Social Threat and Cognitive Load Magnify Self-Enhancement and Attenuate Self-Deprecation

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Reports

Social threat and cognitive load magnify self-enhancement and attenuate self-deprecation

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HIGHLIGHTS

- We tested competing views about the processes underlying self-serving social comparisons.
- Self-esteem threat and cognitive load were manipulated while participants made social comparisons.
- Threat and load increase self-favoring judgments about personality and future events.
- Threat and load decrease self-deprecating judgments about future events.
- Self-enhancement influences social comparison when threat or cognitive demand is high.

ABSTRACT

Has self-enhancement been too heavily emphasized as a motivating factor in social comparisons? Recently, researchers have argued that some types of social-comparative judgments may differ in important ways from other self-evaluative phenomena typically offered as evidence of self-enhancement motivation. In contrast to a large body of research showing that self-esteem threat affects other self-evaluative processes, the literature remains silent on how self-esteem threat affects social comparisons between self and an average peer. Furthermore, whereas social comparisons appear to be self-favoring (i.e. 'better than average') in many domains, they are predictably self-deprecating (i.e., 'worse than average') in others. As a result, recent models of social-comparative judgment posit that cognitive efficiency, rather than self-enhancement, may more typically account for the manner in which people compare themselves to peers. The current research addresses this controversy by investigating how the tension between self-enhancement and need for cognitive efficiency is resolved in social comparison. Two experiments examined the crossed effects of self-esteem threat and cognitive load on social comparisons of personality traits (Experiment 1) and likelihood of future events (Experiment 2a–b). Both self-esteem threat and cognitive load increased the self-favoring nature of social comparisons including those otherwise characterized by self-deprecation. The findings show that self-enhancement does significantly influence social comparison with peers and, in fact, most parsimoniously accounts for these social-comparative judgments when cognitive resources are limited. Furthermore, self-deprecating social comparisons are attenuated in the face of self-esteem threat and, therefore, do not provide a substantial challenge to the role of self-enhancement in social comparison.

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Introduction

Have some of the prevailing assumptions about the motivations underlying social cognition missed their mark? A number of motivations are known to influence social cognition and are often used to explain the biases in social cognition (e.g., Kunda, 1990; Sedikides & Strube, 1995). But researchers have recently questioned whether explanations of social-comparative judgments have focused too heavily on self-

enhancement motivation as an underlying factor (e.g., Chambers & Windschitl, 2004; Moore & Small, 2007). Along with a host of other self-evaluative processes, social-comparison judgments are prototypically offered as evidence of self-enhancement motivation because of their tendency to portray the self as more positive than warranted (e.g., Robins & Beer, 2001; Sedikides & Gregg, 2008; Taylor & Brown, 1988). When comparing themselves to an average peer, the majority of people report that they have significantly more desirable personalities and are significantly more likely to experience positive future events (for reviews see Chambers & Windschitl, 2004; Taylor & Brown, 1988). Although individuals are likely to have some traits or positive future experiences that make them stand out from peers, peers would also be

expected to have some traits and positive future events that make them stand out. Therefore, evaluating the self as significantly better than an average peer across numerous traits or expressing significantly more optimism about one's own future is considered to be evidence of an underlying self-enhancement motivation (e.g., Taylor & Brown, 1988). That is, the motivation to protect self-esteem is partially accomplished by enhancing one's standing in relation to an average peer.

However, researchers have begun to question whether self-enhancement should be considered a central motivation in this type of social-comparative judgment (e.g., Chambers & Windschitl, 2004; Moore & Small, 2007). One potential challenge is the lack of evidence that social comparative judgments are used to defend against self-esteem threats. Whereas the literature repeatedly shows that self-esteem threat increases the magnitude of the other self-evaluative processes often cited as evidence of self-enhancement motivation (i.e., taking credit for success but not for failure: for reviews see Campbell & Sedikides, 1999; vanDellen, Campbell, Hoyle, & Bradfield, 2011), researchers point out that there are no straightforward tests of how self-esteem threat affects social-comparative judgment (Chambers & Windschitl, 2004). Two studies find that performing a challenging puzzle task increases the self-favoring nature of subsequent social comparisons (Brown, 2012; Vohs & Heatherton, 2004). However, previous research has used the difficult puzzle task to measure (e.g., vanDellen & Hoyle, 2010) or manipulate self-control (e.g., Baumeister, 2002) making it unclear whether the difficult puzzle manipulation serves to deplete cognitive resources for subsequent tasks, threaten self-esteem, or both.

