12)
Range	18–46	18–35	18–40
Ethnicity, *n* (%)			
White/Caucasian	38 (46.9%)	28 (32.2%)	65 (65.0%)
Asian	25 (30.9%)	33 (37.9%)	15 (15.0%)
South Asian	9 (11.1%)	10 (11.5%)	0 (0.0%)
Middle Eastern	2 (2.5%)	2 (2.3%)	0 (0.0%)
Indigenous	0 (0.0%)	0 (0.0%)	1 (1.0%)
Black/African	0 (0.0%)	0 (0.0%)	10 (10.0%)
Mixed ethnicity	4 (4.9%)	6 (6.9%)	8 (8.0%)
Other	3 (3.7%)	8 (9.2%)	1 (1.0%)
Country of birth, *n* (%)			
Australia	28 (34.6%)	28 (32.2)	1 (1.0%)
Malaysia	11 (13.6%)	10 (11.5)	0 (0.0%)
Singapore	7 (8.6%)	3 (3.4%)	0 (0.0%)
United Kingdom	7 (8.6%)	1 (1.1%)	0 (0.0%)
Sri Lanka	4 (4.9%)	0 (0.0%)	0 (0.0%)
China	3 (3.7%)	5 (5.7%)	2 (2.0%)
India	2 (2.5%)	10 (11.5%)	1 (1.0%)
Indonesia	2 (2.5%)	5 (5.7%)	0 (0.0%)
USA	2 (2.5%)	3 (3.4%)	89 (89.0%)
Other	15 (18.5%)	22 (25.3%)	7 (7.0%)
Sexual orientation, *n* (%)			
Heterosexual	74 (91.3%)	76 (87.4%)	69 (69.0%)
Homosexual	2 (2.5%)	1 (1.1%)	8 (8.0%)
Bisexual	5 (6.2%)	7 (8.0%)	18 (18.0%)
Other	0 (0.0%)	3 (3.4%)	5 (5.0%)
Relationship status, *n* (%)			
Single	52 (64.2%)	52 (59.8%)	37 (37.0%)
In a relationship (unmarried)	26 (32.1%)	27 (31.0%)	41 (41.0%)
Married	1 (1.2%)	7 (8.0%)	19 (19.0%)
Other	2 (2.5%)	1 (1.1%)	3 (3.0%)

Note. [a]Sample 1 data were collected in Australia in 2015.
[b]Sample 2 data were collected in Australia in 2016.
[c]Sample 3 data were collected in the USA in 2016-2017.

Table S2 displays descriptive statistics and reliability statistics for continuous

measures in each sample.

Table S2
Descriptive statistics and reliability estimates for continuous measures in Samples 1-3

Measure	Sample size		Mean	SD (% variance)		Cronbach's alpha	
	T	N		Within	Between	Within	Between
Negative Emotion							
Sample 1	4843	81	20.95 [17.98, 24.08]	12.95 (46%) [12.69, 13.2]	13.98 (54%) [11.83, 16.38]	0.62 [0.60, 0.64]	0.89 [0.85, 0.93]
Sample 2	5108	87	13.14 [10.40, 15.85]	12.07 (47%) [11.84, 12.31]	12.81 (53%) [10.99, 14.96]	0.61 [0.59, 0.62]	0.85 [0.79, 0.89]
Sample 3	5706	100	14.67 [12.12, 17.28]	11.85 (45%) [11.63, 12.08]	13.21 (55%) [11.48, 15.31]	0.62 [0.60, 0.63]	0.88 [0.84, 0.92]
Positive Emotion							
Sample 1	4839	81	59.33 [55.90, 62.87]	16.75 (53%) [16.40, 17.07]	15.88 (47%) [13.45, 18.64]	0.68 [0.66, 0.7]	0.93 [0.90, 0.96]
Sample 2	5096	87	56.77 [53.01, 60.34]	19.45 (56%) [19.07, 19.83]	17.30 (44%) [14.78, 20.15]	0.62 [0.6, 0.64]	0.84 [0.76, 0.9]
Sample 3	5699	100	61.63 [58.01, 65.38]	17.27 (46%) [16.95, 17.6]	18.80 (54%) [16.24, 21.64]	0.65 [0.63, 0.67]	0.93 [0.90, 0.96]
Self-Conscious Emotion							
Sample 1	4834	81	30.86 [26.62, 35.29]	20.80 (53%) [20.37, 21.2]	19.77 (47%) [16.87, 23.37]	—	—
Sample 2	5067	87	6.38 [4.23, 8.51]	12.15 (60%) [11.91, 12.39]	10.00 (40%) [8.55, 11.69]	0.69 [0.67, 0.71]	0.98 [0.97, 0.99]
Sample 3	5683	100	7.86 [5.79, 10.02]	11.37 (53%) [11.17, 11.59]	10.81 (48%) [9.35, 12.5]	0.66 [0.64, 0.68]	0.98 [0.97, 0.99]
Self-Objectification							
Sample 1	4822	81	34.40 [29.85, 39.07]	24.27 (57%) [23.79, 24.77]	20.93 (43%) [17.72, 24.59]	—	—
Sample 2	5050	87	21.42 [17.05, 25.65]	22.14 (55%) [21.70, 22.57]	20.17 (45%) [17.23, 23.46]	0.90 [0.89, 0.90]	0.99 [0.99, 1.00]
Sample 3	5659	100	23.15 [18.78, 27.72]	19.87 (43%) [19.51, 20.25]	22.82 (57%) [19.61, 26.21]	0.88 [0.87, 0.88]	0.99 [0.99, 1.00]

Note. T = number of occasions; N = number of participants.
95% Bayesian credible intervals are shown in square brackets below each estimate.
Cronbach's alphas for Self-Conscious Emotion and Self-Objectification were only calculated for Samples 2 and 3 because Sample 1 included only single-item measures.

