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## Self-esteem, epistemic needs, and responses to social feedback

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### ABSTRACT

People with lower self-esteem (LSEs) suffer from poor relational well-being. This may occur, in part, because LSEs' epistemic needs constrain their ability to benefit from positive social feedback. Consistent with this hypothesis, LSEs felt undeserving of positive social feedback, which undermined their relational well-being (Experiment 1). After receiving positive social feedback, LSEs displayed an equal preference for additional positive and negative feedback, and their willingness to pursue negative feedback predicted poor well-being (Experiment 2). However, LSEs did seize the opportunity to pursue additional positive feedback about a domain of personal strength, and when they did so, their well-being benefited (Experiment 3). These results help explain chronic self-esteem differences in relational well-being and suggest avenues for future well-being interventions.

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Self-esteem; self-verification; social feedback; relationships; well-being

One of the most well-validated findings from the self and close relationships literatures concerns the link between self-esteem and *relational well-being*. People with lower self-esteem (LSEs) not only experience worse relationship outcomes than their higher self-esteem counterparts (HSEs), including higher rates of interpersonal conflict and breakups, but LSEs also experience more loneliness and crippling doubts about their value as relationship partners (e.g., Cameron & Granger, 2018).

To date, most research explains the link between self-esteem and relational well-being by citing self-esteem differences in regulating the need to belong (e.g., Murray, Holmes, & Collins, 2006; Murray, Rose, Bellavia, Holmes, & Kusche, 2002). According to Stinson and colleagues (2010), the self-esteem system includes a dedicated *belongingness sub-system*. This system monitors the social environment for feedback concerning one's relational value, produces an affective signal (positive or negative mood) indicating whether the feedback is positive or negative, and finally, prompts behavioral responses aimed at maximizing feelings of belongingness (or avoiding additional decrements in belonging). For LSEs, each of these processes has the potential to undermine their relational well-being. Compared to

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HSEs, LSEs perceive more rejection in their daily lives (Cameron, Stinson, Gaetz, & Balchen, 2010; Stinson, Cameron, Hoplock, & Hole, 2015) and experience more negative emotional reactions to the rejection they perceive (e.g., Bellavia & Murray, 2003). LSEs also prioritize behavioral self-protection when their belongingness needs are threatened (e.g., Murray et al., 2006). When LSEs feel insecure about a relationship partner's regard, they withdraw from the relationship and derogate their partner. This self-protective behavior causes their partner to withdraw from or feel negatively about the relationship, which in turn undermines LSEs' relational well-being. Thus, threats to belonging may trigger a process of behavioral confirmation that helps to explain why LSEs suffer poor relational well-being.

However, the self-esteem system also includes a functionally independent *epistemic sub-system* that services the powerful need for self-certainty and consistency (Stinson, Cameron, & Huang, 2015; Stinson et al., 2010). We argue that this system's functioning may also compromise LSEs' relational well-being. Like the belongingness sub-system, the epistemic sub-system monitors the social environment for cues concerning one's relational value. However, rather than concerning itself with the absolute positivity-negativity of that feedback, the epistemic sub-system determines whether the feedback is consistent or inconsistent with chronic (global) self-esteem. If the feedback is consistent with one's global self-esteem, then the epistemic sub-system produces feelings of self-certainty, or *epistemic certainty*, indicating that knowledge about the self has been verified. If the relational-value feedback is inconsistent with global self-esteem, then the epistemic sub-system produces feelings of epistemic confusion and discomfort, indicating that knowledge about the self has been contradicted. Presumably, these feelings of epistemic certainty or confusion prompt a behavioral response aimed at maximizing epistemic certainty.

The functioning of the epistemic sub-system's monitoring and signaling components has already been documented. For example, HSEs feel greater self-certainty after interacting with a social partner who behaves in a warm and accepting manner, because that positive relational-value feedback is consistent with their high self-esteem (Stinson et al., 2010; Experiment 3). In contrast, LSEs feel greater self-certainty after interacting with a social partner who behaves in a cold and aloof manner, because that negative relational-value feedback is consistent with their low self-esteem. Similarly, people express greater epistemic confusion and perceive their romantic partner to be less perceptive when their partner provides them with self-esteem-inconsistent feedback (Stinson et al., 2010, Experiment 5). Yet more research is needed to document how self-esteem moderates behavioral responses to relational-value feedback, and that is one of the goals of the present research.

In general, when people receive feedback that contradicts their self-views, they often avoid it, resist it, or derogate it as a means of reasserting their self-certainty (vanDellen, Campbell, Hoyle, & Bradfield, 2011; Swann, Chang-Schneider, & Larsen McClarty, 2007). Such reactions may not be particularly problematic for HSEs, because the self-esteem inconsistent feedback that they are motivated to reject would be *negative* relational-value feedback. Thus, protecting their self-certainty by rejecting or discrediting negative relational-value feedback would also protect their relational well-being. However, this reaction may be more problematic for LSEs, because the self-esteem inconsistent feedback that they are motivated to reject would be *positive* relational-value feedback. Thus, protecting their self-certainty by rejecting or discrediting positive relational-value feedback could hurt their relational well-being.

Consistent with this account, LSEs avoid interacting with strangers who have given them positive relational-value feedback (e.g., Robinson & Smith-Lovin, 1992). Similarly, insecure

(i.e., lower self-esteem) people would rather move out than continue living with someone who sees them more positively than they see themselves (Swann & Pelham, 2002). Furthermore, when LSEs share a failure experience with a social partner and receive a vote of confidence in return, their relational well-being is diminished (Marigold, Cavallo, Holmes, & Wood, 2014). LSEs also respond negatively to compliments from their romantic partner (Kille, Eibach, Wood, & Holmes, 2017; Marigold, Holmes, & Ross, 2007), which can lead their partner to “walk on eggshells” around them (Lemay & Dudley, 2011), creating a negative cycle that hurts LSEs’ relational well-being over time.

Across a range of social contexts, then, LSEs’ reactions to self-esteem inconsistent feedback appear to prioritize their need for self-certainty at the expense of their relational well-being. Overall, LSEs’ characteristic pattern of behaviors may result in lost opportunities to receive additional positive relational-value feedback – feedback that could potentially benefit their relational well-being in the long run. Thus, by examining people’s acute reactions to positive and negative relational-value feedback, the present research will shed light on the psychological processes that may serve to maintain self-esteem over time.

### **The present research**

In three experiments, we examine self-esteem differences in cognitive, affective, and behavioral reactions to positive relational-value feedback (Experiments 1, 2, and 3) and negative relational-value feedback (Experiment 3) from a romantic partner (Experiment 1) or from a bogus personality test (Experiments 2 and 3). The feedback concerns general relational value (Experiment 1), relational value on easily-observable *social commodities* like social skills and popularity (Experiment 2), or relational value on difficult-to-observe *communal qualities* like kindness and warmth (Experiment 3). We predict that HSEs will react to feedback in ways that support both their need for self-certainty and their relational well-being, whereas LSEs will react to feedback in ways that support their need for self-certainty at the expense of their relational well-being.

### **Experiment 1**

In our first experiment, we examine people’s reactions to imagining that their romantic partner gave them positive relational-value feedback. Participants in the experimental condition imagine that their romantic partner paid them a compliment about their intelligence and work ethic, both of which are desired qualities in a romantic partner (e.g., Li, Bailey, Kenrick, & Linsenmeier, 2002), and then complete measures assessing their own feelings of belongingness and epistemic certainty. In the control condition, participants imagine a hypothetical scenario involving another couple in which one romantic partner compliments the other, and then complete the belongingness and epistemic certainty measures on behalf of the compliment recipient. Finally, all participants complete a measure of their own relational well-being.

We chose to use this particular control condition because it will allow us to determine whether the reactions we observe in the experimental condition are self-motivated, as we propose, or whether they reflect more generalized scripts about how one should or should not respond to compliments.

We predict that both LSEs and HSEs will experience a positive belongingness response to the positive, self-directed, relational-value feedback, but only LSEs will experience

epistemic confusion in response to the positive feedback. Moreover, we predict that the positive self-directed feedback will cause LSEs to feel less close to their partner, and it will be LSEs' epistemic response, and not their belongingness response, that will explain this diminished relational well-being.

## Method

We recruited as many participants as we could in two academic terms (with several years in between terms; see supplemental materials for details), resulting in an initial sample of 245 undergraduate psychology students, all of whom were currently involved in a romantic relationship.<sup>1</sup> One woman was excluded because she did not complete the study, and three women and one man were excluded because they reported that they did not respond to the survey honestly and accurately. Thus, the final sample comprised 241 participants (196 women, 45 men;  $M_{\text{age}} = 20.49$  years,  $SD_{\text{age}} = 3.52$  years; 14.5% Asian, 2.1% African, 59.8% Canadian, 2.9% East European, 5.8% East Indian, 2.5% Middle Eastern, 2.9% West European, 2.5% West Indian, and 7% Other/unspecified ethnicities). Mean relationship length was 26.89 months ( $SD = 28$  months; range 1–255 months). The majority of participants (76%) indicated that they were in an "exclusive dating" relationship. Participants received partial course credit in appreciation for their time.

Sensitivity analyses using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2017) indicate that with this sample size, 95% power, and  $\alpha = .05$ , we can detect a population  $f^2$  of .05 for the critical Self-Esteem x Condition interaction.

## Procedure

Materials for all experiments are available on the Open Science Framework: <https://osf.io/59r7c>.

Participants volunteered for an online study on "Relationship Perceptions." Participants first completed a preliminary survey including demographic questions (e.g., age, gender; participants indicated if they were "male" or "female"), a self-esteem measure, and filler items to disguise our focus on self-esteem. Next, participants in the *self-directed condition* were asked to "Imagine yourself in the given situation, and then answer the following questions according to how you think you would respond in that situation." The situation read as follows:

Imagine that you have just received a high mark on a midterm in one of your classes. You had studied a lot for this midterm, but found it very difficult and so you weren't sure you did that well. Your mark is much higher than you expected and so you are very pleased with it. When you tell your romantic partner about this test mark, he [she] says "That's awesome! I'm proud of you. You are really intelligent and hard-working!"