The role of self-enhancement motivation in social comparisons is also challenged by evidence that social comparisons are not always self-favoring. In certain domains, people tend to deprecate themselves in comparison to others (i.e., 'worse-than-average' effects and comparative pessimism: Blanton, Axsom, McClive, & Price, 2001; Chambers & Windschitl, 2004; Kruger & Burrus, 2004; Moore & Small, 2007) or may not enhance themselves (e.g., they do not inflate their perceptions of their status: Anderson, Srivastava, Beer, Spataro, & Chatman, 2006). Taken together, the literature remains silent on whether social comparisons are used to defend against self-esteem threat and raises the possibility that social comparisons even deprecate the self in certain domains. Are social comparisons affected by self-esteem threat, and if so, how robustly are they used? In the face of self-esteem threat, do social comparisons typically characterized by self-deprecation tend to persist, worsen, or become more flattering?

Even if self-esteem threat was to influence social comparisons, it is important to understand the relative influence of self-enhancement motivation on social comparisons when cognitive resources are tapped. Researchers do not dismiss the role of self-enhancement completely, but have suggested that cognitive efficiency more typically drives social comparisons (e.g., Chambers & Windschitl, 2004; Moore & Small, 2007). These alternative accounts point out that, in many other domains, human judgment strongly relies on cognitive shortcuts that alleviate the need for extensive cognitive expenditure (Tversky & Kahneman, 1974). For example, self-deprecating social comparisons are known to arise from a number of these cognitive shortcuts that people rely on when making judgments (e.g., differential information available for self compared to others, focusing on self rather than others: Chambers & Windschitl, 2004; Kruger & Burrus, 2004; Moore & Small, 2007). In fact, these same cognitive shortcuts also produce the positively-skewed social comparisons in other domains (Chambers & Windschitl, 2004; Moore & Small, 2007). In other words, researchers have not focused on particular heuristics or degrees of cognitive effort as a means of delineating the operation of a self-enhancement motivation. Instead, they question whether cognitive efficiency, rather than self-enhancement, is a more typical or stronger motivational influence on social comparison.

The current literature cannot conclusively speak to the relative role of self-enhancement and cognitive efficiency in social comparisons for several reasons. For example, cognitive load sometimes magnifies the favorability of the self in social comparison and sometimes has no effect

(Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Beer & Hughes, 2010; Koole, Dijksterhuis, & van Knippenberg, 2001; Kruger, 1999; Lench & Ditto, 2008). Yet the effect of cognitive demand on social comparisons has been mostly tested in relation to positively-skewed social comparisons whose underlying motivation is ambiguous. Furthermore, no current studies address the crossed effects of self-esteem threat and cognitive demand which are needed to more fully understand whether the influence of self-enhancement prevails in social comparisons when the need for cognitive efficiency is high. Nor has much attention been paid to self-deprecating social comparisons which are likely to be particularly illuminating. If self-enhancement plays a relatively important role in social comparisons, then self-esteem threat, cognitive load, and their combination should attenuate self-deprecating social comparisons. Alternatively, if cognitive efficiency plays a relatively more central role (e.g., Chambers & Windschitl, 2004), then cognitive load and cognitive load combined with self-esteem threat should magnify self-deprecating social comparisons by encouraging greater reliance on their underlying cognitive shortcuts. A final possibility is that self-enhancement concerns can only dominate when ample cognitive resources are available (Schmeichel & Demaree, 2010 but see Baumeister, DeWall, Ciarocco, & Twenge, 2005). In this case, self-deprecating social comparisons may only be attenuated in the face of self-esteem threat but not when it is combined with cognitive load.