Table S3 displays descriptive statistics for objectifying events in each sample.

Table S3
Frequencies of sexually objectifying events reported in Samples 1-3

	N	$N > 0$ (%)	Frequency			Proportion		
			Range	Median	Mean (*SD*)	Range	Median	Mean (*SD*)
Target								
Sample 1	81	61 (75%)	0–27	2.00	3.77 (5.41)	0.00–0.38	0.03	0.06 (0.09)
Sample 2	87	58 (67%)	0–17	1.00	2.26 (3.24)	0.00–0.30	0.02	0.04 (0.06)
Sample 3	100	58 (58%)	0–20	1.00	2.36 (3.95)	0.00–0.32	0.02	0.04 (0.07)
Witness								
Sample 1	81	71 (88%)	0–58	6.00	9.43 (10.77)	0.00–0.88	0.11	0.15 (0.17)
Sample 2	87	73 (84%)	0–58	3.00	7.85 (12.88)	0.00–1.00	0.07	0.14 (0.23)
Sample 3	100	83 (83%)	0–52	3.50	6.44 (9.30)	0.00–1.00	0.06	0.12 (0.18)

Note. $N > 0$ = number of participants who reported being targeted or witnessing sexually objectifying events at least once. Frequency = number of EMA surveys on which participants reported being targeted by or witnessing sexually objectifying events. Proportion = proportion of all EMA surveys on which participants reported being targeted by or witnessing sexually objectifying events.

Alternate Specifications of Multilevel Mediation Models

Models including sample dummy variables. Table S4 displays model fit statistics and estimates of within-person indirect effects from our original multilevel mediation models (for full results, see Table 3 in main text) and alternate models including dummy variables coding for differences between the three samples. Alternate models included dummy variables representing two out of the three samples (e.g., dummy variables for S2 and S3) and the third sample (e.g., S1) as the reference category, in which all random intercepts and slopes were regressed onto the dummy variables at the between-person level. For example, the models with S2 and S3 dummies tested whether the intercepts (representing mean levels of the predictor, mediator and outcome) and the slopes (representing the a, b and c' paths and autoregressive effects) differed in Samples 2 and 3 versus Sample 1. Estimates of the within-person indirect effects in Table S4 reflect the model predicted indirect effect for the reference category.

Table S4.

Model fit statistics and indirect effect estimates from multilevel mediation models with dummy variables representing differences across samples

| | | Predictor | | | | | |
| | | Target | | | Witness | | |
Outcome	Model	DIC	Indirect$_W$ (SD)	95% CI	DIC	Indirect$_W$ (SD)	95% CI
Negative Emotion	Original (Table 3 in main text)	492781.65	**0.43 (0.16)**	[0.13, 0.73]	503927.10	**0.19 (0.08)**	[0.03, 0.35]
	S2 & S3 dummies (Reference Category: S1)	492828.88	**0.47 (0.21)**	[0.08, 0.90]	504083.00	0.19 (0.11)	[–0.02, 0.40]
	S1 & S3 dummies (Reference Category: S2)	492828.58	**0.46 (0.22)**	[0.05, 0.92]	504082.59	**0.29 (0.12)**	[0.06, 0.54]
	S1 & S2 dummies (Reference Category: S3)	492831.24	0.32 (0.20)	[–0.07, 0.72]	504083.26	0.09 (0.10)	[–0.10, 0.28]
Self-Conscious Emotion	Original (Table 3 in main text)	504477.90	**1.74 (0.36)**	[1.06, 2.46]	515608.23	**0.52 (0.19)**	[0.16, 0.89]
	S2 & S3 dummies (Reference Category: S1)	504472.23	**3.61 (0.73)**	[2.18, 5.07]	515692.59	**1.11 (0.39)**	[0.36, 1.88]
	S1 & S3 dummies (Reference Category: S2)	504471.15	**0.75 (0.34)**	[0.14, 1.45]	515692.41	**0.39 (0.18)**	[0.06, 0.78]
	S1 & S2 dummies (Reference Category: S3)	504469.78	**0.65 (0.32)**	[0.03, 1.30]	515691.88	0.12 (0.15)	[–0.18, 0.41]
Positive Emotion	Original (Table 3 in main text)	515577.17	0.10 (0.23)	[–0.35, 0.55]	526542.16	0.06 (0.12)	[–0.18, 0.29]
	S2 & S3 dummies (Reference Category: S1)	515516.30	–0.01 (0.29)	[–0.59, 0.57]	526493.03	0.01 (0.14)	[–0.27, 0.29]
	S1 & S3 dummies (Reference Category: S2)	515516.20	0.31 (0.29)	[–0.25, 0.91]	526491.22	0.18 (0.16)	[–0.14, 0.50]
	S1 & S2 dummies (Reference Category: S3)	515516.28	0.09 (0.29)	[–0.48, 0.65]	526489.64	–0.02 (0.13)	[–0.28, 0.24]

Note. DIC = Deviance information criterion index of model fit; DIC values shaded in gray are the lowest (i.e. best fitting) within a set of nested models.
SD = posterior standard deviation.
CI = Bayesian credibility interval (highest posterior density).
Parameters in bold have 95% CIs that do not cross zero.