Participants in the *other-directed condition* were asked to "Imagine two people, Jamie and Taylor, involved in the given situation, and then answer the following questions according to how you think Jamie would respond in that situation." The scenario they read was the same as the one used in the self-directed condition except that the scenario was written in gender-neutral language and the person receiving the high mark and the positive relational-value feedback was Jamie for all participants. Next, participants completed measures of their belongingness and epistemic responses, as well as a measure of relational well-being.

Finally, participants were thanked, debriefed concerning the true purposes of the study, and awarded their compensation.

### Measures

**Self-esteem.** Participants completed the Rosenberg's (1965) Self-Esteem Scale, which was adapted to a 7-point response format (1 = *strongly disagree*, 7 = *strongly agree*;  $\alpha = .91$ ).

**Belongingness response.** Participants rated how happy, secure, valuable, and accepted the positive relational-value feedback would make them/the compliment recipient feel using a 7-point scale (1 = *not at all*, 7 = *extremely*). These four items were aggregated to create a *belongingness response* index ( $\alpha = .88$ ).

**Epistemic response.** Using the same 7-point scale, participants rated the compliment recipients' deservingness, as well as how meaningful, sincere, and significant the relational-value feedback would be, how likely it would be for the partner to say something similar in the future, and the generalizability of the praise. These six items were aggregated to create an *epistemic response* index ( $\alpha = .75$ ), whereby higher scores indicated greater epistemic certainty.

**Relational well-being.** Participants responded to 12 statements measuring their felt security within their own romantic relationship (e.g., "My partner loves and accepts me unconditionally"), four items measuring satisfaction with their romantic relationship (e.g., "I am extremely happy with my current romantic relationship"), and three items measuring their commitment to their romantic relationship (e.g., "I am very committed to my relationship;" 1 = *not at all true*, 7 = *completely true*; Marigold et al., 2007). These items were aggregated to create a *relational well-being* index ( $\alpha = .89$ ).

### Results and discussion

Participant gender did not moderate any of the results that we report.

We used the same hierarchical regression model to predict belongingness response ( $M = 6.10$ ,  $SD = .90$ ), epistemic response ( $M = 5.70$ ,  $SD = .80$ ), and relational well-being ( $M = 5.92$ ,  $SD = .95$ ): Step 1) mean-centered self-esteem ( $M = 5.07$ ,  $SD = 1.18$ ) and dummy-coded condition (self-directed = 0, other-directed = 1); and Step 2) the Self-Esteem X Condition interaction. Results of the regressions predicting each of the dependent measures are presented in Table 1.

Results of the regression predicting participants' belongingness response revealed a Self-Esteem X Condition interaction (see the top panel of Figure 1). In the self-directed condition, LSEs reported lower belonging than HSEs,  $\beta = .46$ ,  $b = .35$ , 95% CI [.22, .49],  $t(237) = 5.08$ ,  $p < .001$ , an effect that reproduces a well-known self-esteem difference in the literature. However, no such self-esteem difference emerged in the other-directed condition,  $\beta = -.01$ ,  $b = -.01$ , 95% CI [-.13, .11],  $t(237) = -.12$ ,  $p = .902$ , and LSEs reported that they personally would experience worse belonging following the compliment than would Jamie,  $\beta = .40$ ,  $b = .72$ , 95% CI [.42, 1.03],  $t(237) = 4.67$ ,  $p < .001$ , suggesting that LSEs do not project their insecurities onto other people.

**Table 1.** Results of hierarchical regressions predicting outcome variables in Experiment 1.

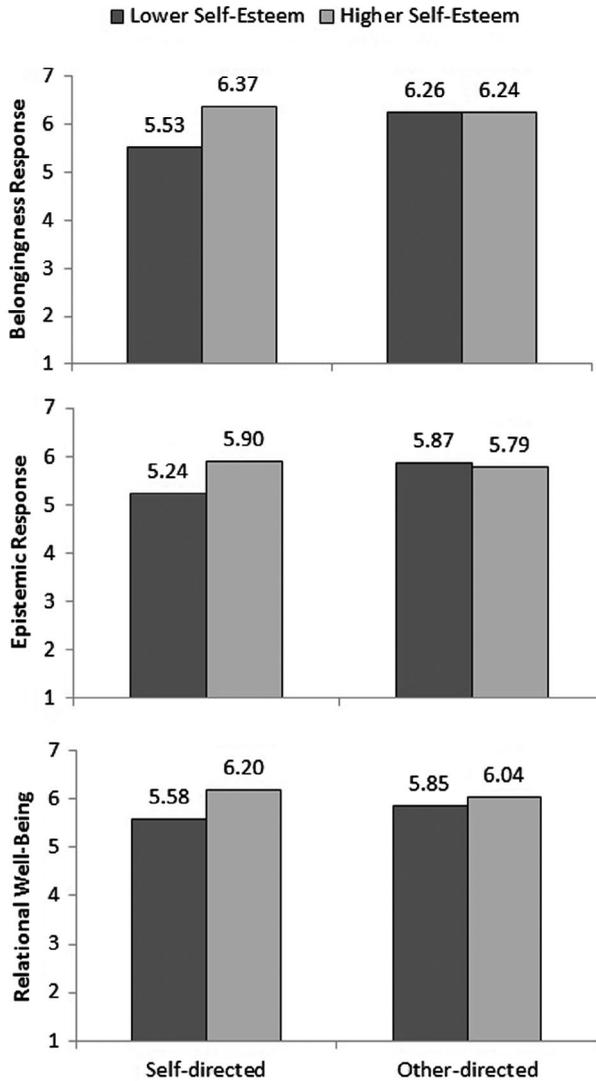
Predictor	$\beta$	$b$	95% CI	$t$	$p$	$\Delta R^2$	$f^2$
Belongingness response							
<i>Step 1</i> (df = 238)							
SE	.20	.15	[.06, .25]	3.19	.002	.07	
Condition	.17	.30	[.52, .08]	2.65	.008		
<i>Step 2</i> (df = 237)							
SE X Condition	-.36	-.36	[-.55, -.18]	-3.88	<.001	.06	.06
Epistemic response							
<i>Step 1</i> (df = 238)							
SE	.15	.10	[.02, .19]	2.42	.016	.05	
Condition	.16	.26	[.06, .46]	2.56	.011		
<i>Step 2</i> (df = 237)							
SE X Condition	-.35	-.32	[-.48, -.15]	-3.77	<.001	.05	.06
Relational well-being							
<i>Step 1</i> (df = 238)							
SE	.20	.16	[.06, .26]	3.19	.002	.04	
Condition	.03	.06	[-.18, .30]	.49	.628		
<i>Step 2</i> (df = 237)							
SE X Condition	-.17	-.18	[-.39, .02]	-1.78	.076	.01	.01

Note: SE = Self-Esteem.

Results of the regressions predicting participants' epistemic response revealed the predicted Self-Esteem X Condition interaction (see the middle panel of Figure 1). The pattern of results mirrored those for the belongingness response: In the self-directed condition, LSEs experienced more epistemic confusion than HSEs,  $\beta = .41$ ,  $b = .28$ , 95% CI [.16, .40],  $t(237) = 4.47$ ,  $p < .001$ , but self-esteem did not predict participants' assessment of the compliment recipient's epistemic response in the other-directed condition,  $\beta = -.05$ ,  $b = -.04$ , 95% CI [-.15, .07],  $t(237) = -.64$ ,  $p = .521$ . Additionally, LSEs reported more epistemic confusion in the self-directed condition than in the other-directed condition,  $\beta = .40$ ,  $b = .63$ , 95% CI [.36, .91],  $t(237) = 4.53$ ,  $p < .001$ , suggesting that LSEs believe that Jamie would respond with more certainty to the feedback than they would.

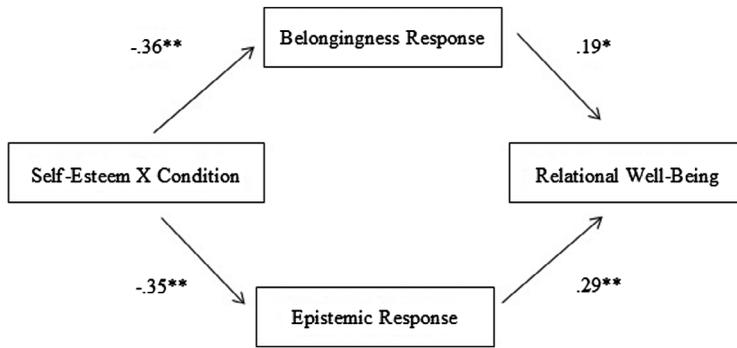
When we used our usual regression to predict relational well-being, the Self-Esteem X Condition interaction was marginally significant (see the bottom panel of Figure 1). Because we had an a priori prediction that LSEs would report lower relational well-being than HSEs in the self-directed but not the other-directed condition, we proceeded with simple effects testing. As expected, LSEs reported lower relational well-being than HSEs in the self-directed condition,  $\beta = .33$ ,  $b = .27$ , 95% CI [.11, .42],  $t(237) = 3.46$ ,  $p = .001$ , but not in the other-directed condition,  $\beta = .10$ ,  $b = .08$ , 95% CI [-.05, .22],  $t(237) = 1.22$ ,  $p = .226$ .