The present research investigates the role of self-enhancement in social comparisons by examining the effects of self-esteem threat and cognitive load. Experiment 1 developed a method for manipulating social-evaluative threat and tested the effects of threat on social comparisons of personality traits. Experiments 2a–b then tested the combined effects of cognitive load and an improved social-evaluative threat manipulation on social comparisons. Experiment 2b included a domain characterized by self-deprecating, that is, 'worse-than-average' social comparisons. If self-enhancement (rather than cognitive efficiency) plays a relatively central role in social comparison, then social comparisons should become more self-flattering in the face of imminent self-esteem threat but also when people are stripped of cognitive resources (i.e., conditions of cognitive load). Moreover, these effects should be found in domains otherwise characterized by self-deprecating social comparison.

Experiment 1

Experiment 1 tested the effect of self-esteem threat on social-comparative judgments of personality traits in a within-subject design.

Materials and methods

Participants

62 native English-speaking participants (47 female; mean age = 19.0, SD = 1.3 years; 3.2% African American, 38.7% Asian, 16.1% Latino/Hispanic, 38.7% Caucasian, and 3.3% "other") completed the two-session experiment for course credit. Data from an additional eleven participants were not analyzed because participants expressed suspicion about the threat manipulation (described below).

Procedure

A within-subject design was used to manipulate social-evaluative threat while participants made social-comparative judgments. Threat was manipulated through ostensible rater-perceptions of each participant's likability (e.g., Horton & Sedikides, 2009; Leary, Haupt, Strausser, & Chokel, 1998; Somerville, Heatherton, & Kelley, 2006; Somerville, Kelley, & Heatherton, 2010; Swann, Hixon, Stein-Seroussi, & Gilbert, 1990). An initial lab session sets the stage for the threat manipulation used in relation to the social-comparative judgments. Participants had their head and shoulders photographed and were asked for permission to use the photographs in a cross-university rating study of likability.

Upon consent, participants were led to believe that they would learn the results of the likability ratings of their photograph from the other universities when they returned to the lab for the second session (i.e., the target experimental session).

In the target experimental session, participants were presented with rater-perceptions of their likability interspersed with social-comparative judgment probes. The rater-perceptions were visually depicted with a screen that consisted of (a) pictures of ostensibly randomly-selected sets of 10 raters (5 male, 5 female) that had ostensibly evaluated the participant's likability from the photograph taken in the initial session and (b) pie charts indicating how many of each set of 10 raters found the participant unlikable (threat condition: 6, 7, or 8 of the 10 raters; no threat condition: 0 of the 10 raters). In reality, there were no raters. Pictures of the ostensible raters were selected from a set of 240 photographs of college-aged individuals (120 males, 120 females) used in previous research (Somerville et al., 2006, 2010). Beneath the pictures of the ostensible raters, green and red pie charts indicated the percentage of each randomly selected set of 10 raters who found the photograph likable. Red was used to indicate how many raters did not find the photograph likable and green indicated how many raters did find the participant likable (e.g., a circle with 60% red, 40% green would indicate that 6 out of the 10 pictured raters did not find the participant likable).

Rater-perceptions of likability were interspersed with sets of social-comparison judgment probes. This procedure ensured that participants sometimes made social-comparison judgments immediately after their self-esteem had been threatened (e.g., social consensus that the participant's physical appearance was not likable) and sometimes made social-comparison judgments when no such threat existed (e.g., social consensus that the participant's physical appearance was likable). The rater-perceptions of likability manipulated the presence of social-evaluative threat about one's physical appearance but did not provide information for learning how to calculate the social-comparative judgments. In other words, it was not the case that participants could somehow use rater perceptions to derive population averages on personality traits to answer the social-comparative judgment probes (described below).

