Johnson, B. K., & Knobloch-Westerwick, S. (2017). When misery avoids company: Selective social comparisons to photographic online profiles. *Human Communication Research*, *43,* 54-75.

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When Misery Avoids Company:

Selective Social Comparisons to Photographic Online Profiles

Abstract

Social networking site usage may affect subjective well-being. Two experiments examined

how selective exposure to profiles of other users facilitated mood management via self-

enhancing social comparisons. In Study 1, when given detailed impression management cues,

such as photographs and status updates, users in a negative mood sought upward rather than

downward social comparisons. Study 2 found that relatively low levels of group

identification with the SNS community led to upward social comparisons by users in a

negative mood. High group identifiers spent more time viewing upward comparisons,

regardless of mood. Regarding exposure effects, upward social comparisons to profiles

improved subsequent mood when the comparison involved career success. High group

identifiers experienced greater positive mood following upward social comparisons.

Keywords: social networking site, social comparison, mood management, selective

exposure, online cues

When Misery Avoids Company:

Selective Social Comparisons to Photographic Online Profiles

Social networking sites such as Facebook, Twitter, LinkedIn, and Instagram are

making us sad, according to some reports from the press and researchers (e.g., Kross et al.,

2013; Mullins, 2014). Yet, if these sites are producing dysfunctional outcomes for subjective

well-being, why are they so popular and engaging for such a large number of users? After all,

over 70% of online adults in the U.S. make use of SNSs, 42% are engaged with multiple

sites, and nearly two-thirds are daily users (Duggan & Smith, 2013; Nielsen, 2014). Each

month, a typical user of the most popular SNS, Facebook, spends 6.5 hours accessing the

service via computer and 7.75 hours via smartphone app (Nielsen, 2014).

Recent studies (Chou & Edge, 2012; Feinstein et al., 2013) suggested that social

comparisons via social networking sites (SNSs) harm subjective well-being, because online

peers engage in self-serving self-presentation (Walther, 1996) that is insufficiently discounted

when comparing one's self to others. However, this work has largely relied on cross-sectional

survey data that cannot establish causality between social media use and well-being and that

has often used imprecise and confounded measures of SNS activities.

The present investigation attempts to replicate and extend previous evidence (Johnson

& Knobloch-Westerwick, 2014) of self-enhancing selective social comparisons among users

of SNSs. The primary focus is on selection of social comparisons, with a secondary focus on

their effects. In particular, we draw from the selective exposure self- and affect-management

(SESAM) model (Knobloch-Westerwick, 2015) and the identification-contrast model (Buunk

& Ybema, 1997) to argue that social comparison targets are selected because of their

expected effects, and that comparisons based on concrete versus abstract information produce

particular patterns of selections and effects. Two experiments are reported that considered the

effect of vivid social cues on selective social comparisons, the role of group identification,

and the post-comparison consequences for self-esteem and mood. First, however, the

relevance of social networking sites for social comparison phenomena is outlined.

Social Comparisons on Social Networking Sites

People have a propensity to compare themselves to others in their social environment,

for purposes of self-evaluation, self-improvement, or self-enhancement (Corcoran, Crusius,

& Mussweiler, 2011). Upward social comparisons are made with people perceived to be

superior on a relevant dimension of performance (Buunk & Ybema, 2003). In contrast,

downward social comparisons, to those less fortunate or successful, are sought out for their

potential for self-enhancement (Wills, 1981). Social comparisons are also made with

mediated depictions of others (Knobloch-Westerwick & Westerwick, 2011); this practice is

known to aid mood management (Knobloch & Zillmann, 2003; Mares & Cantor, 1992).

Social networking sites feature interpersonal connections with whom individuals are

typically well acquainted, maximizing the ease of making social comparisons with others.

The SNS environment is fertile for drawing social comparisons; Facebook users, for

example, have $M = 338$ and $Mdn = 200$ "friends," or connections, on the site (Smith, 2014).

This situation provides ample opportunity for upward and downward social comparisons to

similar others on a multitude of dimensions, and especially for exercising selectivity in those

social comparisons. Furthermore, SNSs allow for lateral surveillance of others, creating a

private mode of comparison that is expected to heighten comparison tendencies (Buunk &

Ybema, 1997). This potential for selectivity allows individuals to make motivated choices in

media exposure that can regulate mood and the self-concept (Knobloch-Westerwick, 2015).

An experiment by Haferkamp and Krämer (2011) presented participants with an SNS

profile constituting either an upward or downward comparison, and found that downward

comparisons enhanced self-evaluation and—for physical appearance comparisons—produced

positive mood. SNS users were also shown to exercise selectivity in their social comparisons,

based on their mood, in a study by Johnson and Knobloch-Westerwick (2014): While upward social comparisons were generally preferred over downward comparisons, more time was spent viewing downward comparisons among those induced into a negative mood compared to a positive mood. However, this experiment relied on aggregated cues such as ratings to indicate the relative attractiveness or career success of SNS profile owners, rather than using vivid cues such as photographs. The results did demonstrate, however, that SNS users exercised selective exposure to manage moods via social comparison.

In contrast, survey research showing relationships between SNS social comparisons and deleterious outcomes has inferred that comparisons diminish well-being. Chou and Edge (2012) found links between time spent on Facebook and misperceptions of others as being happier and more successful. A cross-sectional survey by Lee (2014) found that both SNS social comparison frequency and negative emotion following comparisons were correlated negatively with self-certainty and self-esteem. However, the relative directions of social comparisons were not assessed. Other authors demonstrated links between social comparison and depression with panel data, yet relied on measures that confounded social comparisons with their emotional effects (Feinstein et al., 2013; Steers, Wickham, & Acitelli, 2014). It is therefore critical to measure SNS social comparisons with other, valid and precise measures, such as unobtrusive observation, and to assess the consequences of those selective social comparisons for well-being outcomes such as mood and self-esteem.

The present investigation attempted to directly replicate and extend earlier findings that demonstrated selective social comparisons on SNSs (Johnson & Knobloch-Westerwick, 2014) by using the same procedure but a greater number of interpersonal cues added, including vivid cues, that have the potential to augment effects or activate distinct processes for mood management, as articulated below. The first study was an experiment that examined the effect of these cues on social comparisons in an ecologically valid SNS browsing context.

A second study examined group identification as a moderator of selective social comparisons, and tested the consequences of SNS social comparisons on mood and self-esteem.