Finally, we tested whether the epistemic response independently explained why LSEs, but not HSEs, experienced worse relational well-being in the self-directed condition compared to the other-directed condition. This is a moderated mediation hypothesis: We propose that a mediator variable (i.e., the epistemic response) explains the association between a predictor variable (i.e., self-esteem) and an outcome variable (i.e., relational well-being) in one experimental condition but not the other. Moreover, our hypothesis stipulates that the moderated mediation path from self-esteem to relational well-being via the epistemic response is independent of a similar indirect path connecting self-esteem and relational well-being via the belongingness response (we did not predict this latter pathway via belongingness; but provided that the epistemic pathway is independent, the result would still



**Figure 1.** Top panel: Belongingness response as a function of condition and self-esteem in Experiment 1. Notes: Middle panel: Epistemic response as a function of condition and self-esteem in Experiment 1. Bottom panel: Relational well-being as a function of condition and self-esteem in Experiment 1. Note. Estimated values were calculated at one standard deviation below (LSEs) and above (HSEs) the sample mean for self-esteem.

support our assertion that LSEs' epistemic needs undermine their relational well-being). This model is depicted in Figure 2, including the standardized path coefficients that were obtained in a series of regressions.<sup>2</sup> When we used Hayes (2013) PROCESS macro for SPSS (Model 7) using 5,000 bootstrap samples to estimate the 95% bias-corrected confidence interval (CI) of the moderated indirect path from self-esteem to relational well-being via the epistemic response (controlling for the belongingness response), the moderated indirect path was statistically significant, indirect path =  $-.05$ ,  $SE = .03$ , 95% CI  $[-.12, -.001]$ , as was the moderated indirect path from self-esteem to relational well-being via the belongingness response (controlling for epistemic response), indirect path =  $-.04$ ,  $SE = .02$ , 95% CI  $[-.10, -.001]$ . These



**Figure 2.** Path model depicting the associations among self-esteem, condition, belongingness response, epistemic response, and relational well-being in Experiment 1.

Note:  $*p < .05$ ;  $**p < .001$ . Main effects of self-esteem and condition on belongingness and epistemic response are not shown, but are reported in Table 1.

results suggest that LSEs' epistemic and belongingness responses to the compliment each independently contributed to LSEs' relatively-poor relational well-being in the self-directed condition.

## Conclusions

These results are consistent with other research revealing that people with negative self-views about their traits or abilities experience lower relational well-being when close others view them more positively than they view themselves (e.g., De La Ronde & Swann, 1998; Swann, De La Ronde, & Hixon, 1994; Swann & Pelham, 2002; however see also Bernichon, Cook, & Brown, 2003; Katz, Beach, & Anderson, 1996). Yet the present research takes previous research a step further by also examining responses to relational-value feedback that is directed towards others. This reveals that LSEs' reactions are not due to some general theory that positive feedback is trite or meaningless. But rather, LSEs' reactions are a distinctly self-oriented process, and that process has important consequences for their relational well-being. Furthermore, and consistent with our overarching hypotheses, LSEs responded to the self-directed feedback in ways that supported their epistemic certainty (e.g., questioning the accuracy of the feedback) at the expense of their relational well-being.

## Experiment 2

In Experiment 2, we build on our first experiment by observing reactions to real relational-value feedback, and by examining behavioral feedback-seeking responses in addition to cognitive and affective responses. First, we provide all participants with general positive relational-value feedback on a bogus personality test. This feedback is self-esteem inconsistent for LSEs, but consistent for HSEs. We then observe participants' subsequent feedback-seeking behavior concerning their social commodities (e.g., sociability, popularity). Social commodities are traits that are easily observed, unambiguously defined, difficult to personally control, and most importantly, strongly associated with acceptance (Anthony, Holmes, & Wood, 2007; Stinson, Wood, & Doxey, 2008). Thus, by observing participants'

feedback-seeking behavior about these traits, we are observing their interest in receiving additional positive relational-value feedback.

We assessed participants' feedback-seeking motivation using an indirect method that has been used in prior research for similar purposes (e.g., vanDellen et al., 2012; DeWall, Baumeister, & Vohs, 2008; Englert & Bertrams, 2013). Participants played the children's game "Operation" and squeezed a handgrip for as long as they could, believing that their performance on these tasks would reveal their relative possession of positive or negative social commodities. Thus, participants' performance on these two tasks would reveal their (most likely non-conscious) motivation to receive the social commodity feedback said to be associated with excelling on the tasks. We used an indirect measure of feedback-seeking motivation because the epistemic system is thought to guide behavior at a non-conscious level (Swann & Schroeder, 1995), and people typically cannot explain psychological processes, including motivation, that occurs non-consciously (Nisbett & Wilson, 1977). This method builds on previous research concerning feedback-seeking behavior, which assesses controlled processes by asking people to choose between different types of feedback (e.g., Giesler, Josephs, & Swann, 1996; Gregg, Hepper, & Sedikides, 2011).

For HSEs, following the receipt of the self-esteem *consistent* positive-relational-value feedback, we predict that they will desire positive feedback more than they will desire negative feedback. Such a preference would be self-verifying, which is a common motivation for people with positive self-views across a range of situations (e.g., Swann & Read, 1981; Swann, Stein-Seroussi, & Giesler, 1992), and would support both their need for self-certainty and their relational well-being. In contrast, for LSEs, following the receipt of the self-esteem *inconsistent* positive-relational-value-feedback, we anticipate one of two possible responses. People who are experiencing self-uncertainty typically respond with either a heightened motivation to seek any-and-all information about the self, regardless of its consistency with existing self-views (i.e., an information-seeking response; e.g., Sedikides & Strube, 1997), or they respond with a heightened motivation to seek information that verifies their existing self-views (i.e., a self-verifying response; e.g., North & Swann, 2009). Thus, following the positive relational-value feedback, we predict that LSEs will either exhibit a heightened preference for both positive and negative feedback (relative to HSEs; an information-seeking response) or they will exhibit a preference for the negative feedback (relative to HSEs and their own desire for positive feedback; a self-verifying response). Either of these response patterns would benefit their needs for self-certainty over their relational-well-being because they would either fail to favor positive feedback or favor negative feedback (and all else being equal, negative feedback is more memorable than positive feedback; e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001).

We also expect self-esteem differences in self-processes. Because LSEs are receiving self-esteem-inconsistent relational-value feedback and generally experience greater self-uncertainty than HSEs (e.g., Campbell, 1990), we predict that LSEs will experience greater self-uncertainty than HSEs in the current study.

## Method

### Participants

We recruited as many participants as we could in two consecutive academic terms, which resulted in a sample of 131 psychology students (90 women, 41 men). One man was excluded

because of technical issues with the computer during data collection leaving 130 participants ( $M_{\text{age}} = 19.33$  years,  $SD_{\text{age}} = 2.09$  years; 92% Canadian born). Sensitivity analyses indicate that with this sample size, 80% power, and  $\alpha = .05$ , we can detect an  $f^2$  of .06 for the critical Self-Esteem x Condition interaction. Participants received partial course credit and a chocolate bar in appreciation for their time.

### Procedure

Participants volunteered for a study on "Personality Styles." At individual lab sessions with a male (for female participants) or female (for male participants) experimenter,<sup>3</sup> participants completed a preliminary questionnaire that included a measure of self-esteem, as well as demographic (e.g., gender; participants indicated if they were "male" or "female") and filler questions to disguise our focus on self-esteem.

Next, participants completed a bogus personality test, which they believed we were validating on behalf of the test's creators (see Stinson et al., 2010, Study 6). The computerized test consisted of 50 innocuous statements about their preferences and behaviors (e.g., "I have no pets," and "I usually sleep on my back"). After participants completed the test, the computer displayed the supposed name of the participants' personality type: *Maranta*. Next, the researcher told participants that they could provide participants with the results from one of the six personality dimensions evaluated by the personality test. The researcher gave participants an official looking document with a cover sheet labeled, "Harvard-Ashby Personality Inventory," followed by "Personality Type Preview: Social Value." The researcher was blind to the contents of the feedback.

The *positive relational-value feedback* indicated that the participants' personality type is well-liked by diverse groups of people, that other people commonly seek out their personality type as friends, teammates, and relationship partners, and that their personality type is perceived to be interesting and engaging conversationalists. The document also cited some of the research that supported these assertions:

In one laboratory study examining face-to-face social interactions among strangers, people reported finding Marantas™ extremely easy to get along with. Partners reported high levels of liking for Marantas™ and a strong desire to get to know them better. Partners also reported really enjoying their interaction with Marantas™ and finding Marantas™ to be interesting and engaging.

After reading the feedback, participants played the game Operation and completed a handgrip task. Operation involves removing thirteen small, irregularly shaped, plastic pieces from their corresponding holes in a board without touching the sides of the holes with tweezers. A buzzer sounds when the sides are touched. Participants were instructed to work as fast as they could without making mistakes and were given three attempts to remove each piece before being instructed to move on to the next piece. They were instructed to remove the pieces in a particular order and were timed from the moment they started attempting to remove the first piece until the moment they removed the final piece. The number of errors made was also noted (see DeWall et al., 2008). Then, participants completed the handgrip task. In this task, participants placed a marble in between the arms of a medium strength handgrip and held the handgrip over a table. They were instructed to hold the handgrip for as long as possible, and were timed from the moment they placed the marble between the grips to the moment when the marble hit the table.

The task framing for these two games constituted the experimental manipulation.<sup>4</sup> Participants assigned to the *positive social commodities condition* learned that performing well on the game of Operation "... is associated with traits that are desirable in relationships, like good social skills. So people who do well on this task also tend to be sociable and popular." Before the handgrip task, participants in this condition were similarly told that, "... performing well on this task is associated with traits that are beneficial to relationships, like having an exciting personality. So people who do well on this task also tend to be quite interesting to talk to and fun." In contrast, participants assigned to the *negative social commodities condition* were told that performing well on the game of Operation "... is associated with traits that are undesirable in relationships, like poor social skills. So people who do well on this task also tend to be shy and unpopular," and that performing well on the handgrip task "... is associated with traits that are detrimental to relationships, like having a dull personality. So people who do well on this task also tend to be less interesting to talk to and inhibited."

Next, participants completed a questionnaire that assessed a variety of outcome measures, including epistemic response, relational well-being, and positive affect. Then, participants completed a shared-value writing task in which they described a value that they share with a close other to ensure that they ended the study in a positive mood (Lomore, Spencer, & Holmes, 2007). Finally, participants were thanked, debriefed concerning the true purposes of the study, and awarded their compensation.