After seeing a screen with rater-perceptions of likability, participants rated how 8 of their own personality traits compared to their average peer using a 5-point scale (-2 = much less than the average UT student; 0 = about the same as the average UT student; $+2$ = much more than the average UT student). Across the experiment, each participant viewed 6 rater-perceptions of likability (randomly presented without replacement: 3 threat, 3 no threat) and judged 48 personality traits (randomly presented and counterbalanced across threat condition: 24 for threat, 24 for no threat). Trait words were undesirable traits used in previous research on social comparison judgment (e.g., Beer & Hughes, 2010; Dunning, Meyerowitz, & Holzberg, 1989; Hughes & Beer, 2012) and standardized on a number of dimensions including valence (i.e., social desirability), range of associated behaviors (i.e., trait breadth), frequency of use, and number of syllables (Anderson, 1968; Kirby & Gardner, 1972). As in previous research (Beer & Hughes, 2010; Chambers & Windschitl, 2004; Hughes & Beer, 2012), a standardized referent of "average peer" was defined for participants. Participants were instructed to evaluate their own personality traits in relation to an average student on their university campus who shared their age and gender. For these undesirable personality traits, lower scores are theorized to reflect social comparisons that are more self-enhancing (i.e., lower scores indicated that the self had less of the undesirable traits compared to peers) (Chambers & Windschitl, 2004). After completing the social-comparative judgment task, participants were fully debriefed and excused from the experimental session.

Results

Social-evaluative threat does increase the self-favoring nature of social comparison. After viewing threatening ratings about their physical appearance, participants rated themselves as having significantly fewer undesirable traits in comparison to their average peer (threat: $M = -0.64$, $SD = 0.44$; no-threat: $M = -0.51$, $SD = 0.46$; $t(61) = 3.16$, $p = .002$; Cohen's $d = .29$: Cohen's d for a dependent sample design was calculated as described in Dunlop, Cortina, Vaslow, & Burke, 1996).

Experiment 2a–b

Experiment 2a

Experiment 2a was built on Experiment 1 by testing the crossed effects of threat and load on social-comparative judgments. The experiment drew on an improved version of the social-evaluative threat manipulation used in Experiment 1 and a widely-used measure of cognitive load (i.e., memory for complex numbers). Social-comparative judgments were made for the same personality traits included in Experiment 1.

Material and methods

Participants

136 native English-speaking participants (78 female; mean age = 18.9, SD = 1.24 years; 4.4% African American, 13.2% Asian, 14.7% Latino/Hispanic, 63.2% Caucasian, and 4.4% "other") completed the two-session experiment for course credit. Data from three additional participants were not analyzed because they expressed suspicion regarding the revised version of the threat manipulation (one participant each in the no threat–no load, threat–no load, threat–load conditions).

Procedures

Participants completed the procedures from Experiment 1 with some exceptions. The threat manipulation from Experiment 1 was modified to increase believability (described below), a load manipulation was added to the procedure, and threat and load were both manipulated between-subjects.

All participants took part in an initial lab session identical to Experiment 1 except that in order to increase participants' belief in the threat manipulation, they were led to believe that they would have a chance to rate photographs of other students in their second experimental session. In the target experimental session, participants were randomly assigned to one of four conditions (threat–no load, threat–load, no threat–no load, no threat–load).

As in Experiment 1, rater-perceptions of participant likability were paired with sets of social-comparative probes. The content of the rater-perceptions of likability depended on whether participants had been assigned to a threat or no threat condition. Load was manipulated by asking participants to maintain various 5-digit numbers (load) or 1-digit numbers (no load) throughout the presentation of rater-perceptions and social-comparative judgment probes (e.g., Gilbert & Hixon, 1991; Naveh-Benjamin & Jonides, 1984; Pontari & Schlenker, 2000). Participants were asked to maintain a total of four numbers across the course of the experiment. All participants received a number to maintain before viewing any rater-perceptions of likability or completing any social comparison judgments. After every other set of social comparative probes, participants were instructed to forget their current number and given a new number to maintain. Experiment 2a included the same social-comparative probes for undesirable personality traits as used in Experiment 1. After completing the social-comparative judgment task, participants were fully debriefed and excused from the experimental session.

Results

Experiment 2a was built on Experiment 1 by showing that both threat and load increased the extent to which people compare themselves favorably to their peers. A 2 (threat, no threat) × 2 (load, no

load) between-subjects ANOVA predicting social comparisons of personality traits showed significant main effects of threat ($F(1,132) = 4.72$, $p = .03$, $\eta_p^2 = .04$) and load ($F(1,132) = 3.93$, $p = .05$, $\eta_p^2 = .03$) and a non-significant interaction term ($F(1,132) = .05, p = .82, \eta_p^2 = 0.00$) (see Table 1).