Study 1

SNS Photographs and Social Comparisons

Computer-mediated communication (CMC) platforms such as SNS have become more technologically sophisticated over time, increasingly making use of rich media such as photos, video, and avatars in addition to the textual interaction that characterized early CMC (Van Der Heide, D'Angelo, & Schumaker, 2012; Walther, Slovacek, & Tidwell, 2001). The introduction of more vivid CMC cues such as profile photographs and real names has been shown to increase social presence (Feng, Li, & Li, 2016). There is also evidence of a visual primacy effect in online impression formation (Van Der Heide et al., 2012). Therefore, photographs and other vivid cues such as personalized self-disclosure that are detailed and complex (cf. Walther, 2007) should heighten social presence (Feng et al., 2016) and thus strengthen the pattern of social comparisons seen based on simple numeric cues such as ratings (cf. Johnson & Knobloch-Westerwick, 2014). Thus, we would expect to replicate two findings of that previous study of selective social comparisons on social networking sites.

H1: Individuals spend more time browsing profiles featuring upward social comparisons than those featuring downward social comparisons.

H2: Individuals in a negative mood spend more time browsing profiles with downward social comparisons, and less time browsing profiles with upward social comparisons, than do those individuals in a positive mood.

However, additional perspectives from CMC and social comparison theories suggest that richer media and the use of numerous, vivid cues may produce different social comparisons processes than do simpler, leaner cues such as text or reputation scores. The hyperpersonal model (Walther, 1996) posits that fewer, or less concrete, mediated social cues

will form strong yet idealized impressions. The identification-contrast model of social comparison (Buunk & Ybema, 1997; cf. Taylor & Lobel, 1989) posits that fewer, or less concrete, social cues facilitate social comparisons that involve contrast (seeing others worse or better off as very different than oneself) rather than assimilation (i.e., perceived similarity) with the comparison target. Together, these perspectives lead us to develop a different prediction that opposes H2.

Although the presence of photographs and other information-rich cues in computer-mediated communication can heighten social attraction and presence in the short term, it can harm attraction in the long run, because more concrete cues such as images hinder idealized impression formation (Walther et al., 2001). Indeed, CMC channels with more cues, including vivid cues (e.g., video), produce less positive peer evaluations (Nowak, Watt, & Walther, 2005). Vividness refers to stimulus properties perceived as concrete, proximate, and emotionally engaging (Nisbett & Ross, 1980). Text may also be perceived as vivid to the extent that it embodies these characteristics (e.g., Bakke, 2010; Douglas & McGarty, 2001).

An idealization process in the absence of vivid or complex cues allows for the formation of decisive yet abstracted *hyperpersonal* computer-mediated impressions (Walther, 1996). When people are motivated to engage in self-enhancing social comparisons, downward comparisons may be unpleasant because of their negative tone; however, this is often rectified by making downward comparisons with imagined or highly abstract others, rather than vivid cases (Taylor & Lobel, 1989). In the same way, hyperpersonal judgments in the CMC context may allow for self-enhancing social comparisons via media that do not involve vivid cues and detailed information—without the risk of adverse effects from emotional contagion (i.e., interpersonal transmission of affect; Hatfield, Cacioppo, & Rapson, 1993) due to contact with negative or unpleasant depictions. Similarly, upward comparisons to others evaluated via idealized, hyperpersonal judgments could be even more threatening

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than those where judgments were based on vivid or detailed cues about the person. This

proposition is supported by the finding that having a greater number of strangers (thus

abstracted others) as SNS connections was associated with more positive evaluations of

others and deflated self-evaluations (Chou & Edge, 2012).

Moreover, in addition to being less prone to generating hyperpersonal perceptions,

rich media (e.g., those using visual depictions or extensive personal details) for upward

targets have the benefit of being inherently pleasant. Upward comparisons may be sought for

their positive emotional contagion potential, and they are also more desirable and beneficial

when assimilation (i.e., perceived closeness and similarity) occurs with the target (Taylor &

Lobel, 1989), as this minimizes contrast between the comparer and the target. Vivid cues

such as photographs, as well as detailed textual self-disclosure, might allow for greater initial

assimilation than abstract information such as ratings (Walther et al., 2001).

Buunk and Ybema (1997) proposed an identification-contrast model of social

comparison that could explain both the selection of comparisons targets and consequences of

these comparisons. In addition to specifying that if the individual is in a state of threat or

negative affect, social comparisons will be chosen if they allow for upward identification

(i.e., assimilation) or downward contrast, the model also stipulates that "when information

about the *scores* of others is obtained, most subjects may have a better opportunity to contrast

themselves with these others, whereas *vivid information* about or *contact* with others in a

similar situation may more often evoke identification with them" (Buunk & Ybema, 1997, p.

371, emphasis in original). More concrete, intimate contact (i.e., vivid social targets) will thus

produce different patterns of selective social comparison than abstracted, imagined others.

This differentiation suggests that, in CMC settings, the richness and detail of the

depiction is critical for how social comparisons are sought out to boost mood and self-

esteem: only presenting low-bandwidth cues that provide scores and ratings or that allow for

idealization would facilitate contrast-based downward social comparisons (e.g., gamified

leaderboards; Christy & Fox, 2014), whereas high-bandwidth cues would facilitate

assimilation-based upward social comparisons.

In other words, SNS users wishing to manage their moods and self-concepts are likely

to seek (a) downward contrast in a context with few cues or (b) via upward assimilation in a

cue-abundant context. One explanation for these patterns is that emotional contagion is more

likely to occur in contexts with vivid or multiple cues. Emotional contagion is a process in

which affect, whether positive or negative, spreads interpersonally in automatic fashion

(Buunk & Ybema, 1997, 2003) and has been shown to occur even via valenced text

exchanges in CMC and SNS (Guillory et al., 2011; Kramer, Guillory, & Hancock, 2014).

Therefore, given the tenets of the SESAM (Knobloch-Westerwick, 2015), the

identification-contrast model of social comparison (Buunk & Ybema, 1997), and work on

hyperpersonal evaluations and emotional contagion in computer-mediated communication,

we propose the following hypothesis, in contrast to the prediction made in H2 above.

H3: In a cue-abundant SNS context, individuals in a negative mood spend more time

browsing profiles with upward social comparisons, and less time browsing profiles

with downward social comparisons, than individuals in a positive mood.

Method

Overview. After being induced into either a negative or positive mood, male and

female participants (2x2 mood x sex between-subjects factors) were presented with a website

that approximated the look and feel of a social networking site. The website presented profile

content manipulated to represent 2x2 (career success x physical attractiveness) within-

subjects factors. Over a 3-minute browsing period, software unobtrusively measured time

spent viewing individual profile pages, to provide a highly valid selective exposure measure.

Short questionnaires preceded and followed browsing sessions.

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Participants. Students ($N = 174$) were recruited from a participant pool at a large university in the Midwestern United States. The sample was $M_{age} = 19.59$, $SD = 2.16$; 67.2% female; 61.8% White, 26.0% Asian, 4.6% Black, 1.7% Hispanic, and 5.8% other.