## Measures

**Self-esteem.** Self-esteem was measured using Rosenberg's (1965) Self-Esteem Inventory (9-point scale;  $\alpha = .88$ ).

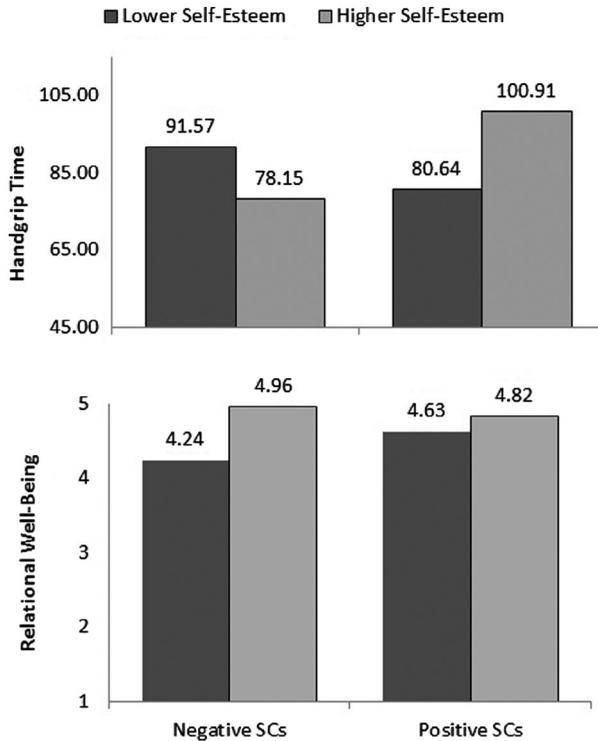
**Epistemic response.** Participants used a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) to indicate their agreement with seven items assessing *self-uncertainty* (e.g., I am wondering about what kind of person I really am; Even if I wanted to, I don't think I could tell someone what I'm really like right now;  $\alpha = .86$ ; adapted from Campbell et al., 1996).

**Relational well-being.** Participants used a 5-point scale (1 = *not at all*, 5 = *very/extremely*) to answer 33 items assessing their mood (adapted from McFarland & Ross, 1982; Watson, Clark, & Tellegen, 1988). Three items in the scale assessed feelings of *relational well-being* (i.e., worthless, inadequate, and unattractive), so these items were reverse-coded and averaged to create a reliable index ( $\alpha = .65$ ).

## Results and discussion

### Feedback-seeking motivation

**Operation.** On the game Operation, shorter times and fewer errors indicated greater motivation to receive feedback, as did longer times spent squeezing the handgrip. We conducted two hierarchical regressions in which length of time spent on the game Operation ( $M_{\text{seconds}} = 113.40$ ,  $SD_{\text{seconds}} = 31.31$ ) and number of errors made on the game ( $M_{\text{errors}} = 6.66$ ,  $SD_{\text{errors}} = 3.75$ ) were regressed onto: Step 1) mean-centered self-esteem ( $M = 7.12$ ,  $SD = 1.16$ ) and dummy-coded task-frame condition (0 = negative social commodity feedback, 1 = positive social commodity feedback); and Step 2) the Self-Esteem X Condition interaction.



**Figure 3.** Top panel: Participants' handgrip time as a function of self-esteem and task-frame condition in Experiment 2.

Notes: Bottom panel: Participants' relational well-being response as a function of self-esteem and task-frame condition in Experiment 2. Note. Estimated values were calculated at one standard deviation below (LSEs) and above (HSEs) the sample mean for self-esteem. SC = Social Commodities.

Neither test revealed any effects.<sup>5</sup>

**Handgrip.** Next, we examined the handgrip time measure ( $M_{\text{seconds}} = 73.22, SD_{\text{seconds}} = 56.94$ ). Preliminary analyses revealed that men held the handgrip for longer than women. So we controlled for gender in our main analyses predicting handgrip time. We regressed handgrip time onto: Step 1) effect-coded gender ( $-1 = \text{women}, 1 = \text{men}$ ); Step 2) mean-centered self-esteem and dummy-coded task-frame condition ( $0 = \text{negative social commodity feedback}, 1 = \text{positive social commodity feedback}$ ); and Step 3) the Self-Esteem X Condition interaction. The anticipated two-way interaction emerged,  $\beta = .23, b = 14.49, 95\% \text{ CI } [1.13, 27.84], t(125) = 2.15, p = .034, \Delta R^2 = .02, f^2 = .04$  (see the top panel of Figure 3). LSEs held the handgrip for the same amount of time in the positive and negative feedback conditions,  $\beta = -.16, b = -17.6, 95\% \text{ CI } [-44.04, 8.77], t(125) = -1.32, p = .189$ , suggesting that they were equally interested in seeking positive and negative feedback about their social commodities. In contrast, HSEs held the handgrip longer in the positive than in the negative feedback condition,  $\beta = .26, b = 29.51, 95\% \text{ CI } [2.86, 56.16], t(125) = 2.19, p = .030$ , suggesting that they were more interested in seeking positive than negative feedback about their social commodities. There was no self-esteem difference in the negative feedback condition,  $\beta = -.12, b = -5.77, 95\% \text{ CI } [-16.05, 4.51], t(125) = -1.11, p = .269$ . However, HSEs held the handgrip longer than LSEs in

**Table 2.** Results of hierarchical regressions predicting epistemic response and relational well-being in Experiment 2.

Predictor	$\beta$	$b$	95% CI	$t$	$p$	$\Delta R^2$	$f^2$
Epistemic response							
<i>Step 1</i> (df = 126)							
SE	-.57	-.39	[-.49, -.29]	-7.84	<.001	.33	
Condition	.07	.12	[-.12, .35]	.99	.323		
<i>Step 2</i> (df = 125)							
SE X Condition	.07	.06	[-.14, .26]	.58	.563	.00	.00
Relational well-being							
<i>Step 1</i> (df = 126)							
SE	.42	.18	[.11, .24]	5.32	<.001	.20	
Condition	.13	.13	[-.03, .28]	1.64	.105		
<i>Step 2</i> (df = 125)							
SE X Condition	-.41	-.22	[-.35, -.09]	-3.43	.001	.07	.09

Note: SE = Self-Esteem.

the positive feedback condition,  $\beta = .18$ ,  $b = 8.72$ , 95% CI [.19, 17.24],  $t(125) = 2.02$ ,  $p = .045$ , suggesting that HSEs were more interested than LSEs in seeking positive feedback about their social commodities.

**Epistemic response and relational well-being.** We conducted two hierarchical regressions in which each dependent measure was regressed onto: Step 1) mean-centered self-esteem and task-frame condition; and Step 2) the Self-Esteem X Condition interaction (see Table 2).<sup>6</sup>

Results revealed a self-esteem main effect for epistemic response ( $M = 2.53$ ,  $SD = .80$ ) that was consistent with the results of Experiment 1 and prior research: LSEs experienced more self-uncertainty than HSEs.

Results also revealed a main-effect of self-esteem for relational well-being ( $M = 4.66$ ,  $SD = .48$ ), indicating that LSEs reported worse relational well-being than HSEs. But these results were qualified by a two-way interaction between self-esteem and condition (see the bottom panel of Figure 2). LSEs experienced worse relational well-being in the negative feedback condition than the positive feedback condition,  $\beta = .50$ ,  $b = .49$ , 95% CI [.23, .74],  $t(125) = 3.79$ ,  $p < .001$ . In contrast, HSEs actually tended to experience better relational well-being in the negative feedback condition than in the positive feedback condition,  $\beta = -.25$ ,  $b = -.24$ , 95% CI [-.49, .02],  $t(125) = -1.84$ ,  $p = .069$ . Furthermore, the self-esteem effect was much larger in the negative feedback condition,  $\beta = .74$ ,  $b = .31$ , 95% CI [.21, .41],  $t(125) = 6.18$ ,  $p < .001$ , than in the positive feedback condition,  $\beta = .21$ ,  $b = .09$ , 95% CI [.004, .17],  $t(125) = 2.07$ ,  $p = .040$ .

Importantly, although participants' general positive affect (average of the other mood items we assessed, negative items reverse-coded;  $\alpha = .86$ ;  $M = 3.89$ ,  $SD = .36$ ) revealed a similar (but weaker) two-way interaction between self-esteem and condition,  $\beta = -.29$ ,  $b = -.12$ , 95% CI [-.21, -.02],  $t(125) = -2.39$ ,  $p = .018$ ,  $\Delta R^2 = .04$ ,  $f^2 = .05$ , relational well-being and general positive affect were only modestly correlated ( $r = .33$ ,  $p < .001$ ), and controlling for positive affect in the regression predicting relational well-being did not change the results that are presented in Table 2 in any substantive manner. Thus, participants' feelings of relational well-being were distinct from their general affective response to the feedback-seeking context.

## Conclusions

The most notable self-esteem difference to emerge from this study is HSEs' strong interest, and LSEs' relative disinterest, in pursuing positive feedback about their social commodities, as evidenced by their differing performance on the handgrip task in the positive feedback condition. Consistent with our hypothesis, after receiving positive relational-value feedback from a personality test, HSEs prefer to seek positive feedback over negative feedback, and they prefer to avoid negative feedback much more than LSEs do. This self-verifying response appears to benefit HSEs' relational well-being, as evidenced by their high relational well-being in both feedback conditions. In contrast, after receiving positive relational-value feedback, LSEs did not appear to distinguish between the two types of feedback (although the means trended in the direction of favoring negative feedback). This result is consistent with an information-seeking response (Sedikides & Strube, 1997). Moreover, LSEs' failure to reject negative feedback appears to have negative consequences for their relational well-being, which was particularly poor in the negative feedback condition. This pattern of results is consistent with our hypothesis that LSEs prioritize their epistemic needs (i.e., the information-seeking drive) over their belongingness needs when they respond to relational-value feedback.