Results in Table S4 show that our original model specification (excluding dummy

variables) had the lowest DIC values (indicating the best model fit) for the models in which

Negative Emotion was predicted by Target and Witness and Self-Conscious Emotion was

predicted by Witness. This suggests that for these models, parameter estimates did not vary

substantially between samples. For the remaining three models (Self-Conscious Emotion

predicted by Target; Positive Emotion predicted by Target and Witness), one of the alternate

model specifications (including dummy variables) showed better model fit than our original

specification, as indicated by lower DIC values. This suggests that some of the model parameters varied meaningfully between samples. However, in these models the crucial within-person indirect effects were relatively similar across different model specifications. Specifically, although point estimates of within-person indirect effects varied across model specifications, their 95% CIs overlapped considerably. Furthermore, the indirect effect of Target on Self-Conscious Emotion had 95% CIs that consistently did not cross zero, whereas the indirect effect of Target and Witness on Positive Emotion had 95% CIs that consistently did cross zero in all model specifications.

Separate analyses for each sample. In addition, we re-ran all multilevel mediation analyses separately using data from each sample. Tables S5-S7 display results of these separate multilevel mediation models using data only from Samples 1-3, respectively.

Table S5
Results of multilevel Mediation Models Using Only Sample 1 Data

Outcome	Parameter	Target Estimate (SD)	Target 95% CI	Witness Estimate (SD)	Witness 95% CI
		Predictor			
		Target		*Witness*	
		Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	a_W	**12.36 (2.25)**	[7.85, 16.8]	**3.74 (1.42)**	[0.94, 6.51]
	b_W	**0.05 (0.01)**	[0.03, 0.07]	**0.04 (0.01)**	[0.02, 0.07]
	c'_W	0.35 (1.12)	[−1.88, 2.54]	0.50 (0.67)	[−0.75, 1.84]
	$cov(a_W, b_W)$	−0.20 (0.25)	[−0.70, 0.29]	−0.01 (0.13)	[−0.27, 0.26]
	$indirect_W$	0.38 (0.29)	[−0.16, 0.99]	0.15 (0.16)	[−0.17, 0.47]
	$total_W$	0.74 (1.11)	[−1.48, 2.91]	0.65 (0.69)	[−0.66, 2.06]
	Between-Person				
	a_B	−0.17 (0.30)	[−0.76, 0.43]	0.20 (0.15)	[−0.09, 0.49]
	b_B	**0.35 (0.07)**	[0.21, 0.48]	**0.36 (0.07)**	[0.22, 0.49]
	c'_B	−0.13 (0.17)	[−0.47, 0.20]	−0.05 (0.09)	[−0.23, 0.12]
	$indirect_B$	−0.06 (0.11)	[−0.28, 0.15]	0.07 (0.06)	[−0.03, 0.19]
	$total_B$	−0.19 (0.20)	[−0.58, 0.21]	0.02 (0.10)	[−0.18, 0.22]
Self-Conscious Emotion	Within-Person				
	a_W	**12.43 (2.29)**	[7.87, 16.87]	**3.72 (1.41)**	[1.00, 6.54]
	b_W	**0.30 (0.03)**	[0.25, 0.35]	**0.30 (0.03)**	[0.25, 0.35]
	c'_W	−0.60 (1.71)	[−4.08, 2.68]	0.30 (1.28)	[−2.25, 2.81]
	$cov(a_W, b_W)$	−0.07 (0.53)	[−1.12, 0.98]	−0.17 (0.35)	[−0.87, 0.54]
	$indirect_W$	**3.66 (0.99)**	[1.84, 5.74]	0.94 (0.57)	[−0.20, 2.07]
	$total_W$	3.07 (1.71)	[−0.30, 6.43]	1.24 (1.44)	[−1.46, 4.22]
	Between-Person				
	a_B	−0.18 (0.30)	[−0.76, 0.44]	0.20 (0.15)	[−0.10, 0.49]
	b_B	**0.70 (0.08)**	[0.55, 0.85]	**0.71 (0.08)**	[0.56, 0.86]
	c'_B	−0.10 (0.20)	[−0.48, 0.28]	−0.06 (0.10)	[−0.26, 0.13]
	$indirect_B$	−0.12 (0.21)	[−0.54, 0.30]	0.14 (0.11)	[−0.06, 0.36]
	$total_B$	−0.22 (0.28)	[−0.76, 0.36]	0.08 (0.14)	[−0.20, 0.36]
Positive Emotion	Within-Person				
	a_W	**12.07 (2.27)**	[7.63, 16.45]	**3.69 (1.40)**	[0.85, 6.38]
	b_W	0.01 (0.02)	[−0.02, 0.05]	0.02 (0.02)	[−0.02, 0.05]
	c'_W	2.37 (1.46)	[−0.58, 5.20]	−0.60 (0.84)	[−2.22, 1.05]
	$cov(a_W, b_W)$	0.18 (0.37)	[−0.57, 0.90]	−0.05 (0.22)	[−0.49, 0.37]
	$indirect_W$	0.32 (0.41)	[−0.48, 1.17]	0.01 (0.23)	[−0.46, 0.46]
	$total_W$	2.69 (1.46)	[−0.15, 5.60]	−0.58 (0.85)	[−2.25, 1.06]
	Between-Person				
	a_B	−0.16 (0.30)	[−0.74, 0.44]	0.20 (0.15)	[−0.10, 0.49]
	b_B	−0.06 (0.09)	[−0.23, 0.12]	−0.07 (0.09)	[−0.26, 0.10]
	c'_B	0.37 (0.22)	[−0.07, 0.81]	0.04 (0.12)	[−0.19, 0.27]
	$indirect_B$	0.00 (0.03)	[−0.06, 0.09]	−0.01 (0.03)	[−0.07, 0.03]
	$total_B$	0.38 (0.23)	[−0.05, 0.83]	0.02 (0.12)	[−0.21, 0.26]