Procedure. The study carefully matched the same conditions and procedure as Johnson and Knobloch-Westerwick (2014), only with the addition of more cues by which comparison could be made: both the sheer number of cues as well as the vividness of cues. Participants were recruited to attend a study, ostensibly regarding "facial expression recognition" in a computer laboratory with private workstations. That study was actually a randomized induction of mood via false feedback, a well-validated technique in the mood management literature (e.g., Reinecke et al., 2012; Zillmann, Hezel, & Medoff, 1980). Participants categorized varied facial expressions, and were given continuous feedback by the computer: either a 15% success rate, labeled "Terrible," or an 85% success rate, "Excellent."

Afterward, participants were presented a second, supposedly unrelated study, which involved browsing and evaluating a prototype for a university alumni website. After an pre-exposure questionnaire that measured media use and demographics, the *SocialLink* website loaded and participants were asked to "examine it, browse through it, and read whatever you finding interesting." During this time, participants freely browsed the site, and their selective exposure to individual pages was measured by the site software, programmed in Microsoft Silverlight. After 3 min, a post-exposure questionnaire loaded, followed by debriefing.

Stimuli. To add a greater number of cues, including concrete visual and textual cues, for social comparison on the dimensions of career success and physical appearance to the stimuli used by Johnson and Knobloch-Westerwick (2014), several elements were designed or selected: status updates, job titles, and photographs. Status updates were written to resemble typical SNS updates by young adults, and to reflect low or high performance on each dimension. A total of 48 status updates were generated, with 12 written for each

manipulation (in a high vs. low career X high vs. low appearance crossed design). For

example, a high career success status update was "It's so good to come home from work

every day and feel like I have made a difference in the world. If that doesn't make you feel

proud, what would?" and a low physical attractiveness update was "Hey, I know I'm not the

best-looking person in the world, but c'mon! Show me a little love. People these days can

really be so shallow, am I right? WTH." Eight job titles (e.g., "Line Cook at Taco Bell" vs.

"Brand Manager at Nike, Inc.") were also generated to indicate low or high career success.

Finally, following previous research (Haferkamp & Krämer, 2011; Walther, Van Der Heide,

Kim, Westerman, & Tong, 2008), male and female photos, diverging on physical

attractiveness, were culled from photo rating sites (e.g., www.hotornot.com).

To pretest these elements, a survey of separate participants from the study population

(N = 75; 52.0% women; 81.3% White; M_{age} = 21.95, SD = 3.56) rated stimuli components on

task and physical attractiveness on four 7-point items (adopted from McCroskey & McCain,

1974). Status updates had the desired effect on task attractiveness, $F(1, 72)$ = 468.89, p <

.001, η_p^2 = .87, all desired Sidak pairwise comparisons p < .001, and on physical

attractiveness, $F(1, 73)$ = 114.84, p < .001, η_p^2 = .61, all but four desired pairwise

comparisons p < .05. Next, job titles had the desired impact on task attractiveness, $F(1, 73)$ =

312.66, p < .001, η_p^2 = .81, all desired pairwise comparisons p < .05. Finally, as expected,

there was a strong manipulation effect for photos on physical attractiveness, $F(1, 73)$ =

343.37, p < .001, η_p^2 = .82, with the desired pairwise differences.

These profile elements were then incorporated into a stimulus website (*SocialLink*)

designed to resemble popular social networking sites. This site also retained numeric cues (5-

point aggregate ratings) used to signal career success and physical attractiveness (in the same

2x2 crossed within-subjects design described above; Johnson & Knobloch-Westerwick,

2014). Profiles were awarded either .5 or 4.5 "dollar signs" to indicate low or high peer

ratings on success, and either .5 or 4.5 "hearts" to indicate low or high peer ratings on

attractiveness. So, in addition to these composite ratings, the same low or high performance

on these dimensions was also conveyed with photos (for physical appearance), job

descriptions (for career status), and status updates (for both appearance and career). The site

featured an overview page, which provided previews of eight different social networking site

profiles (e.g., Figure 1). The previews featured a name, photograph, job description, ratings

of success and attractiveness, and information about number of friends and when the

individual joined the site. All participants saw previews of and could access the same eight

profiles, except that images and names were assigned to be the same sex as the participant.

These eight previews were each linked to individual profile pages, which presented a

feed of status updates that matched the manipulations of photograph, job, and numeric cues.

Specifically, each profile featured two status updates about career success (whether low or

high) and two updates regarding attractiveness (low or high), as well as two distractor

updates pretested as mundane (from Johnson & Knobloch-Westerwick, 2014).

Profiles were thus manipulated with multiple, consistent cues to have either (a) high

career success or (b) low career success, and either (c) high physical attractiveness or (d) low

physical attractiveness, in a 2x2 within-subjects design. The stimuli featured eight profiles in

total: two profiles that embodied each possible combination of the 2x2 manipulations.

Participants were free to view as many profiles as they wished; these choices were measured

as selective exposure to the social comparison targets, as described next.

Selective exposure measures. During 3 min of browsing, hyperlink clicks were

logged, providing unobtrusive measurement of the time spent on the overview and on each

profile. Participants viewed $M = 5.46$ ($SD = 2.05$) of the eight profiles, indicating that the

limited browsing time allowed for exercising selectivity. The average profile was viewed for

$M = 15.69$ s ($SD = 3.67$). The mood manipulation affected time spent on the overview page,

$F(1, 172) = 3.89$, $p = .05$, $\eta_p^2 = .02$, where those in a negative mood viewed it longer, $M = 58.88$ s, $SD = 33.31$, than those in a positive mood, $M = 50.19$ s, $SD = 24.24$. Hence, time browsing the overview page was accounted for as a possible confound in hypotheses testing.

Selective exposure to upward and downward targets on the two comparison dimensions was computed by summing the time spent on profiles receiving the same manipulations, resulting in measures of selective exposure to (a) high career success, (b) low career success, (c) high physical attractiveness, and (d) low physical attractiveness profiles.

Results

A mixed-model ANOVA was conducted to test the effect of mood on selective exposure to downward and upward characteristics of social comparison targets. Direction of comparison and dimension of comparison were within-subjects experimental factors in a 2x2 design, while mood condition and sex were additional 2x2 between-subjects factors.