Our results are consistent with previous research that has considered people's responses to feedback, or pursuit of feedback, about social commodities such as likability (Hixon & Swann, 1993; Morling & Epstein, 1997; Swann & Read, 1981), "interestingness" (Hixon & Swann, 1993; Swann, Hixon, Stein-Seroussi, & Gilbert, 1990), "social skills" (De La Ronde & Swann, 1998; Silvera & Neilands, 2004; Swann, Griffin, Predmore, & Gaines, 1987), self-liking and self-competence (Bosson & Swann, 1999; Morling & Epstein, 1997), social competence (Bernichon et al., 2003; Brown, 2010; De La Ronde & Swann, 1998; Giesler et al., 1996; MacDonald, Saltzman, & Leary, 2003; Swann, Wenzlaff, Krull, & Pelham, 1992; Swann et al., 1987); and sociability (Bernichon et al., 2003; Hixon & Swann, 1993; MacDonald et al., 2003; Swann et al., 1990). This previous research tends to find that people with highly positive self-views prefer positive feedback to negative feedback, whereas people with highly negative self-views prefer negative feedback to positive feedback, despite feeling better after receiving positive feedback (e.g., Swann et al., 1987). Our research extends these previous findings in a few important ways. We demonstrate that LSEs' unwillingness to pursue positive feedback is evident at a more uncontrolled level, rather than the more controlled level assessed in previous research. We also show that global self-esteem, rather than specific self-views, predicts feedback-seeking behavior (most of the prior research used specific self-views to predict such behavior). And finally, because we did not use a forced-choice paradigm to assess feedback seeking, our research suggests that LSEs can demonstrate an information-seeking response to self-esteem inconsistent feedback, rather than a purely self-verifying response, a result that bears further investigation in future research.

It is possible, however, that the present results depend on the type of feedback that participants were able to pursue. Compared to HSEs, LSEs are less clear about their possession of social commodities than other qualities (Stinson et al., 2008) and are less willing to claim possession of social commodities (Anthony et al., 2007). In the present study, this lack of clarity and willingness was evident in LSEs' greater self-uncertainty than HSEs, and may have also explained why LSEs were equally interested in receiving positive and negative feedback. Furthermore, because all participants were offered positive relational-value feedback in the initial personality survey, we do not know how LSEs will respond to self-esteem consistent

feedback or how HSEs will respond to self-esteem inconsistent feedback. Our next experiment addresses these concerns.

### Experiment 3

In our final experiment, we first provide participants with the same positive relational-value feedback that we used in Experiment 2, or we provide them with moderate (equivocal) feedback about their general relational value.<sup>7</sup> Then, we use the same methods from Experiment 2 to observe their feedback-seeking behavior, but this time participants have the opportunity to pursue additional positive or negative feedback about their *communal qualities*.

Communal qualities are valued relational qualities such as kindness, warmth, and responsiveness (Anthony et al., 2007). These traits are difficult to observe, ambiguously defined, thought to be easy to control, and most importantly, they are strongly associated with acceptance (Anthony et al., 2007; Stinson et al., 2008). Thus, by observing participants' feedback-seeking behavior about communal qualities, we are observing their interest in receiving additional positive relational-value feedback.

Prior research hints that communal qualities may be a domain of personal resilience for LSEs, such that they may respond to feedback about those traits in ways that benefit their relational well-being (Anthony et al., 2007). For example, in one experiment, when LSEs received positive feedback about their communal qualities from a trusted romantic partner, they incorporated that positive feedback into their self-view (Stinson et al., 2010). Thus, it may be possible for LSEs to pursue positive feedback about their communal qualities without compromising their need for self-certainty.

Consistent with our predictions in Experiment 2, we predict that HSEs will generally desire additional positive feedback about their communal qualities more than they will desire additional negative feedback about those traits. But we also predict that this self-verifying reaction will be stronger following the self-esteem *inconsistent* (moderate) relational-value feedback than following the self-esteem *consistent* (positive) relational-value feedback. This is because the initial self-esteem inconsistent feedback should cause epistemic discomfort that strengthens HSEs' motivation to self-verify.

Because communal qualities represent a domain of personal strength for LSEs, our predictions for LSEs diverge from our predictions in Experiment 2. In contrast to how LSEs responded to the opportunity to gain knowledge about their social commodities in Experiment 2, this time we predict that LSEs in the self-esteem *inconsistent* (positive) relational-value feedback condition will desire additional positive feedback about their communal qualities more than they will desire additional negative feedback about those traits. If this is true, then we expect that LSEs may not experience the same decrements to relational well-being (relative to HSEs) that we observed in Experiments 1 and 2. We remain agnostic concerning LSEs' response to the self-esteem *consistent* (moderate) relational-value feedback.

### Method

#### Participants

We recruited as many participants as we could in three consecutive academic terms (with one summer break), which resulted in a sample of 260 psychology students (128 women,

132 men). One man was excluded because he completed the final questionnaire before experiencing the task-frame manipulation leaving 259 participants ( $M_{\text{age}} = 19.29$  years,  $SD_{\text{age}} = 2.38$  years; 98% Canadian born). Sensitivity analyses indicate that with this sample size, 80% power, and  $\alpha = .05$ , we can detect an  $f^2$  of .03 for the critical Self-Esteem x Relational-Value Feedback X Task-Frame interaction. Participants received partial course credit and a chocolate bar in appreciation of their time.

### Procedure

The procedure was the same as Experiment 2 except for two key changes.<sup>8</sup> First, participants were randomly assigned to receive either moderate relational-value feedback or positive relational-value feedback on the bogus personality test. The researcher was blind to the type of feedback received. The *positive relational-value feedback* was the same as that used in Experiment 2. The *moderate relational-value feedback* indicated that the participants' personality type is liked by only select groups of people, that other people sometimes seek out their personality type as friends, teammates, and relationship partners, and that their personality type is perceived to be moderately interesting and engaging conversationalists (see Stinson et al., 2010, Study 6, for more details). The document also cited some of the research that supported these assertions:

In one laboratory study examining face-to-face social interactions among strangers, some people reported that Marantas™ were easy to get along with, but others found them difficult to interact with. Partners generally reported moderate levels of liking for Marantas™, and an equivocal desire to get to know them better. Partners also reported somewhat enjoying their interaction with Marantas™, and found Marantas™ to be slightly interesting and engaging.

Second, we changed the task framing of the game Operation and the handgrip task such that performance on the tasks was said to reveal participants' relative possession of communal qualities. Participants assigned to the *negative communal qualities condition* were told that performing well on the game of Operation "...is associated with traits that are undesirable in relationships, like being picky and socially insensitive. So people who do well on this task also tend to be quite picky and insensitive," and that performing well on the handgrip task "...is associated with traits that are detrimental to relationships, like being stubborn. So people who do well on this task also tend to be quite stubborn." In contrast, participants assigned to the *positive communal qualities condition* were told that performing well on the game of Operation "... is associated with traits that are desirable in relationships, like empathy and social sensitivity. So people who do well on this task also tend to be quite empathetic and sensitive," and that performing well on the handgrip task "...is associated with traits that are beneficial to relationships, like being committed. So people who do well on this task also tend to be quite committed to their relationships."<sup>9</sup>

Next, participants completed the same questionnaire as Experiment 2 that assessed epistemic response and relational well-being. Then they completed the same shared-value writing task as Experiment 2 before being thanked, debriefed concerning the true purposes of the study, and awarded their compensation.

### Measures

Participants completed the same measures of self-esteem ( $\alpha = .88$ ), epistemic response ( $\alpha = .86$ ), and relational well-being ( $\alpha = .70$ ) that were described in Experiment 2.

## Results and discussion

### Feedback-seeking motivation

Preliminary analyses indicated that gender predicted performance on the Operation and handgrip tasks, so we included gender as a control variable in the analyses that we report concerning those dependent measures.

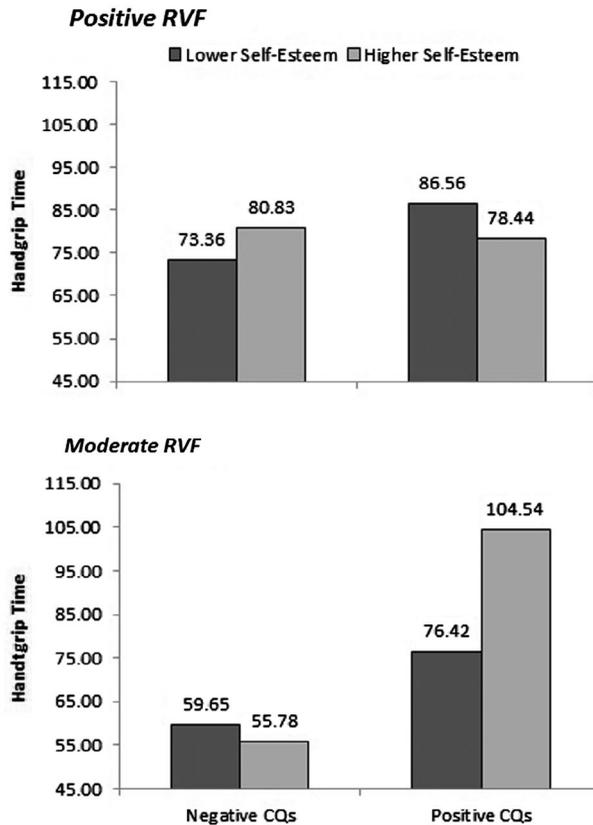
#### Operation

We conducted two hierarchical regressions in which length of time spent on the game Operation ( $M_{\text{seconds}} = 107.38$ ,  $SD_{\text{seconds}} = 30.57$ ) and number of errors made on the game ( $M_{\text{errors}} = 7.86$ ,  $SD_{\text{errors}} = 3.89$ ) were regressed onto: Step 1) effect-coded gender ( $-1 = \text{women}$ ,  $1 = \text{men}$ ); Step 2) mean-centered self-esteem ( $M = 7.03$ ,  $SD = 1.21$ ), dummy-coded relational-value feedback condition ( $0 = \text{moderate relational-value feedback}$ ,  $1 = \text{positive relational-value feedback}$ ), and dummy-coded task-frame condition ( $0 = \text{negative communal quality feedback}$ ,  $1 = \text{positive communal quality feedback}$ ); Step 3) the two-way interactions; and Step 4) the three-way interaction. In addition to the main effect of gender on Operation time, such that men took longer to complete the game than women,  $\beta = .30$ ,  $b = 9.10$ , 95% CI [5.52, 12.69],  $t(256) = 5.00$ ,  $p < .001$ , there was a main effect of task-frame, such that participants in the positive communal quality condition took longer to complete the game than those in the negative communal quality condition,  $\beta = .14$ ,  $b = 8.51$ , 95% CI [1.38, 15.65],  $t(253) = 2.35$ ,  $p = .020$ .