Experiment 2b

Experiment 2b was built on Experiment 1 and Experiment 2a by testing the crossed effects of threat and load on social comparisons for future events. In addition to providing a conceptual replication of Experiment 1 and Experiment 2a, the measurement of future events permitted a test of threat and load on social-comparative judgments in domains characterized by self-deprecation. When considering positive future events, people tend to believe that they are more likely than peers to experience common events but less likely to experience rare events (Blanton et al., 2001). Investigating self-deprecating social comparisons is critical to understanding how self-enhancement fares in relation to other motivational influences on social comparisons. The phenomenon of self-deprecating social comparisons has been offered as challenge to self-enhancement accounts. Like their self-favoring counterparts, self-deprecating social comparisons are associated with a host of different cognitive shortcuts (Chambers & Windschitl, 2004; Moore & Small, 2007). Therefore, researchers have questioned whether cognitive efficiency is perhaps a more typical motivation underlying social comparison. Although self-deprecating social comparisons have been offered as a challenge to self-enhancement accounts, nothing is known about whether they persist in the face of self-esteem threat. Furthermore, very little is understood about how cognitive demand affects self-deprecating social comparisons.

Material and methods

Participants
Participants were the same as Experiment 2a.

Procedures
Participants completed the threat and load procedures as in Experiment 2a but the social-comparative judgment probes were not about personality traits. Instead, participants judged how likely they were to experience a number of positive future events in comparison to their average peer. These included both common future events (elicits optimism about self in comparison to others: seven items reported in Kruger & Burrus, 2004 as well as "Graduate with greater than a 3.0 GPA" and "No night in the hospital for the next 5 years") and rare future events (elicits deprecation of self in comparison to others: seven items reported in Kruger & Burrus, 2004 as well as "Graduate with 4.0 GPA" and "No night in the hospital over next 50 years"). Higher scores are theorized to reflect social comparisons that are more self-favoring (i.e., higher scores indicate that there is a greater chance that the positive future events will happen to the self compared to peers: Kruger & Burrus, 2004). These items were

Table 1
Means and standard deviations for Experiment 2a–b.

	Threat		No threat	
	No load	Load	No load	Load
Measure	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Undesirable traits	−.58 (.36)	−.70 (.41)	−.42 (.35)	−.57 (.41)
Common, positive events	.84 (.57)	1.13 (.59)	.69 (.70)	.87 (.44)
Rare, positive events	−.56 (.71)	−.24 (.70)	−.73 (.61)	−.58 (.63)

Note. SD = standard deviation; negative values indicate much less than peers; positive values indicate much more than peers.

randomly intermixed with the personality trait items from Experiment 2a. After completing the social-comparative judgment task, participants were fully debriefed and excused from the experimental session.

Results

Experiment 2b extended the findings of Experiment 1 and Experiment 2a; both the threat and the load conditions increased the extent to which people believed they were more likely to experience positive future events. Furthermore, these effects were seen even when social comparisons were more typically characterized by self-deprecation (e.g., rare, positive future events). A 2 (threat, no threat) × 2 (load, no load) between-subjects ANOVA predicting social comparisons of common future events showed significant main effects of threat ($F(1,132) = 4.14$, $p = .04$, $\eta_p^2 = .03$) and load ($F(1,132) = 5.49, p = .02, \eta_p^2 = .04$) and a non-significant interaction term ($F(1,132) = .26, p = .61, \eta_p^2 = 0.00$) (see Table 1). Consistent with previous research, participants generally deprecated their comparative likelihood of experiencing rare but positive future events (i.e., a 'worse-than-average' response: Blanton et al., 2001). However, when self-esteem was threatened or cognitive demand was high, participants became relatively more self-favoring when judging their likelihood of experiencing those rare events. A 2 (threat, no threat) × 2 (load, no load) between-subjects ANOVA predicting social comparisons of rare events showed significant main effects of threat ($F(1,132) = 4.82$, $p = .03$, $\eta_p^2 = .04$) and load ($F(1,132) = 4.28, p = .04, \eta_p^2 = .03$) and a non-significant interaction term ($F(1,132) = 2.39, p = .48, \eta_p^2 = .02$) (see Table 1). These findings also address the concern that perhaps participants under threat or load simply moved their responses in a particular direction along the rating scale. In order for social comparisons to be more self-favoring, participants had to use lower ends of the rating scale in Experiment 1 and 2a but higher ends of the rating scale in Experiment 2b.