There was a main effect of comparison direction, $F(1, 170) = 69.82$, $p < .001$, $\eta_p^2 = .29$, where more time was generally spent with upward comparisons, $M = 74.84$ s, $SE = 2.05$, than downward comparisons, $M = 48.98$, $SE = 1.81$. This effect of comparison direction was moderated by mood in a significant interaction, $F(1, 170) = 5.47$, $p = .02$, $\eta_p^2 = .03$. There was less time spent with downward comparisons in a negative mood, $M = 42.69$, $SE = 2.58$, than positive mood, $M = 55.28$, $SE = 2.54$, a significant difference, $p < .001$. Similar amounts of time were spent on upward comparisons in negative, $M = 75.79$, $SE = 2.92$, and positive moods, $M = 73.90$, $SE = 2.88$, $p = .65$ (Figure 2).

Participant sex did not moderate social comparison direction, $p = .71$, or the condition by direction interaction, $p = .16$, nor did comparison dimension moderate direction, $p = .45$, or the mood by direction interaction, $p = .51$. A follow-up ANCOVA added time on overview page, age, daily Internet time, and daily SNS time as covariates, yet the mood by social comparison direction interaction was undiminished, $F(1, 165) = 7.22$, $p = .008$, $\eta_p^2 = .04$.

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Discussion

After being induced into negative or positive moods, participants spent three minutes browsing SNS profiles featuring multiple and vivid cues such as photographs, job descriptions, and status updates, which allowed for social comparisons. Browsing behavior was unobtrusively measured to capture selective social comparisons to profiles that had been manipulated in a within-subjects design. Overall, upward comparisons were preferred, supporting H1.

Hypothesis 2 was not supported, as it predicted negative mood would drive self-enhancing downward social comparisons (Wills, 1981) as had been seen in an earlier study with simple cues (Johnson & Knobloch-Westerwick, 2014). Instead, participants in a negative mood avoided downward comparisons and maintained a high level of browsing time devoted to upward comparison targets. This result supports H3, derived from the identification-contrast model (Buunk & Ybema, 1997), predicting that the presence of vivid cues would encourage upward comparisons to repair mood through emotional contagion and assimilation rather than downward contrast. Further, this pattern emerged both for the physical appearance dimension of the profile pages, which had been manipulated via photographs, updates, and ratings, and for the career success dimension, manipulated via job titles, updates, and ratings.

Given that the results supported the identification-contrast model (Buunk & Ybema, 1997) rather than Wills' (1981) downward social comparison model, a second study was conducted to further investigate the role of assimilation with the social comparison targets. Specifically, the role of group identification was examined, since the premise of the experimental design was that the SNS featured alumni of the university where the study was conducted. Additionally, the study design was extended to test effects of social comparison, by measuring post-exposure differences between participants in mood and self-esteem.

Study 2

The results from Study 1 demonstrated that a rich setting of multiple, detailed cues for impression formation produced a different pattern of self-enhancement via selective social comparison than did the same scenario with only simple aggregated ratings (Johnson & Knobloch-Westerwick, 2014). The presence of multiple, vivid cues appeared to allow for upward assimilation (Buunk & Ybema, 1997), serving emotional contagion and mood repair.

Yet, before assessing the potential consequences of SNS social comparisons, Study 1 requires reconciliation with results from Haferkamp and Krämer (2011). They used a forced-exposure design in which a single SNS profile was presented, also featuring the cues of photo and job title. In that study, downward comparison, relative to upward comparison, produced positive effects on mood and self-evaluation. However, mood was not induced as an initial motivation and participants were not given choice in browsing multiple profiles. Additionally, the study did not employ a premise such as an alumni SNS, so perhaps there was insufficient opportunity for assimilation. To address these issues, Study 2 included group identification as a moderating factor. Further, it examined outcomes of selective social comparisons on mood and self-esteem.

The Role of Group Identification

Group identification has been shown to provide a context of assimilation with upward comparisons and contrast with downward comparisons that moderated effects of self-enhancing social comparisons (Blanton, Crocker, & Miller, 2000). With regard to mediated social comparisons, studies have shown media users in need of self-enhancement favored downward out-group comparisons (Knobloch-Westerwick & Hastall, 2010) or downward in-group comparisons (Knobloch & Zillmann, 2003). In a study of selective exposure to online news depictions of other women, stay-at-home mothers and childfree working women (both numerical minorities) strongly favored positive depictions related to their own in-group,

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while working mothers (numerical majority) avoided upward comparisons to other, similar

women (Knobloch-Westerwick & Westerwick, 2011). This emphasis on similarity and group

distinctiveness is even more critical in SNSs, which feature people across social contexts

(e.g., Choi & Bazarova, 2015).

In the current situation, where SNS users appeared to employ upward comparisons to

vivid profile content for their emotional-contagion potential, it is less clear how group

identification might moderate the effects. The study population (university students) is

nominally affiliated with the comparison targets (alumni), but the level of group

identification is likely to vary. Given the general tendency to assimilate upwards, and an

avoidance of downward comparison targets when in a negative mood, group identification

might moderate self-enhancing social comparisons to heighten the effect of mood as

predicted in H3. Hence, we predicting the following.

> H4a: Individuals in a negative mood spend more time browsing profiles with upward
>
> social comparisons, and less time browsing profiles with downward social
>
> comparisons, compared to individuals in a positive mood, *in particular when their*
>
> *group identification is high*.

On the other hand, the identification-contrast model predicts, and evidence has shown, that

upward comparisons can produce assimilation (Buunk & Ybema, 2003). Therefore, those

who lack existing identification with the group might have a greater need to seek self-

enhancing assimilation with an upward target when they are under threat (e.g., in a negative

mood). This consideration leads to a rival hypothesis competing with H4a.

> H4b: Individuals in a negative mood spend more time browsing profiles with upward
>
> social comparisons, and less time browsing profiles with downward social
>
> comparisons, compared to individuals in a positive mood, *in particular when group*
>
> *identification is low*.

SNS Effects on Well-Being

Next, understanding outcomes of mood-driven selective social comparisons can help to shed light on conflicting evidence regarding the effects of SNS use on well-being. While experimental work suggested positive outcomes of self-enhancing social comparisons (Haferkamp & Krämer, 2011), correlational studies have found negative relationships between SNS use and well-being. However, this pattern could be indicative of a reverse causality: SNS use could have served the purpose of regulating undesired moods and self-doubts (Knobloch-Westerwick, 2015). The few survey studies that made use of multiple time points are limited by survey measures that confounded social comparison and its effects, or neglected the varied nature of SNS use altogether.

For example, a 2-week experience sampling study found that Facebook use had negative effects on subsequent affective and cognitive well-being (i.e., mood and life satisfaction), but that that diminished well-being was not predictive of later Facebook use (Kross et al., 2014). However, social comparison was not directly assessed, and Facebook use was measured by sheer quantity. A panel survey (Feinstein et al., 2013) asked participants to report negative versus positive feelings resulting from Facebook social comparisons. Hence, the measurement of social comparison was confounded with that of emotional response.