Additionally, a Self-Esteem X Relational-Value feedback condition interaction emerged for the number of errors made on the game. There was no main effect of task-frame condition or interactions with this variable, so to conserve power in this complex regression model, we tested a model that excluded task-frame condition and its interactions (following Judd & Kenny, 1981). A main effect of self-esteem emerged,  $\beta = -.14$ ,  $b = -.46$ , 95% CI [-.85, -.07],  $t(254) = -2.31$ ,  $p = .022$ , as did the Self-Esteem X Relational-Value feedback condition interaction,  $\beta = -.28$ ,  $b = -1.19$ , 95% CI [-1.97, -.41],  $t(253) = -3.01$ ,  $p = .003$ ,  $\Delta R^2 = .03$ ,  $f^2 = .04$ . Whereas HSEs performed marginally better in the positive ( $M_{\text{est}} = 6.79$ ) compared to the moderate ( $M_{\text{est}} = 8.03$ ) relational-value feedback conditions,  $\beta = -.16$ ,  $b = -1.24$ , 95% CI [-2.58, .10],  $t(253) = -1.83$ ,  $p = .069$ , LSEs made more errors in the positive ( $M_{\text{est}} = 9.13$ ) compared to the moderate ( $M_{\text{est}} = 7.48$ ) relational-value feedback conditions,  $\beta = .21$ ,  $b = 1.65$ , 95% CI [.31, 2.99],  $t(253) = 2.43$ ,  $p = .016$ . Thus, participants performed the worst after receiving the self-esteem inconsistent relational-value feedback (i.e., moderate feedback for HSEs and positive feedback for LSEs), regardless of the task framing. This pattern of results is best explained by the fact that self-esteem inconsistent feedback causes epistemic confusion, which in turn induces a cognitive load (Swann et al., 1990) that interferes with performance on this difficult task.

#### Handgrip

We regressed handgrip time ( $M_{\text{seconds}} = 78.41$ ,  $SD_{\text{seconds}} = 49.39$ ) onto: Step 1) effect-coded gender; Step 2) mean-centered self-esteem, dummy-coded relational-value feedback condition, and dummy-coded task-frame condition; Step 3) the two-way interactions; and Step 4) the three-way interaction. Results revealed the main effect of gender,  $\beta = .51$ ,  $b = 25.10$ , 95% CI [19.88, 30.32],  $t(256) = 9.47$ ,  $p < .001$ , indicating that men held the handgrip for longer than women. The predicted three-way interaction also emerged,  $\beta = -.25$ ,  $b = -19.64$ , 95%



**Figure 4.** Top panel: Participants' handgrip time as a function of self-esteem and task-frame condition for participants in the positive relational-value feedback condition in Experiment 3.

Notes: Bottom panel: Participants' handgrip time as a function of self-esteem and task-frame condition for participants in the moderate relational-value feedback condition in Experiment 3. Note. Estimated values were calculated at one standard deviation below (LSEs) and above (HSEs) the sample mean for self-esteem. RVF = Relational-value feedback. CQ = Communal Qualities.

CI  $[-36.97, -2.30]$ ,  $t(249) = -2.23$ ,  $p = .027$ ,  $\Delta R^2 = .01$ ,  $f^2 = .02$ . This interaction is depicted in Figure 4.

Simple-effects testing for HSEs revealed the anticipated interaction between relational-value feedback condition and task-frame condition,  $\beta = -.48$ ,  $b = -51.15$ , 95% CI  $[-80.68, -21.62]$ ,  $t(249) = -3.41$ ,  $p = .001$ . HSEs' handgrip times did not vary as a function of task-frame in the positive relational-value feedback condition,  $\beta = -.02$ ,  $b = -2.39$ , 95% CI  $[-20.76, 15.99]$ ,  $t(249) = -.26$ ,  $p = .798$ . However, moderate relational-value feedback caused HSEs to both decrease their handgrip time in the negative communal qualities condition,  $\beta = .25$ ,  $b = 25.05$ , 95% CI  $[3.38, 46.72]$ ,  $t(249) = 2.28$ ,  $p = .024$ , and increase their handgrip time in the positive communal qualities condition,  $\beta = -.26$ ,  $b = -26.10$ , 95% CI  $[-46.18, -6.02]$ ,  $t(249) = -2.56$ ,  $p = .011$ . Thus, as predicted, after they received the self-esteem inconsistent moderate relational-value feedback, HSEs held the handgrip much longer when they thought that their performance was indicative of positive communal qualities than when they thought their performance was indicative of negative communal qualities,  $\beta = .49$ ,  $b = 48.76$ , 95% CI  $[25.64, 71.88]$ ,  $t(249) = 4.15$ ,  $p < .001$ . Taken together, this pattern of effects is consistent with our

hypothesis that self-esteem-inconsistent (moderate) relational-value feedback strengthens HSEs' motivation to self-verify by seeking additional positive feedback and avoiding negative feedback about themselves.

Simple-effects testing for LSEs revealed two main effects. There was a main effect of relational-value feedback,  $\beta = .23$ ,  $b = 23.39$ , 95% CI [5.54, 41.23],  $t(250) = 2.58$ ,  $p = .010$ , such that LSEs held the handgrip longer after receiving positive compared to moderate relational-value feedback. This suggests that LSEs were most interested in seeking additional feedback, regardless of its valence, following the self-esteem-inconsistent (positive) relational-value feedback. Such a feedback-seeking response to self-esteem inconsistent feedback is consistent with the results for LSEs in Experiment 2. There was also a main effect of task-frame,  $\beta = .31$ ,  $b = 30.41$ , 95% CI [11.06, 49.77],  $t(250) = 3.09$ ,  $p = .002$ , such that LSEs held the handgrip longer when they thought their performance was indicative of positive communal qualities than when they thought their performance was indicative of negative communal qualities. As can be seen in Figure 4, when these two main effects are considered together, LSEs were most interested in pursuing positive feedback about their communal qualities when they had previously received self-esteem-inconsistent (positive) relational-value feedback.

### *Epistemic response and relational well-being*

Next, we regressed the epistemic response ( $M = 2.65$ ,  $SD = .82$ ) onto: Step 1) mean-centered self-esteem, relational-value feedback condition, and task-frame condition; Step 2) the two-way interactions; and Step 3) the three-way interaction (see Table 3).<sup>10</sup> Only the Self-Esteem X Relational-Value feedback condition interaction emerged. There was no significant main effect of task-frame condition or interactions with this variable. Therefore, to conserve power, we excluded task-frame condition and its interactions from the model. A main effect of self-esteem emerged,  $\beta = -.52$ ,  $b = -.35$ , 95% CI [-.42, -.28],  $t(256) = -9.74$ ,  $p < .001$ , as did the Self-Esteem X Relational-Value feedback condition interaction,  $\beta = -.24$ ,  $b = -.21$ , 95% CI [-.35, -.07],  $t(255) = -2.93$ ,  $p = .004$ ,  $\Delta R^2 = .02$ ,  $f^2 = .03$ . LSEs experienced greater feelings of self-uncertainty than HSEs in both conditions, and this discrepancy was larger after receiving positive, and for LSEs, self-esteem inconsistent, relational-value feedback on the personality test,  $\beta = -.64$ ,  $b = -.44$ , 95% CI [-.53, -.35],  $t(254) = -9.48$ ,  $p < .001$ , and smaller after receiving moderate relational-value feedback on the personality test,  $\beta = -.33$ ,  $b = -.23$ , 95% CI [-.34, -.12],  $t(254) = -4.05$ ,  $p < .001$ . HSEs also experienced heightened feelings of self-uncertainty after the moderate relational-value feedback compared to the positive initial relational-value feedback,  $\beta = -.25$ ,  $b = -.43$ , 95% CI [-.67, -.20],  $t(254) = -3.41$ ,  $p = .001$ . Thus, there is evidence that both LSEs and HSEs experienced stronger feelings of epistemic uncertainty after receiving self-esteem-inconsistent relational-value feedback on the personality test.

When we used the same regression model to predict relational well-being ( $M = 4.61$ ,  $SD = .53$ ), the expected main-effect of self-esteem emerged, such that HSEs reported better well-being than LSEs (see Table 3). The anticipated three-way interaction was only marginally-significant. However, because we had a priori hypotheses (i.e., we expected that LSEs would differ from HSEs on this variable), we proceeded to decompose the interaction with simple-effects testing. As predicted, whereas HSEs always experienced high relational well-being, ( $M_{\text{est}} = 4.86$ ), LSEs' relational well-being varied as a function of task-frame and relational-value feedback condition,  $\beta = .33$ ,  $b = .38$ , 95% CI [.05, .72],  $t(250) = 2.23$ ,  $p = .026$ . The type of relational-value feedback that participants received on the personality test did

**Table 3.** Results of hierarchical regressions predicting epistemic response and relational well-being in Experiment 3.