Table S6

Results of multilevel Mediation Models Using Only Sample 2 Data

| Outcome | Parameter | Predictor | | | |
| | | Target | | Witness | |
		Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	a_W	**9.83 (2.49)**	[5.13, 14.90]	**4.56 (1.41)**	[1.82, 7.36]
	b_W	**0.06 (0.01)**	[0.03, 0.09]	**0.07 (0.01)**	[0.04, 0.09]
	c'_W	0.44 (1.51)	[−2.58, 3.39]	−0.16 (0.77)	[−1.62, 1.43]
	$cov(a_W, b_W)$	−0.38 (0.30)	[−0.99, 0.17]	−0.10 (0.17)	[−0.45, 0.23]
	$indirect_W$	0.21 (0.36)	[−0.49, 0.92]	0.19 (0.19)	[−0.19, 0.58]
	$total_W$	0.64 (1.52)	[−2.48, 3.51]	0.03 (0.78)	[−1.52, 1.53]
	Between-Person				
	a_B	**1.64 (0.46)**	[0.75, 2.55]	**0.23 (0.10)**	[0.04, 0.42]
	b_B	**0.17 (0.07)**	[0.03, 0.31]	**0.21 (0.07)**	[0.08, 0.34]
	c'_B	**0.79 (0.31)**	[0.16, 1.37]	**0.16 (0.06)**	[0.04, 0.27]
	$indirect_B$	**0.27 (0.14)**	[0.03, 0.56]	**0.05 (0.03)**	[0.00, 0.10]
	$total_B$	**1.07 (0.29)**	[0.50, 1.63]	**0.21 (0.06)**	[0.10, 0.33]
Self-Conscious Emotion	Within-Person				
	a_W	**9.87 (2.54)**	[4.90, 14.91]	**4.44 (1.41)**	[1.68, 7.18]
	b_W	**0.09 (0.02)**	[0.06, 0.13]	**0.10 (0.02)**	[0.06, 0.13]
	c'_W	1.54 (1.43)	[−1.35, 4.28]	−0.40 (0.84)	[−2.10, 1.22]
	$cov(a_W, b_W)$	−0.31 (0.48)	[−1.26, 0.61]	−0.17 (0.23)	[−0.62, 0.30]
	$indirect_W$	0.61 (0.57)	[−0.53, 1.74]	0.26 (0.27)	[−0.28, 0.78]
	$total_W$	2.13 (1.48)	[−0.74, 5.08]	−0.15 (0.85)	[−1.81, 1.53]
	Between-Person				
	a_B	**1.65 (0.46)**	[0.75, 2.54]	**0.24 (0.10)**	[0.05, 0.43]
	b_B	**0.22 (0.05)**	[0.12, 0.31]	**0.23 (0.04)**	[0.14, 0.32]
	c'_B	**0.54 (0.22)**	[0.11, 0.96]	**0.15 (0.04)**	[0.07, 0.22]
	$indirect_B$	**0.35 (0.13)**	[0.12, 0.61]	**0.05 (0.03)**	[0.01, 0.11]
	$total_B$	**0.89 (0.22)**	[0.47, 1.33]	**0.20 (0.04)**	[0.11, 0.29]
Positive Emotion	Within-Person				
	a_W	**9.88 (2.49)**	[5.01, 14.72]	**4.64 (1.42)**	[1.84, 7.42]
	b_W	**0.05 (0.02)**	[0.01, 0.10]	**0.05 (0.02)**	[0.00, 0.10]
	c'_W	−3.15 (2.31)	[−7.74, 1.38]	−0.51 (1.31)	[−3.07, 2.03]
	$cov(a_W, b_W)$	−0.15 (0.51)	[−1.15, 0.87]	0.02 (0.31)	[−0.61, 0.63]
	$indirect_W$	0.35 (0.57)	[−0.80, 1.47]	0.26 (0.33)	[−0.40, 0.93]
	$total_W$	−2.79 (2.31)	[−7.36, 1.80]	−0.26 (1.33)	[−2.92, 2.30]
	Between-Person				
	a_B	**1.64 (0.46)**	[0.75, 2.56]	**0.24 (0.10)**	[0.05, 0.43]
	b_B	0.04 (0.11)	[−0.17, 0.26]	0.09 (0.10)	[−0.10, 0.28]
	c'_B	−0.03 (0.48)	[−0.95, 0.91]	**−0.18 (0.09)**	[−0.35, −0.01]
	$indirect_B$	0.06 (0.19)	[−0.29, 0.47]	0.02 (0.03)	[−0.03, 0.08]

	$total_B$	0.04 (0.43)	[–0.85, 0.84]	–0.16 (0.09)	[–0.32, 0.01]

Note. CI = Bayesian credibility interval (highest posterior density); Parameters in bold have 95% CIs that do not cross zero. Estimates of all between-person paths (except path b_B) were divided by 100 so that 1 unit reflects a difference of 1% in prevalence of objectifying events.