Likewise, a 14-day diary study tracked Facebook usage, upward and downward comparisons, and depressive symptomology (Steers et al., 2014). More frequent and longer usage predicted more upward and less downward comparison. Intriguingly, both types of comparison produced increased daily depressive symptoms. However, much like Feinstein et al. (2013), items used by Steers et al. (2014) equated upward comparison with negative affect/self-evaluation. By measuring outcomes of particular comparisons in this way, finding depression effects via upward comparison is to be expected, yet surprising via downward comparison. This confounding of comparison direction and outcomes limited what can be

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inferred from those diary data. Critically, however, they also show evidence of reverse

causality, as depressive symptomology increased the likelihood of later social comparisons

(Steers et al., 2014). While comparisons made on Facebook could have harmed well-being,

they were also driven by prior states of diminished well-being.

Other survey data found that first-year college students had negative relationships

between SNS use and well-being, but senior students had positive relationships (Kalpidou,

Costin, & Morris, 2011), indicative of a self-regulatory function (Knobloch-Westerwick,

2015) that aided well-being over time. These studies and their limitations highlight the

importance of testing three distinct stages of SNS social comparison processes: motivations,

actual social comparisons, and effects.

Differential effects of social comparison. It is quite clear that both upward and

downward comparisons can each yield negative and positive effects under certain conditions

(Buunk, Collins, Taylor, Van Yperen, & Dakof, 1990). Similar differences may exist

between the outcomes of mood and self-esteem. Contact with upward comparisons can be

sought for the positive mood they provide, although those comparisons might be avoided

since they are likely to harm self-esteem (Taylor & Lobel, 1989). Similarly, comparisons

with downward targets might boost self-esteem yet harm mood via contact (Taylor & Lobel,

1989). On the other hand, Blanton et al. (2000) found identification-contrast effects for state

self-esteem, yet not for positive or negative mood. Differential effects may arise when

comparisons are sought for a given purpose such as mood regulation or self-affirmation

(Blanton et al., 2000), but have potential to yield latent effects.

Relative to the present topic, Sagioglou and Greitemeyer (2014) found 20 min of

Facebook browsing produced more negative moods than browsing the internet or no

exposure, and they concluded that poor affective forecasting explains why Facebook use

remains popular despite producing negative feelings. According to mood management theory

(Zillmann et al., 1980), people learn over time what media content can address affective needs. However, it is also likely that SNS content will be sought for particular beneficial effects but also yield inadvertent detrimental effects. Kang, Chung, Mora, and Chung (2013) also found nuanced outcomes through self-reported social comparisons on Facebook by high school students. Although this study's measures also confounded comparisons and emotional effects (cf. Feinstein et al. 2013; Steers et al., 2014), it distinguished between downward and upward comparisons involving either assimilation or contrast. Upward-identification was associated negatively with depression and positively with life satisfaction. Accordingly, upward-contrast and downward-identification were positively associated with depression and negatively with life satisfaction.

More recently, Batenburg and Das (2015) found that tendencies toward upward-contrast and downward-identification in computer-mediated social comparisons were linked to worry and depression among users of an online support group for breast cancer patients. The implication is clear: that assimilation versus contrast (Buunk & Ybema, 1997) is key to social comparison effects.

Given the results of Study 1, which suggested upward social comparisons to cue-abundant SNS profiles involved identification-driven emotional contagion, we propose that:

H5: More time spent viewing upward social comparison targets in a cue-abundant context induces greater positive mood.

H6: More time spent viewing upward social comparison targets in a cue-abundant context induces lower negative mood.

H7: More time spent viewing upward social comparison targets in a cue-abundant context induces lower state self-esteem.

Finally, group identification has proven vital to positive outcomes of self-enhancing social comparisons (Blanton et al., 2000; Buunk & Ybema, 2003; Knobloch-Westerwick & Hastall,

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2010). Thus, we present an additional hypothesis.

H8: Greater preexisting group identification should moderate the effects in H5-H7,

producing more positive mood, less negative mood, and lower self-esteem.

Method

Participants. Students (N = 152) were recruited in the same manner as Study 1. This

sample was M_{age} = 20.62, SD = 3.45; 54.6% women; 69.5% White, 10.6% Asian, 9.3%

Black, 4.6% Hispanic/Latino, 1.3% Pacific Islander, 2.6% multiracial, 2.0% other.

Procedure. The experiment used the same basic procedure as Study 1. However, it

added the group identification measure to the pre-exposure questionnaire that also measured

media use and demographics, and it added measures of mood and state self-esteem in a post-

exposure questionnaire.

Measures.

Group identification. A four-item measure of in-group identification (sample item:

"How strong a sense of belonging do you have with [Name of University] students?" 1 = *not*

at all = to 5 = *extremely*) was adapted from Mastro, Behm-Morawitz, and Kopacz (2008) and

used to measure identification with the university community (α = .866, M = 3.99, SD =

0.73). To aid analysis, a mean split was performed, such that participants scoring < 4

(37.75%) were coded as low, while those scoring $\geq$ 4 were coded as high, on identification.

Media use. Daily use measures for internet and SNS (0 = *None at all*, 1 = *Less than*

30 minutes, 2 = *30 to 60 minutes*, 3 = *1 to 2 hours*, 4 = *2 to 3 hours*, 5 = *3 to 4 hours*, 6 =

More than 4 hours) were employed as covariates, along with sex and age. Participants were

frequent daily users of the internet, M = 4.58, SD = 1.24, and SNSs, M = 3.43, SD = 1.66.

Selective exposure. As with Study 1, unobtrusive measurement of browsing assessed

selective exposure in seconds spent on the various pages. Participants viewed M = 5.47 (SD =

1.83) of the eight profiles, allowing selectivity during the limited browsing time. The average

profile was viewed for $M = 15.99$ s, $SD = 4.03$. Mood did not affect overview time, $p = .27$.

Post-exposure mood and self-esteem. The 10 positive mood items of the PANAS

(Watson, Clark, & Tellegen, 1988), ranging 1-5, were summed ($\alpha = .889$, $M = 23.63$, $SD =$

8.18). Likewise, the 10 negative items, ranging 1-5, were summed ($\alpha = .855$, $M = 14.60$, SD

$= 5.54$). Heatherton and Polivy's (1991) state self-esteem scale examined self-evaluation after

browsing. It includes 20 items, ranging 1-5 and summed ($\alpha = .883$, $M = 70.36$, $SD = 11.80$).