Predictor	$\beta$	$b$	95% CI	$t$	$p$	$\Delta R^2$	$f^2$
Epistemic response							
Step 1 (df = 254)						.27	
SE	-.50	-.34	[-.41, -.27]	-9.30	< .001		
Relational-value feedback	-.11	-.17	[-.35, .00]	-1.95	.053		
Task-frame	-.03	-.05	[-.22, .12]	-.57	.568		
Step 2 (df = 251)						.03	.04
SE X Relational-value feedback	-.05	-.05	[-.21, .11]	-.61	.540		
SE X Task-frame	-.17	-.18	[-.34, -.03]	-2.30	.022		
Relational-value feedback X Task-frame	.03	.06	[-.32, .44]	.31	.753		
Step 3 (df = 250)						.00	.01
SE X Relational-value feedback X Task-frame	.14	.18	[-.11, .47]	1.23	.222		
Relational Well-Being							
Step 1 (df = 254)						.23	
SE	.47	.21	[.16, .26]	8.39	< .001		
Relational-value feedback	.10	.10	[-.02, .22]	1.72	.086		
Task-frame	-.05	-.05	[-.17, .06]	-.91	.364		
Step 2 (df = 251)						.01	.01
SE X Relational-value feedback	-.09	-.05	[-.15, .05]	-1.04	.300		
SE X Task-frame	-.03	-.02	[-.12, .08]	-.45	.653		
Relational-value feedback X Task-frame	.14	.16	[-.08, .40]	1.29	.197		
Step 3 (df = 250)						.01	.01
SE X Relational-value feedback X Task-frame	-.22	-.19	[-.38, .01]	-1.86	.065		

Note: SE = Self-Esteem.

not influence LSEs' relational well-being in the negative communal qualities condition (moderate feedback  $M_{\text{est}} = 4.38$ , positive feedback  $M_{\text{est}} = 4.37$ ),  $\beta = -.01$ ,  $b = -.01$ , 95% CI [-.23, .22],  $t(250) = -.07$ ,  $p = .948$ . In contrast, in the positive communal qualities condition, LSEs experienced better relational well-being if they had previously received self-esteem inconsistent (positive) feedback ( $M_{\text{est}} = 4.50$ ) than if they had previously received self-esteem consistent (moderate) feedback ( $M_{\text{est}} = 4.12$ ),  $\beta = .35$ ,  $b = .38$ , 95% CI [.12, .63],  $t(250) = 2.92$ ,  $p = .004$ .<sup>11</sup>

This pattern of results for relational well-being is most readily interpreted in light of the previous results for handgrip time and epistemic response. Recall that the handgrip results indicated that LSEs were motivated to pursue positive feedback about their communal qualities in both relational-value feedback conditions (see Figure 4). Recall also that LSEs experienced more epistemic confusion in the positive relational-value feedback condition than in the negative relational-value feedback condition. Thus, LSEs experienced the best relational well-being when they pursued positive feedback while they were feeling uncertain about their self-views. In contrast, LSEs experienced the worst relational well-being when they attempted to pursue positive feedback while they were feeling (relatively) confident about their existing self-views. These results are consistent with our overarching hypothesis that LSEs' epistemic response to feedback can undermine their relational well-being – in this case, LSEs' feelings of self-certainty in response to moderate relational-value feedback appeared to undermine their ability to benefit from their attempts to pursue positive feedback about their communal qualities.

## General discussion

The results of three experiments converge to demonstrate that HSEs react to relational-value feedback in ways that support both their need for self-certainty and their relational well-being, whereas LSEs often react to feedback in ways that support their need for self-certainty at the expense of their relational well-being.

Across all three experiments, HSEs consistently embraced positive feedback and avoided negative feedback, a pattern of responses that was associated with uniformly-high relational well-being. These results suggest that HSEs actively curate their social environment to provide a steady supply of positive feedback, a habit that likely bolsters their already-high self-esteem and supports their well-being. Indeed, it is exactly this kind of social-psychological bias that has led researchers to claim that high self-esteem is a source of psychological resilience, allowing people to better cope with adversity (e.g., DeLongis, Folkman, & Lazarus, 1988).

In contrast, our first experiment demonstrated that LSEs responded to a compliment from a romantic partner with heightened feelings of epistemic confusion, which uniquely predicted decrements in relational well-being compared to HSEs. In our second experiment, LSEs' information-seeking response to positive relational-value feedback led them to pursue both positive and negative feedback about the self. In turn, their failure to avoid negative feedback, as HSEs do, was associated with reduced relational well-being.

Our third experiment once again revealed that LSEs exhibit an information-seeking response to positive relational-value feedback: They became more interested in receiving both positive *and* negative feedback about the self. However, LSEs also expressed a preference for positive feedback over negative feedback, which in the case of communal qualities, also reflects a self-verifying response for LSEs – albeit a much weaker self-verifying response than HSEs demonstrated. Moreover, LSEs' feedback-seeking behavior in our third experiment had a mixed effect on their relational well-being. On the one hand, LSEs experienced decreased relational well-being when they sought positive feedback while they were experiencing epistemic certainty (i.e., in the moderate relational-value feedback condition). This response helps to explain why positive self-statements like “I am a lovable person” can backfire for LSEs, resulting in decreased relational well-being (Wood, Perunovic, & Lee, 2009, p.863). Apparently, LSEs' epistemic needs can block their ability to benefit from positive feedback generated by both the self and others.

On the other hand, the results of Experiment 3 also revealed that LSEs experienced heightened relational well-being when they sought positive feedback while they were experiencing epistemic confusion (i.e., in the positive relational-value feedback condition). This suggests that LSEs can benefit from the opportunity to pursue positive feedback in very specific circumstances: they must be afforded the opportunity to pursue positive feedback regarding a domain of traits about which they already hold positive self-evaluations (e.g., communal qualities), and that opportunity must occur at a time when they are feeling particularly uncertain about their existing self-views. Such a perfect storm of circumstance is probably uncommon in LSEs' daily lives, a reality that may help to explain why LSEs suffer generally worse relational well-being than HSEs.

However, it may be possible to develop simple, social-psychological interventions that foster just such a set of circumstances. Though it is notoriously difficult to identify factors that can improve self-esteem over time, one such factor is being in a relationship with a

partner who holds positive illusions about their lower self-esteem partner's traits (Murray, Holmes, & Griffin, 1996). Presumably, being in a relationship with such a partner would provide LSEs with a steady stream of self-esteem inconsistent, positive relational-value feedback. Such feedback could induce chronic epistemic confusion, priming the pump for self-change. Moreover, LSEs in high quality relationships often react to acute insecurity by performing routine chores for their romantic partner (Murray et al., 2009), which one could say expresses their kind and caring nature. In turn, LSEs' caregiving efforts are noticed and appreciated by their romantic partners, and thereby LSEs' personal strengths are verified. Thus some LSEs may enjoy that rare but perfect storm of beneficial social circumstances that were identified in the current research, and when they do, they appear to enjoy increases in self-esteem over time. If researchers could develop interventions to encourage those kinds of relationships for LSEs, such an intervention could potentially improve LSEs' relational well-being. Future research should explore this promising possibility.

### ***What about the game operation?***

In Experiments 2 and 3, both self-esteem and our feedback manipulations influenced performance on the hand-grip task but not on the game Operation. We did observe that participants made more errors in Experiment 3 when they were experiencing epistemic confusion, but there were no other effects for this variable. It is possible that performance on the game Operation involves a greater degree of individual variance in motor skill (i.e., hand-eye coordination) than performance on a handgrip, and such individual differences obscured our ability to consistently detect self-esteem or condition effects. We also instructed participants to be both quick and accurate, and such a mixed message could have introduced significant error variance if participants interpreted this instruction differently based on idiosyncratic factors. But we are not the only researchers to observe weak or null effects on this kind of task. Other researchers conducting similar research and using similar instructions (albeit with much smaller sample sizes) have also achieved inconsistent results using the game, sometimes finding that timing on the game drives results and other times finding that errors made on the game drives results (e.g., vanDellen et al., 2012; DeWall et al., 2008). We conclude that this type of task is not well-suited to measuring people's feedback-seeking motivations.

### ***Is the handgrip really an uncontrolled task?***

We decided to use indirect measures of feedback-seeking motivation because the epistemic system is thought to influence behavior at the non-conscious, uncontrolled level of processing. Thus, we sought to assess a non-conscious process with tasks that might readily reveal non-conscious motivations. Yet it is still possible that controlled processes influenced handgrip performance in our experiments. Although it might be difficult to consciously deliver an exceptional performance on a task like the handgrip, it would be relatively easy to consciously "take a dive" and perform poorly. Thus, HSEs' generally-poor performance in the negative feedback conditions of Experiments 2 and 3 could reflect a non-conscious or a conscious desire to reject negative feedback. It is interesting to note that between 95% and 98% of participants reported that they tried "moderately hard" to "very hard" on the handgrip task, and these reports did not systematically vary as a function of self-esteem or

experimental condition the way that actual performance varied (see supplemental materials for these analyses). These results suggest that handgrip performance may have been uncontrolled. Yet it is also possible that participants were not being honest about their efforts. Our data do not allow us to tease apart these possibilities.

Fortunately, such ambiguity does not undermine our results; our theorizing did not depend on whether the outcomes we predicted were deliberate or reflexive. Such questions remain important avenues for future research. There is evidence that the epistemic drive can operate at the uncontrolled level (e.g., Swann & Schroeder, 1995), and there is also evidence that people are aware of their desire for self-verifying feedback (see Swann, 1997). At the very least, the fact that we can measure epistemic confusion with self-reports suggests that people can sense when their epistemic drive is activated. Thus it appears that a dual process model best describes the functioning of the epistemic drive system: The drive for self-certainty can operate at both the controlled/conscious level and at the uncontrolled/non-conscious level (Swann & Brooks, 2012). Importantly, risk-regulation theorists have proposed a similar dual process account of the drive for belongingness (Murray, Derrick, Leder, & Holmes, 2008). Future research should attempt to further specify the controlled and uncontrolled aspects of these two important drive systems, and elucidate the ways in which they may interact at both the controlled and uncontrolled levels to predict behavior.

## Conclusions

The research we have described helps elucidate the roles of both epistemic and belongingness needs in driving the search for, and response to, social feedback. This research demonstrates that LSEs' reactions to relational-value feedback are self-motivated; that LSEs' epistemic reactions to relational value feedback can undermine their well-being; and that LSEs' well-being can benefit from the opportunity to pursue positive feedback about a domain of personal strength. These novel findings inform psychological science concerning the stability of self-esteem over time and suggest methods for improving LSEs' relational well-being.