Table S7

Results of multilevel Mediation Models Using Only Sample 3 Data

		Predictor			
		Target		Witness	
Outcome	Parameter	Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	a_W	**11.29 (2.51)**	[6.40, 16.2]	1.46 (1.29)	[–1.14, 3.90]
	b_W	**0.03 (0.01)**	[0.00, 0.06]	**0.04 (0.02)**	[0.01, 0.07]
	c'_W	2.75 (1.48)	[–0.21, 5.64]	–0.07 (0.67)	[–1.40, 1.20]
	$cov(a_W, b_W)$	0.23 (0.30)	[–0.34, 0.85]	0.14 (0.17)	[–0.20, 0.48]
	$indirect_W$	0.58 (0.34)	[–0.09, 1.25]	0.19 (0.18)	[–0.17, 0.55]
	$total_W$	**3.34 (1.53)**	[0.25, 6.31]	0.13 (0.68)	[–1.22, 1.44]
	Between-Person				
	a_B	**1.65 (0.36)**	[0.96, 2.38]	0.24 (0.13)	[–0.03, 0.49]
	b_B	**0.27 (0.06)**	[0.17, 0.38]	**0.34 (0.05)**	[0.24, 0.43]
	c'_B	**0.52 (0.21)**	[0.10, 0.93]	0.03 (0.06)	[–0.11, 0.15]
	$indirect_B$	**0.44 (0.13)**	[0.19, 0.71]	0.08 (0.05)	[–0.01, 0.17]
	$total_B$	**0.97 (0.21)**	[0.56, 1.39]	0.10 (0.08)	[–0.04, 0.26]
Self-Conscious Emotion	Within-Person				
	a_W	**10.88 (2.54)**	[5.84, 15.86]	1.34 (1.29)	[–1.21, 3.84]
	b_W	**0.06 (0.01)**	[0.03, 0.09]	**0.07 (0.01)**	[0.04, 0.10]
	c'_W	2.79 (1.59)	[–0.36, 5.85]	0.93 (0.76)	[–0.54, 2.40]
	$cov(a_W, b_W)$	0.14 (0.28)	[–0.40, 0.69]	0.23 (0.14)	[–0.03, 0.53]
	$indirect_W$	**0.80 (0.34)**	[0.17, 1.52]	0.33 (0.18)	[–0.02, 0.67]
	$total_W$	**3.60 (1.63)**	[0.38, 6.75]	1.25 (0.76)	[–0.23, 2.72]
	Between-Person				
	a_B	**1.64 (0.36)**	[0.92, 2.33]	0.23 (0.13)	[–0.03, 0.49]
	b_B	**0.19 (0.04)**	[0.10, 0.27]	**0.28 (0.04)**	[0.20, 0.36]
	c'_B	**0.75 (0.16)**	[0.45, 1.06]	0.05 (0.05)	[–0.06, 0.15]
	$indirect_B$	**0.29 (0.09)**	[0.13, 0.48]	0.06 (0.04)	[–0.01, 0.14]
	$total_B$	**1.05 (0.15)**	[0.74, 1.35]	0.11 (0.06)	[–0.01, 0.24]
Positive Emotion	Within-Person				
	a_W	**11.31 (2.42)**	[6.59, 16.11]	1.40 (1.31)	[–1.20, 3.98]
	b_W	0.03 (0.02)	[–0.01, 0.07]	0.03 (0.02)	[–0.01, 0.07]
	c'_W	1.57 (1.72)	[–1.78, 4.98]	1.13 (0.92)	[–0.70, 2.88]
	$cov(a_W, b_W)$	–0.74 (0.49)	[–1.76, 0.19]	–0.09 (0.24)	[–0.55, 0.4]
	$indirect_W$	–0.38 (0.52)	[–1.46, 0.61]	–0.04 (0.25)	[–0.53, 0.44]
	$total_W$	1.20 (1.76)	[–2.24, 4.70]	1.09 (0.93)	[–0.72, 2.92]
	Between-Person				
	a_B	**1.66 (0.36)**	[0.95, 2.38]	0.24 (0.13)	[–0.03, 0.49]
	b_B	–0.23 (0.10)	[–0.42, –0.05]	–0.25 (0.08)	[–0.42, –0.09]

c'_B	–0.12 (0.36)	[–0.83, 0.59]	0.04 (0.11)	[–0.17, 0.26]
$indirect_B$	**–0.37 (0.18)**	[–0.75, –0.04]	–0.05 (0.04)	[–0.15, 0.01]
$total_B$	–0.50 (0.33)	[–1.17, 0.12]	–0.02 (0.11)	[–0.24, 0.20]

Note. CI = Bayesian credibility interval (highest posterior density); Parameters in bold have 95% CIs that do not cross zero. Estimates of all between-person paths (except path b_B) were divided by 100 so that 1 unit reflects a difference of 1% in prevalence of objectifying events.

Controlling for the effects of other stressors. To investigate whether the indirect emotional impact of sexually objectifying events was independent of reactivity to other daily stressors, we ran additional analyses using data from Samples 2 and 3, in which self-objectification (mediator) and emotions (outcome) were simultaneously regressed onto objectifying events and other daily stressors/hassles.