Results

Effects on selective social comparisons. A mixed-model ANCOVA with 2x2 within-

subjects (comparison direction x comparison dimension) and 2x2 between-subjects (mood x

group identification) factors, plus age, sex, daily Internet use, and daily SNS use as

covariates, was conducted to test for effects on selective social comparisons. It showed that

the predicted three-way interaction was evident between comparison direction, mood, and

group identification, $F(1, 143) = 4.17$, $p = .04$, $\eta_p^2 = .03$. Among those low on group

identification, there was less downward comparison and more upward comparison in the

negative mood than in the positive mood condition; in fact, positive mood produced no

significant difference between upward and downward comparisons.

In contrast, those high on group identification demonstrated high levels of upward and

low levels of downward comparison, regardless of mood. This pattern supports H4b and is

further interpreted in the discussion. The three-way interaction and the relevant estimated

marginal means are presented in Figure 3. As in Study 1, no moderating effects of

comparison dimension (ps $> .313$) or sex (ps $> .583$) emerged.

Effects of upward social comparisons on mood and self-esteem. To test the effects

of selective social comparisons to upward targets, multiple regression analyses with

hierarchical entry were conducted. Three parallel models examined positive mood, negative

mood, and state self-esteem as dependent variables. Each regression model consisted of three

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blocks of variables: (a) demographic variables of sex, age, internet use, and SNS use, (b)

mood condition, and (c) time spent viewing upward targets on the career dimension, and time

spent viewing upward targets on the attractiveness dimension. These two dimensions of

selective social comparison were only moderately correlated, $r(152) = .462$, $p < .001$, so that

multicollinearity was not a threat to analyses. Standardized coefficients are reported below.

After controlling for demographics and initial mood, positive mood was positively

affected by selective social comparisons to upward career targets, $b* = .205$, $p = .03$, but was

unaffected by selective social comparisons to upward attractiveness targets, $b* = .005$, $p =$

.95. Negative mood was not significantly impacted by selective social comparisons to upward

career targets, $b* = -.116$, $p = .22$, or upward attractiveness targets, $b* = .053$, $p = .58$.

In contrast to the effects on positive mood, state self-esteem was unaffected by

selective social comparisons to upward career targets, $b* = -.058$, $p = .53$, but was

marginally negatively affected by selective social comparisons to upward attractiveness

targets, $b* = -.173$, $p = .06$.

Finally, group identification was entered as a potential moderator of the effects on

mood and state self-esteem. Group identification moderated the effect of selective social

comparisons to upward career targets on positive mood, $b* = .721$, $p = .009$, such that those

with high group identification and more selective exposure to these targets reported even

greater positive mood after exposure. For state self-esteem, group identification did not

moderate the effect of upward attractiveness comparisons, $b* = .668$, $p = .51$.

Discussion

Study 2 extended the findings of the previous experiment, by including group

identification with comparison targets as a between-subjects quasi-experimental factor, and

by testing outcomes of selective social comparisons. Group identification moderated the

mood effect on SNS social comparisons. However, the results require further interpretation.

Among participants with relatively low group identification with the SNS social group, results are similar to those seen in Study 1. When induced into a negative mood, much more time was spent browsing upward rather than downward comparison targets, among the cue-abundant photographic SNS profiles. In contrast, low identifiers in a positive mood showed no significant difference in their time spent on upward and downward social comparisons. The finding supports H4b, which proposed that low identifiers would seek upward assimilation; such a mechanism is consistent with the identification-contrast model's proposal that comparison can produce assimilating identification (Buunk & Ybema, 2003).

The results for participants with low group identification are surprising if their comparison targets were considered to be out-group members, as much previous research indicated that downward comparisons with out-group members are typically sought for self-enhancement (e.g., Blanton et al., 2000; Knobloch-Westerwick & Hastall, 2010). However, even those relatively low on group identification still scored above the midpoint of the scale, on average ($M = 3.25$, $SD = 0.54$). Thus, these individuals may still have seen the comparison targets as in-group members, albeit ones they did not initially identify very highly with.

In contrast, participants with high group identification exhibited consistently high levels of selective exposure to upward social comparisons. This pattern did not interact with mood. High group identifiers appeared to value assimilation via upward comparisons, regardless of mood. While high group identification did not appear to elicit greater self-enhancing patterns (H4a), this may have been due to high group identifiers' strong general preference for upward assimilation.

Next, the effects of selective social comparisons were assessed for post-exposure mood and self-esteem. The results provided partial support for H5 (positive mood), but no effects were seen for H6 (negative mood). This finding is consistent with the premise that upward comparison targets are a source of positive emotional contagion and may be sought

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out for their hedonic effects (Buunk, & Ybema, 1997; Kramer et al., 2014). For H7 (state

self-esteem), results fell short of statistical significance. More time spent on upward

comparisons produced significantly greater positive mood when the comparison was on the

career success dimension, and marginally lower state self-esteem when the comparison was

on the attractiveness dimension.

The effect on positive mood was also moderated by group identification. More

exposure to highly successful SNS profiles produced even more positive mood when the

participant identified highly with the social group. Buunk and Ybema's identification-

contrast model (1997) also posited that control over a dimension of comparison allows for

more assimilation and more positive mood following comparison. Accordingly, career

prospects might have been perceived as more subject to behavioral control than appearance,

accounting for the differential outcomes observed for comparisons on the two dimensions. In

summary, upward assimilation facilitated mood management via SNS social comparisons,

but possibly with a counterproductive effect on self-esteem.

General Discussion

The popularity of SNSs suggests they provide desirable experiences. One prominent

feature of an SNS is extensive social comparison opportunities. Surveys have shown

connections between frequency and duration of SNS use and low levels of well-being,

leading some to conclude that social comparison with others who have engaged in digitally-

enhanced self-presentation diminishes well-being (Chou & Edge, 2012; Feinstein et al., 2013;

Steers et al., 2014). However, reverse causality was not ruled out by these findings, and

studies that made use of longitudinal designs consistently conflated social comparisons with

emotional reactions to those comparisons.

Alternatively, the selective exposure perspective suggests that media users make

motivated choices about their media consumption to regulate their moods and self-concepts

over time (Knobloch-Westerwick, 2015). Hence, prior experimental research indicated that

downward social comparisons made on SNSs could enhance mood and self-perceptions

(Haferkamp & Krämer, 2011) and that they were sought out for this purpose when

individuals experienced negative moods (Johnson & Knobloch-Westerwick, 2014). The

present work extended those findings, by using the Johnson and Knobloch-Westerwick

(2014) procedure but also adding vivid and detailed cues typical of social media: photos,

employment information, and valenced status updates about career and physical appearance.

Drawing from the identification-contrast model of social comparisons (Buunk & Ybema,

1997), we observed not only how self-enhancing social comparisons occurred in the SNS

environment, but also how group identification moderated the process. Further, effects of

selective social comparisons on mood and self-esteem were evident.