Discussion

The present research empirically addresses the challenges raised against the importance of self-enhancement accounts of social-comparative judgments and, in fact, suggests that self-enhancement most parsimoniously explains these judgments when cognitive demand is high. When people must cope with self-esteem threat (Experiment 1–2) or scarce cognitive resources (Experiment 2), their comparisons with an average peer become more self-favoring. Social comparisons that are self-deprecating are attenuated in the face of self-esteem threat and, as such, lose their meaning as a substantial challenge to self-enhancement accounts of social comparisons. Taken together, the findings show that social comparisons do behave like a number of other self-evaluation processes in the face of self-esteem threat (Campbell & Sedikides, 1999; vanDellen et al., 2011) and limited cognitive resources (Swann et al., 1990) even in domains where social comparisons are otherwise self-deprecating. Rather than dismiss or discount the influence of self-enhancement motivation on social comparison, the current research suggests that the most beneficial next steps will be to more deeply understand its relation to cognitive efficiency and to other factors known to shape social comparisons.

The current research casts the tension between self-enhancement and cognitive efficiency accounts of social-comparative judgments in a new light (Chambers & Windschitl, 2004; Moore & Small, 2007; Sedikides & Gregg, 2008). In contrast to concerns that self-enhancement has been too heavily emphasized as a central motivation in social comparison (Chambers & Windschitl, 2004), the current research suggests that self-enhancement parsimoniously explains social comparisons in situations beyond just self-esteem threat. Cognitive demand was associated with the attenuation of self-deprecating social comparisons. Yet the

most prevalent explanation of self-deprecating social comparisons is that they arise from cognitive efficiency rather than self-enhancement (Chambers & Windschitl, 2004; Moore & Small, 2007). If cognitive shortcuts give rise to self-deprecating social comparisons, then why is self-deprecation attenuated when cognitive demand is high? One explanation is that self-enhancement motivation strongly operates on social-comparative judgments not just in the face of self-esteem threat but also when cognitive resources are limited.

Furthermore, the findings suggest that social comparisons are not influenced by mutually exclusive trade-offs between self-enhancement and efficient cognitive processing. Instead, self-enhancement may influence social comparisons by co-opting the cognitive efficiency associated with so much of human judgment. Models of human judgment emphasize a number of fundamental cognitive shortcuts (e.g., heuristics and biases: Tversky & Kahneman, 1974). Many of these cognitive shortcuts explain both self-favoring and self-deprecating social comparisons in the absence of self-enhancement motivation (e.g., differential information available for self compared to others, focusing on self rather than others, accessibility, positivity: Kruger & Burrus, 2004; Moore & Small, 2007 and see Chambers & Windschitl, 2004 for a 3-stage model). The current study found that forcing participants to heavily rely on cognitive shortcuts (i.e., increasing cognitive load) increased the self-favoring nature of social comparisons even in the face of self-esteem threat. One explanation of this finding is that self-enhancement motivation may be accomplished through the selective use of low-cost cognitive processing (Kunda, 1990). In other words, self-enhancement is not broadly accomplished through any cognitive shortcut but instead selectively engages a smaller set that casts the self in a positive light (e.g., What is good about me? What is bad about other people?).

The implication that self-enhancement may be associated with a selective set of cognitive shortcuts in social comparisons suggests a different approach for building on models of social comparison that have emphasized cognitive efficiency and downplayed the role of self-enhancement. These models have been developed by focusing on how cognitive shortcuts can explain social comparison effects in the absence of self-enhancement needs. Instead, future research should focus on understanding how self-enhancement is likely to be accomplished (or not) in relation to the categories of cognitive shortcuts and stages of judgments outlined in these models (e.g., 3-Stage Model of Social Comparison: Chambers & Windschitl, 2004). Furthermore, if self-enhancement is a central motivation in social comparison, then its effect should not be undermined in conditions that make it difficult to use associated cognitive shortcuts. Skewed social comparisons (either self-favoring or self-deprecating) become relatively more calibrated when judgment conditions address underlying cognitive shortcuts. For example, social comparisons become relatively less self-favoring when people learn more about their comparison group or are encouraged to focus less exclusively on themselves (Chambers & Windschitl, 2004; Moore & Small, 2007). The current research suggests that a new way to build on these findings is to understand how self-enhancement motivation fares when conditions have the potential to disrupt the cognitive shortcuts used to cast the self in a positive light. For example, do the kinds of information known to work against self-favoring social comparisons still have an effect in the face of self-esteem threat? And, if so, a related question is whether self-enhancement is more cognitively costly under these conditions.