Figure S1 shows the within-person model controlling for reactivity to other daily stressors/hassles (*Stress*). Here, both the proposed mediator (*S-Obj*) and outcome (*Emotion*) are regressed onto the occurrence of stressors/hassles (*Stress*), while also modeling the effect of objectifying events (*Event*). The random slopes $S1_{Wi}$ and $S2_{Wi}$ represent the effects of other stressors/hassles on Self-Objectification and Emotion, respectively.
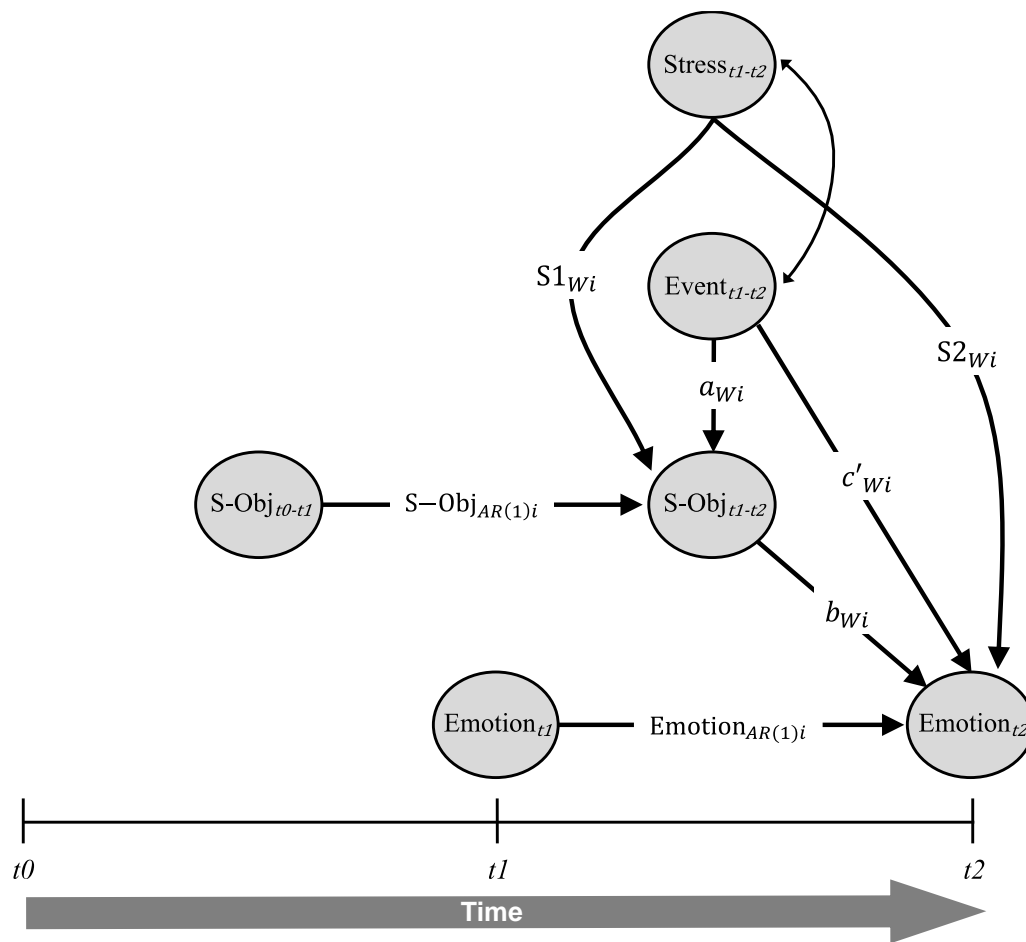
Figure S1. Within-person mediation model controlling for reactivity to other daily stressors/hassles. The double-headed arrow connecting stress and event represents a contemporaneous covariance between objectifying events and other daily stressors/hassles reported at the same EMA survey. Covariances between all random slopes were estimated between-persons, but are not shown above for simplicity.

Table S8 displays estimates of within-person effects from the multilevel mediation models controlling for reactivity to other daily stressors/hassles, using data from Samples 2 and 3 (see Figure S1 above for model diagram).

Table S8

Results of multilevel mediation models testing effects of exposure to sexually objectifying events on emotions via self-objectification, controlling for other daily stressors/hassles based on combined data from Samples 2 and 3

Outcome	Parameter	Predictor			
		Target		Witness	
		Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	$S1_W$	**2.06 (0.93)**	[0.19, 3.85]	**2.40 (0.93)**	[0.63, 4.27]
	$S2_W$	**10.30 (0.83)**	[8.69, 11.93]	**10.31 (0.82)**	[8.72, 11.94]
	a_W	**10.35 (1.69)**	[7.13, 13.80]	**2.97 (0.93)**	[1.14, 4.76]
	b_W	**0.04 (0.01)**	[0.02, 0.05]	**0.04 (0.01)**	[0.02, 0.06]
	c'_W	1.33 (0.97)	[–0.51, 3.29]	0.30 (0.46)	[–0.58, 1.24]
	$cov(a_W, b_W)$	–0.05 (0.16)	[–0.36, 0.26]	0.07 (0.09)	[–0.11, 0.26]
	$indirect_W$	0.33 (0.19)	[–0.03, 0.70]	**0.19 (0.10)**	[0.00, 0.40]
	$total_W$	1.67 (0.97)	[–0.25, 3.55]	0.49 (0.46)	[–0.39, 1.43]
Self-Conscious Emotion	Within–Person				
	$S1_W$	**2.23 (0.97)**	[0.31, 4.09]	**2.67 (0.95)**	[0.80, 4.52]
	$S2_W$	**4.92 (0.84)**	[3.27, 6.58]	**5.14 (0.85)**	[3.49, 6.82]
	a_W	**9.90 (1.69)**	[6.65, 13.24]	**2.87 (0.91)**	[1.10, 4.64]
	b_W	**0.07 (0.01)**	[0.05, 0.09]	**0.07 (0.01)**	[0.05, 0.09]
	c'_W	**2.18 (1.01)**	[0.19, 4.18]	0.47 (0.54)	[–0.64, 1.51]
	$cov(a_W, b_W)$	–0.03 (0.21)	[–0.44, 0.38]	0.14 (0.11)	[–0.08, 0.34]
	$indirect_W$	**0.63 (0.25)**	[0.15, 1.14]	**0.34 (0.13)**	[0.09, 0.59]
	$total_W$	**2.82 (1.03)**	[0.83, 4.90]	0.81 (0.54)	[–0.27, 1.85]
Positive Emotion	Within–Person				
	$S1_W$	**2.28 (0.97)**	[0.35, 4.16]	**2.68 (0.97)**	[0.80, 4.61]
	$S2_W$	**–10.97 (1.05)**	[–13.07, –8.98]	**–10.96 (1.05)**	[–13.01, –8.87]
	a_W	**10.37 (1.65)**	[7.21, 13.73]	**3.11 (0.94)**	[1.29, 4.97]
	b_W	**0.05 (0.02)**	[0.02, 0.08]	**0.05 (0.02)**	[0.02, 0.08]
	c'_W	0.04 (1.44)	[–2.82, 2.84]	–0.06 (0.73)	[–1.50, 1.38]
	$cov(a_W, b_W)$	–0.32 (0.28)	[–0.91, 0.19]	–0.03 (0.16)	[–0.37, 0.28]
	$indirect_W$	0.17 (0.31)	[–0.46, 0.76]	0.11 (0.17)	[–0.23, 0.44]
	$total_W$	0.20 (1.45)	[–2.76, 2.98]	0.05 (0.74)	[–1.39, 1.50]