As observed previously for selective social comparisons on SNS (Johnson &

Knobloch-Westerwick, 2014), we found here that upward comparisons were more prevalent

than downward comparisons, supporting H1. In contrast to the earlier work, negative mood

did not diminish the tendency toward upward comparisons but instead reduced the appeal of

downward comparisons. This difference is attributable to the sole difference in design and

procedure, the presence of multiple textual and photographic cues in contrast to mere ratings

of profiles in Johnson and Knobloch-Westerwick (2014). Thus, the vividness of the

comparison targets (Buunk & Ybema, 1997; Taylor & Lobel, 1989) allowed upward

comparisons to facilitate mood management through assimilation and emotional contagion,

as opposed to contrast against imagined others (Taylor & Lobel, 1989) or hyperpersonal

perceptions (Walther, 1996; Walther et al., 2001). Thus, H3 was supported rather than H2.

In Study 2, greater group identification with their university led students to

consistently seek upward social comparisons on the SNS featuring supposed alumni, while

those with less group identification only sought upward comparisons over downward

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comparisons when negative mood was present. This finding was in line with H4b in contrast

to H4a. Finally, upward career comparisons produced positive mood (partially supporting

H5), which was moderated by group identification (in line with H8), while upward

appearance comparisons deflated state self-esteem (albeit marginally; H7).

Hence, SNS users do make selective, self-enhancing choices about which SNS

content they view. Further, it appears that social comparisons sought for mood management

purposes can improve positive mood, but perhaps at the expense of self-esteem. However,

these effects are nuanced and depend on the dimensions on which comparisons are made.

Recent surveys which have purported to identify a link between SNS, social comparison, and

harms to subjective well-being appear to be obscuring the detailed picture. Instead, a

motivated process of affect- and self-management is at work, the nature of which is

contingent on aspects of the social media environment such as the kinds of content and cues

available. Further, immediate social comparison effects appear to be a "mixed bag" (cf. Kang

et al., 2013), in which different components of subjective well-being must be considered.

Several strengths and limitations of the present studies should be considered, along

with future research suggestions. First of all, the studies benefited from using experimental

mood inductions, which allowed assessing the predictive role of mood in SNS social

comparisons through rigorous causal inferences. Rarely are motivations for social

comparison examined in the SNS context, much less specifically tested.

Additionally, measuring post-exposure differences in mood and self-esteem in Study

2 allowed demonstrating further processes and causal relationships. Both studies made use of

ecologically valid settings, in which participants were free to browse web pages featuring

SNS-like content. This feature was a strength in that it captures the actual behavior in

question (selective exposure to varied types of content) and avoided the many limitations of

retrospective self-reports. On the other hand, social comparison is a mental process, and

future research should complement behavioral measures with social comparison self-reports.

Direct manipulation of the SNS content in question helped to prevent confounds. However, the stimuli were limited in several ways. First of all, they were a mere approximation of a real SNS. Participants could not view real acquaintances' profiles, and the site featured a limited number of profiles. Future research should also consider consequences for social comparison of inconsistent cues (Van Der Heide et al., 2012) as well as relational and cue differences between the various SNSs (Choi & Bazarova, 2015). The present investigation combined both the number and vividness of cues (Nowak et al., 2005), yet these aspects of cue-lean versus cue-rich media may be disentangled, too. Additionally, the ability to test group identification effects (H4a and H4b) was limited by relatively high levels of identification in the sample. Future research could use clear in-group and out-group profiles.

Finally, future research should examine the impacts of impression formation media richness in further depth. The consequences of low- versus high-bandwidth cues for mood and self-esteem outcomes should be examined, especially in light of recent findings that less rich media may have more potential to produce recall and rumination (Mickes, et al., 2013) and effects on self-perception (Gonzales, 2014). It is clear that SNS users can engage in various self-enhancing strategies for making social comparisons online, and that these behaviors are key to understanding how SNS use relates to well-being.

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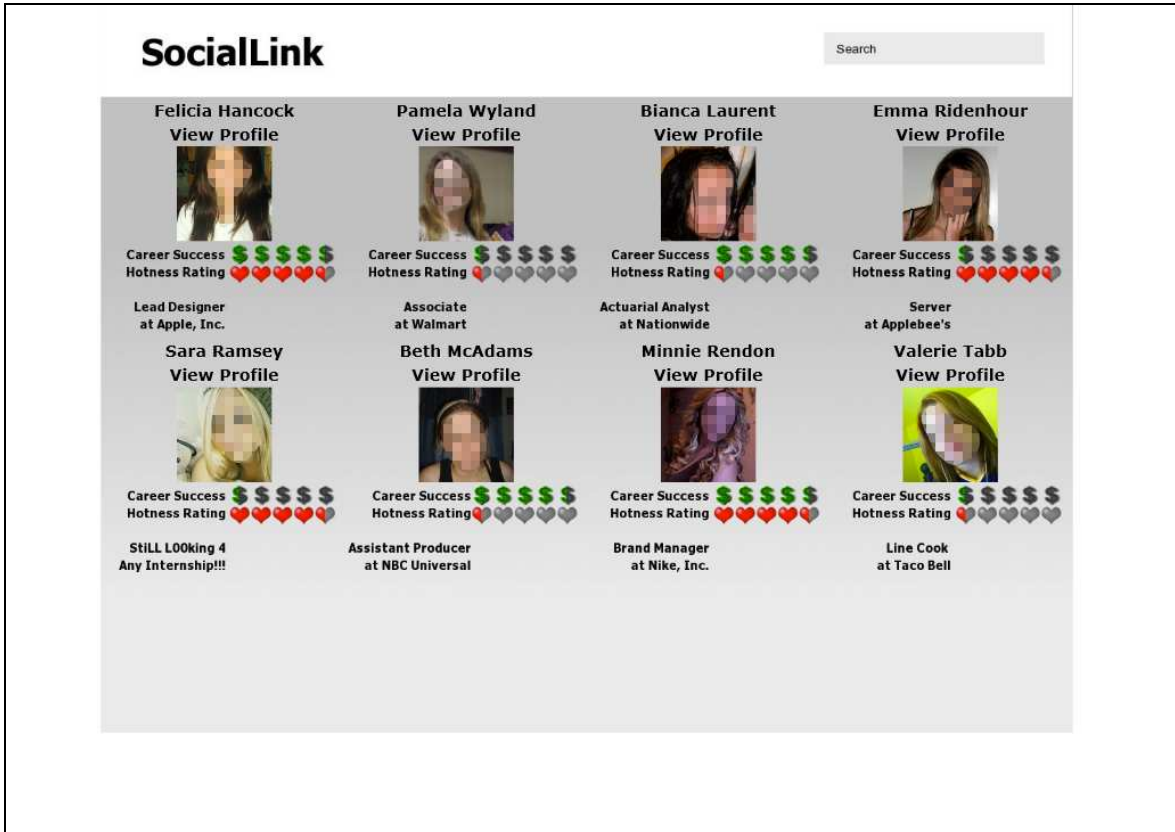SOCAL COMPARISON TO SNS PHOTOS   33