The implication that self-enhancement co-opts low-cost cognitive processing in social comparisons also suggests a new hypothesis about how positive feedback may affect social comparisons. Although positive feedback tends to reduce the self-favoring qualities of other self-evaluative processes, positive feedback about the self may not change the self-favoring nature of social comparisons. Positive feedback is theorized to assuage the need to self-enhance and, therefore, self-evaluative processes associated with self-enhancement are abandoned (vanDellen et al., 2011). The current research implies that a similar type of abandonment might be unlikely in the case of social comparison. A large set of cognitive shortcuts are known to underlie

social comparisons (Chambers & Windschitl, 2004). The current research suggests that self-enhancement is thought to co-opt a subset but not in a mutually exclusive manner. When people are not striving to protect their self-esteem, they should draw from the complete set of the cognitive shortcuts described in models of social comparisons. Many of these shortcuts will still result in social comparisons that favor the self (because of an emphasis on incorrect or impartial information: Chambers & Windschitl, 2004; Moore & Small, 2007).

One potential caveat of the current study is that the no threat condition may have served as a positive, rather than neutral, condition because participants were told that most raters liked their photographs. Even if this was the case, it is notable that social comparisons from the no threat condition (rather than the high threat condition) were more similar to previous studies using the same social comparison probes in the absence of any threat manipulation (Experiments 1 and 2: Beer & Hughes, 2010). Future research is needed to test whether positive feedback influences social comparisons through a relatively broader set of cognitive shortcuts than self-enhancement motivation.

Finally, the present research raises two other considerations. First, the main effect of load is consistent with, but does not provide incontrovertible evidence, that cognitive shortcuts underlie social comparisons used to defend self-esteem when cognitive demand is high. In other domains, expertise reduces the cognitive demand of complex cognitive processes (e.g., Logan & Cowan, 1984). Our adult participants may have been so expert at self-esteem defense that scarce cognitive resources did not undermine 'cherry-picking' information to cast the self in a favorable light. Enhancing social comparisons and other kinds of enhancing self-judgments are typically associated with reduced activation in neural markers of cognitive complexity (e.g., Beer & Hughes, 2010; Beer, Lombardo, & Bhanji, 2010; Hughes & Beer, 2012). However, nothing is known about whether these same neural markers of self-favoring social comparisons are found in the face of self-esteem threat. Additionally, to our knowledge, only one previous study has examined cognitive load effects for 'worse-than-average' judgments; this study found a marginal trend for people to rate their skills even more unfavorably when under load (Kruger, 1999). Both this previous study and the current study asked participants to rehearse strings of number or letters while performing their comparative judgments, but they also differed in a number of ways. The current study had a larger sample, a larger number of trials, and measured social comparisons for the likelihood of future events rather than skills. Future research will be beneficial for unpacking the meaning of the current finding.

In conclusion, the current research found empirical evidence that counters the speculation that self-enhancement only weakly affects social comparison. In fact, self-enhancement is the most parsimonious explanation of social comparisons (with an average peer) in the face of self-esteem threat as well as conditions of limited cognitive resources. The findings suggest that rather than focus on the divergence between self-enhancement accounts of social comparisons and cognitive efficiency, future research will benefit most by identifying their relation. One implication of the current findings is that self-esteem threat may engage a more constrained set of the cognitive shortcuts known to underlie social comparisons with an average peer. Future research is needed to more broadly understand the operation of different motivations and mechanisms in diverse forms of social comparative judgments.

Acknowledgment

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