Note. CI = Bayesian credibility interval (highest posterior density).

Parameters in bold have 95% CIs that do not cross zero.

$S1_W$ and $S2_W$ represent the within-person stressor reactivity slopes; i.e., the estimated effects of stressor occurrence on changes in state self-objectification and emotions, respectively.

Temporal precedence of objectifying events. Table S9 displays results of multilevel logistic regression models testing the within-person effect of self-objectification on subsequent reporting of sexually objectifying events. In each model, the probability of reporting a sexually objectifying event (as Target or Witness) between time *t1* and *t2* was predicted by level Self-Objectification during the same time interval (*t1* to *t2*) or in the previous time interval (*t0* to *t1*), while controlling for the occurrence of objectifying events in the previous interval (*t0* to *t1*). Results in Table S9 indicate that neither the contemporaneous nor cross-lagged effects of self-objectification on reporting of objectifying events was meaningfully different from zero.

Table S9
Results of multilevel models testing within-person effect of self-objectification as a predictor of exposure to sexually objectifying events

Outcome	Predictor	Estimate (*SD*)	95% CI
$Target_{t1-t2}$	$S\text{-}Obj_{t1-t2}$	0.006 (0.005)	[–0.004, 0.016]
	$Target_{t0-t1}$	–0.268 (0.284)	[–0.850, 0.271]
$Target_{t1-t2}$	$S\text{-}Obj_{t0-t1}$	–0.006 (0.005)	[–0.016, 0.005]
	$Target_{t0-t1}$	–0.130 (0.228)	[–0.612, 0.300]
$Witness_{t1-t2}$	$S\text{-}Obj_{t1-t2}$	–0.004 (0.005)	[–0.014, 0.005]
	$Witness_{t0-t1}$	**0.291 (0.086)**	[0.120, 0.459]
$Witness_{t1-t2}$	$S\text{-}Obj_{t0-t1}$	–0.006 (0.005)	[–0.015, 0.004]
	$Witness_{t0-t1}$	**0.286 (0.092)**	[0.101, 0.461]

"Doubly-lagged" mediation models. Although the analyses reported in Table S9 (above) do not suggest that increases in self-objectification predict subsequently increased reporting of sexually objectifying events, we sought to conclusively test our theorized causal sequence of objectifying events → self-objectification → emotion by repeating our main analyses with objectifying events assessed at the previous measurement occasion to self-objectification. Figure S2 displays the "doubly-lagged" within-person mediation model we

tested, in which objectifying events occurring between $t0$ and $t1$ were used to predict self-objectification in the interval between $t1$ and $t2$, which in turn predicted emotions at $t2$.
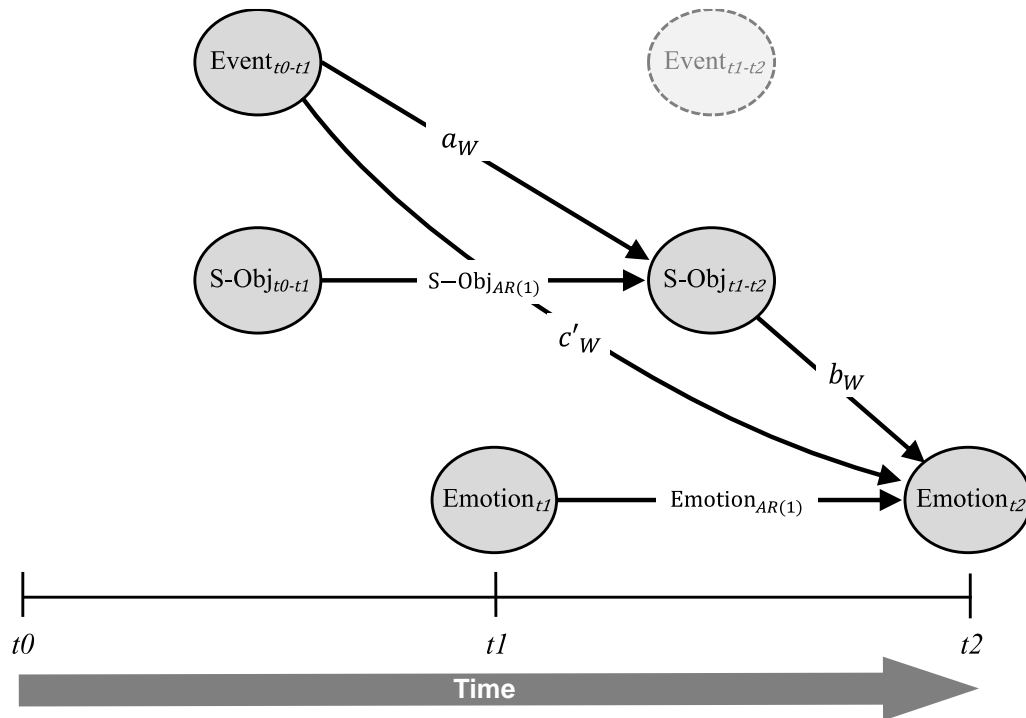
Figure S2. Doubly-lagged within-person mediation model tested. In this model, the predictor (Event$_{t0\text{-}t1}$) was measured at the previous occasion to the mediator (S-Obj$_{t1\text{-}t2}$). As in the main analyses, the outcome (Emotion$_{t2}$) and mediator (S-Obj$_{t1\text{-}t2}$) were measured at the same occasion ($t2$), but since the mediator was reported as "since the last survey" it is assumed to precede the outcome, which was measured as "right now". Covariances between all random slopes were estimated between-persons, but are not shown above for simplicity.