Figure 1. Sample stimulus overview page, featuring previews of female profiles. Faces are

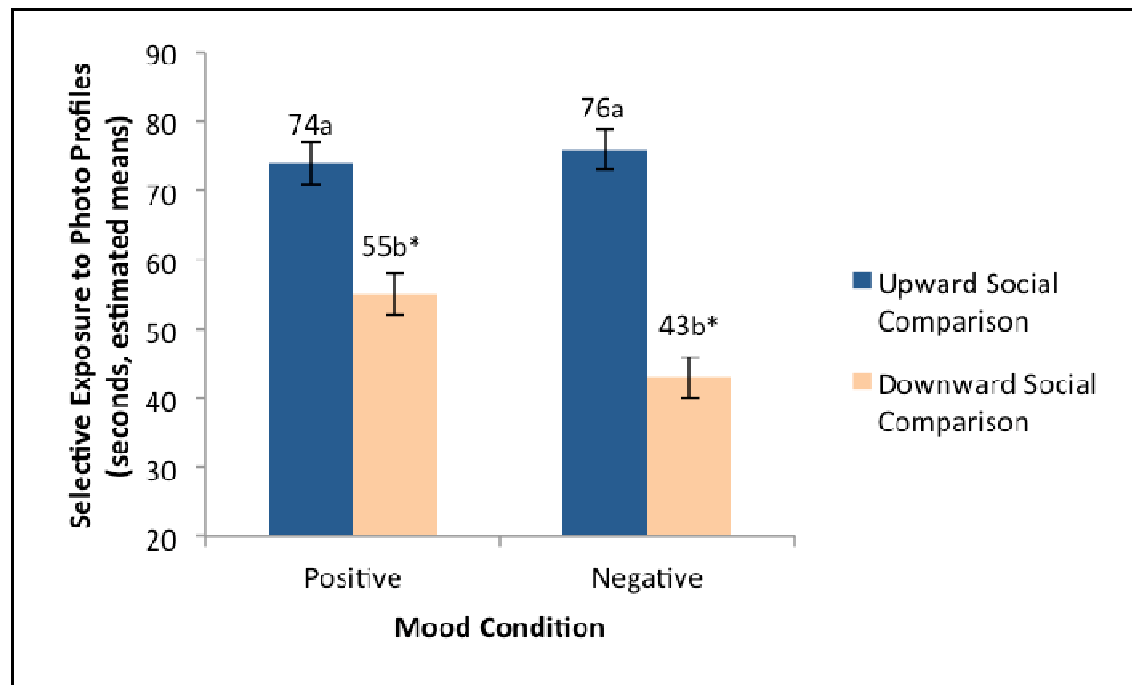obscured for presentation in the manuscript.

Figure 2. Selective exposure to upward and downward social comparisons as a function of mood. Differing lower-case letters indicate significant within-subjects differences in selective exposure, $p < .001$. Asterisks indicate significant between-subjects differences in selective exposure, $p < .001$. Sex and comparison dimension served as additional between- and within-subjects factors, respectively.
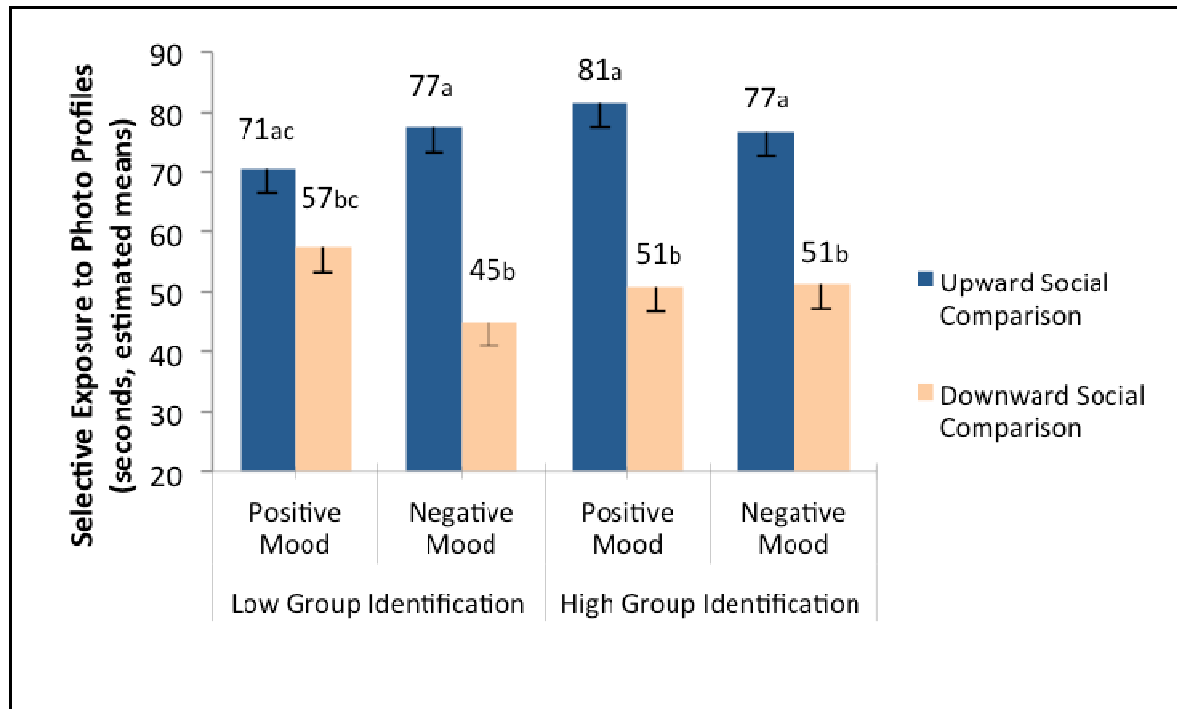
SOCAL COMPARISON TO SNS PHOTOS

Figure 3. Selective exposure to upward and downward social comparisons as a function of

mood. Differing lower-case letters indicate significant within-subjects differences in selective

exposure, *p* < .001. Comparison dimension served as additional within-subjects factor, while

age, sex, daily Internet use, and daily SNS use served as control covariates.