Estimates of the within-person effects from the doubly-lagged mediation models shown in Figure S2 are displayed in Table S10, below.

Table S10

Results of "doubly-lagged" multilevel mediation models

		Predictor			
		Target		Witness	
Outcome	Parameter	Estimate (*SD*)	95% CI	Estimate (*SD*)	95% CI
Negative Emotion	Within-Person				
	a_W	**–2.58 (1.09)**	[–4.74, –0.45]	**–1.70 (0.80)**	[–3.23, –0.10]
	b_W	**0.05 (0.01)**	[0.04, 0.06]	**0.05 (0.01)**	[0.03, 0.06]
	c'_W	–0.17 (0.69)	[–1.56, 1.14]	–0.68 (0.46)	[–1.59, 0.19]
	$cov(a_W, b_W)$	0.16 (0.10)	[–0.04, 0.37]	–0.06 (0.08)	[–0.22, 0.09]
	$indirect_W$	0.03 (0.11)	[–0.19, 0.26]	–0.14 (0.09)	[–0.31, 0.04]
	$total_W$	–0.14 (0.7)	[–1.51, 1.25]	–0.82 (0.48)	[–1.79, 0.07]
Self-Conscious Emotion	Within-Person				
	a_W	**–2.31 (1.13)**	[–4.64, –0.23]	–1.49 (0.82)	[–3.13, 0.07]
	b_W	**0.16 (0.01)**	[0.14, 0.19]	**0.16 (0.01)**	[0.13, 0.18]
	c'_W	0.17 (1.10)	[–2.16, 2.15]	–0.57 (0.56)	[–1.70, 0.51]
	$cov(a_W, b_W)$	0.16 (0.21)	[–0.25, 0.58]	–0.11 (0.15)	[–0.42, 0.19]
	$indirect_W$	–0.21 (0.28)	[–0.78, 0.33]	–0.34 (0.19)	[–0.70, 0.04]
	$total_W$	–0.04 (1.09)	[–2.20, 2.07]	–0.90 (0.64)	[–2.16, 0.36]
Positive Emotion	Within-Person				
	a_W	–2.05 (1.10)	[–4.18, 0.07]	–1.46 (0.81)	[–3.02, 0.15]
	b_W	**0.03 (0.01)**	[0.01, 0.05]	**0.03 (0.01)**	[0.01, 0.05]
	c'_W	1.53 (1.02)	[–0.41, 3.55]	0.45 (0.55)	[–0.64, 1.52]
	$cov(a_W, b_W)$	–0.42 (0.17)	[–0.77, –0.12]	–0.09 (0.13)	[–0.34, 0.15]
	$indirect_W$	**–0.48 (0.17)**	[–0.85, –0.18]	–0.14 (0.13)	[–0.38, 0.12]
	$total_W$	1.03 (1.02)	[–0.95, 3.04]	0.32 (0.56)	[–0.82, 1.37]

Note. CI = Bayesian credibility interval (highest posterior density); Parameters in bold have 95% CIs that do not cross zero.

Estimates of within-person indirect effects in Table S10 were not consistent with our main analyses, and trended in a negative direction (with a 95% CI for the indirect effect of Target on Positive Emotion not crossing zero). This is due to the fact that the a_W paths became negative when regressing self-objectification onto lagged objectifying events, suggesting that exposure to objectifying events may predict decreases in self-objectification

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at the subsequent time-interval. One plausible explanation for these findings, which go in the opposite direction to estimates of a*w* paths in our main analyses (see Table 3 in main text), is that self-objectification may increase momentarily in the period immediately following exposure to sexually objectifying events, but may subsequently decrease due to self-regulatory processes. Such momentary increases may be too brief to capture as lagged effects when successive measurement occasions (i.e., EMA surveys) are approximately 60-90 min apart, as in the current study. When controlling for self-objectification during the same time-interval as exposure to objectifying events (see model diagram in Figure S2), objectifying events may predict decreases in self-objectification in subsequent time-intervals as momentary increases in self-objectification tend to "return to baseline". In line with this reasoning, when we repeated the analyses without controlling for self-objectification reported between *t0* and *t1*, exposure to events was again positively (although less strongly) associated with self-objectification in the following time interval (*t1* to *t2*). This is actually consistent with the results of our main analyses (see Table 3 in main text), wherein the contemporaneous a*w* path was positive and the autoregressive path for self-objectification was also positive, implying an overall positive relationship among past objectifying events and future self-objectification (in our main analyses this is an indirect path).