## Notes

1. Although we expected small-medium-sized effects based on a meta-analysis of published self-verification effects (Kwang & Swann, 2010), we did not conduct a priori power analyses before conducting Experiments 1–3 (the exception being the second term of data collection in Experiment 1; see the supplemental materials).
2. The regression equations that we used to derive the path coefficients depicted in Figure 2 are as follows. Regression 1: self-esteem, condition, and the interaction predicting the epistemic response. Regression 2: self-esteem, condition, and the interaction predicting the belongingness response. Regression 3: self-esteem, condition, the interaction term, epistemic response, and the belongingness response predicting relational well-being.
3. Undergraduate research assistants who were a different gender than the participants were involved in the present study to make salient the relational-value feedback in the stimulus and in the motivational tasks. We thought that having a different-gender experimenter would make relational-value more salient, because the experimenter could be viewed as a potential partner for some and a reminder of a current partner for others.
4. See Supplemental Materials for diagrams depicting conditions and condition levels for Experiments 2 and 3.

5. Preliminary analyses indicated that gender did not interact with self-esteem or condition. There was a main effect of gender predicting length of time playing Operation indicating that men took longer than women,  $\beta = .20$ ,  $b = 6.60$ , 95% CI [.76, 12.44],  $t(126) = 2.24$ ,  $p = .027$ .
6. Gender did not moderate any of the following results.
7. We provide participants with moderate relational-value feedback instead of low relational-value feedback because LSEs' characteristic self-views are not the inverse of HSEs: "Low" self-esteem in a normative sense is not low in an absolute sense: LSEs do not believe they are truly low in relational value and they do not believe they are utterly lacking in belongingness (Baumeister, Tice, & Hutton, 1989). Rather, as it naturally occurs, low self-esteem reflects doubts about one's relational value and the concern that one's relational value may in fact be low. Therefore, moderate relational-value feedback is more self-esteem-consistent for LSEs than is low relational-value feedback.
8. Despite our concerns about using the game Operation as a dependent measure, and the null results it yielded in Experiment 2, we included it again here because we wanted to keep the procedure as consistent as possible with that of Experiment 2.
9. Astute readers may notice that the types of positive and negative feedback available during the handgrip task are not parallel (i.e., commitment is not similar to stubbornness). Future research should replicate these findings using parallel feedback.
10. Gender did not moderate any of the following results.
11. As in Experiment 2, relational well-being was independent from general positive affect.

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## References

- Anthony, D. B., Holmes, J. G., & Wood, J. V. (2007). Social acceptance and self-esteem: Tuning the sociometer to interpersonal value. *Journal of Personality and Social Psychology*, *92*, 1024–1039.
- Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self-presentational motivations and personality differences in self-esteem. *Journal of Personality*, *57*, 547–579.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*, 323–370.
- Bellavia, G., & Murray, S. (2003). Did I do that? Self-esteem-related differences in reactions to romantic partner's moods. *Personal Relationships*, *10*, 77–95.
- Bernichon, T., Cook, K. E., & Brown, J. D. (2003). Seeking self-evaluative feedback: The interactive role of global self-esteem and specific self-views. *Journal of Personality and Social Psychology*, *84*, 194–204.
- Bosson, J., & Swann, W. B., Jr (1999). Self-liking, self-competence, and the quest for self-verification. *Personality and Social Psychology Bulletin*, *25*, 1230–1241.
- Brown, J. D. (2010). High self-esteem buffers negative feedback: Once more with feeling. *Cognition and Emotion*, *24*, 1389–1404.

- Cameron, J. J., & Granger, S. (2018). Does self-esteem have an interpersonal imprint beyond self-reports? A meta-analysis of self-esteem and objective interpersonal indicators. *Personality and Social Psychology Review*. doi:10.1177/1088868318756532
- Cameron, J. J., Stinson, D. A., Gaetz, R., & Balchen, S. (2010). Acceptance is in the eye of the beholder: Self-esteem and motivated perceptions of acceptance from the opposite sex. *Journal of Personality and Social Psychology*, 99, 513–529.
- Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology*, 59, 538–549.
- Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, 70, 141–156.
- De La Ronde, C., & Swann, W. (1998). Partner verification: Restoring shattered images of our intimates. *Journal of Personality and Social Psychology*, 75, 374–382.
- vanDellen, M. R., Campbell, W. K., Hoyle, R. H., & Bradfield, E. K. (2011). Compensating, resisting, and breaking: A meta-analytic examination of reactions to self-esteem threat. *Personality and Social Psychology Review*, 15, 51–74.
- vanDellen, M. R., Knowles, M. L., Krusemark, E., Sabet, R. F., Campbell, W. K., McDowell, J. E., & Clementz, B. A. (2012). Trait self-esteem moderates decreases in self-control following rejection: An information-processing account. *European Journal of Personality*, 26, 123–132.
- DeLongis, A., Folkman, S., & Lazarus, R. S. (1988). The impact of daily stress on health and mood: psychological and social resources as mediators. *Journal of Personality and Social Psychology*, 54, 486–495.
- DeWall, C., Baumeister, R. F., & Vohs, K. D. (2008). Satiated with belongingness? Effects of acceptance, rejection, and task framing on self-regulatory performance. *Journal of Personality and Social Psychology*, 95, 1367–1382.
- Englert, C., & Bertrams, A. (2013). Too exhausted for operation? Anxiety, depleted self-control strength, and perceptual-motor performance. *Self and Identity*, 12, 650–662. doi:10.1080/15298868.2012.718865
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2017). *GPower version 3.1.9.2* [Computer software]. Retrieved from <http://www.gpower.hhu.de/en.html>
- Giesler, R. B., Josephs, R. A., & Swann, W. B., Jr (1996). Self-verification in clinical depression. *Journal of Abnormal Psychology*, 105, 358–368.
- Gregg, A. P., Hepper, E. G., & Sedikides, C. (2011). Quantifying self-motives: Functional links between dispositional desires. *European Journal of Social Psychology*, 41, 840–852.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press.
- Hixon, J. G., & Swann, W. B., Jr (1993). When does introspection bear fruit? Self-reflection, self-insight, and interpersonal choices. *Journal of Personality and Social Psychology*, 64, 35–43.
- Judd, C. M., & Kenny, D. A. (1981). *Estimating the effects of social interventions*. Cambridge: Cambridge University Press.
- Katz, J., Beach, S. H., & Anderson, P. (1996). Self-enhancement versus self-verification: Does spousal support always help? *Cognitive Therapy and Research*, 20, 345–360.
- Kille, D. R., Eibach, R. P., Wood, J. V., & Holmes, J. G. (2017). Who can't take a compliment? The role of construal level and self-esteem in accepting positive feedback from close others. *Journal of Experimental Social Psychology*, 68, 40–49. doi:10.1016/j.jesp.2016.05.003
- Kwang, T., & Swann, W. R. (2010). Do people embrace praise even when they feel unworthy? A review of critical tests of self-enhancement versus self-verification. *Personality and Social Psychology Review*, 14, 263–280.
- Lemay, E. P., & Dudley, K. L. (2011). Caution: Fragile! Regulating the interpersonal security of chronically insecure partners. *Journal of Personality and Social Psychology*, 100, 681–702.
- Li, N. P., Bailey, J., Kenrick, D. T., & Linsenmeier, J. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, 82, 947–955.
- Lomore, C. D., Spencer, S. J., & Holmes, J. G. (2007). The role of shared-values affirmation in enhancing the feelings of low self-esteem women about their relationships. *Self and Identity*, 6, 340–360.

- MacDonald, G., Saltzman, J. L., & Leary, M. R. (2003). Social approval and trait self-esteem. *Journal of Research in Personality, 37*, 23–40.
- Marigold, D. C., Holmes, J. G., & Ross, M. (2007). More than words: Reframing compliments from romantic partners fosters security in low self-esteem individuals. *Journal of Personality and Social Psychology, 92*, 232–248.
- Marigold, D. C., Cavallo, J. C., Holmes, J. G., & Wood, J. V. (2014). You can't always give what you want: The challenge of providing social support to low self-esteem individuals. *Journal of Personality and Social Psychology, 107*, 56–80.
- McFarland, C., & Ross, M. (1982). Impact of causal attributions on affective reactions to success and failure. *Journal of Personality and Social Psychology, 43*, 937–946.
- Morling, B., & Epstein, S. (1997). Compromises produced by the dialectic between self-verification and self-enhancement. *Journal of Personality and Social Psychology, 73*, 1268–1283.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996). The benefits of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of Personality and Social Psychology, 70*, 79–98.
- Murray, S. L., Rose, P., Bellavia, G. M., Holmes, J. G., & Kusche, A. G. (2002). When rejection stings: How self-esteem constrains relationship-enhancement processes. *Journal of Personality and Social Psychology, 83*, 556–573.
- Murray, S. L., Holmes, J. G., & Collins, N. L. (2006). Optimizing assurance: The risk regulation system in relationships. *Psychological Bulletin, 132*, 641–666.
- Murray, S. L., Derrick, J. L., Leder, S., & Holmes, J. G. (2008). Balancing connectedness and self-protection goals in close relationships: A levels-of-processing perspective on risk regulation. *Journal of Personality and Social Psychology, 94*, 429–459. doi:10.1037/0022-3514.94.3.429
- Murray, S. L., Aloni, M., Holmes, J. G., Derrick, J. L., Stinson, D. A., & Leder, S. (2009). Fostering partner dependence as trust insurance: The implicit contingencies of the exchange script in close relationships. *Journal of Personality and Social Psychology, 96*, 324–348.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231–259.
- North, R. J., & Swann, W. B. (2009). Self-verification 360°: Illuminating the light and dark sides. *Self and Identity, 8*, 131–146.
- Robinson, D. T., & Smith-Lovin, L. (1992). Selective interaction as a strategy for identity maintenance: An affect control model. *Social Psychology Quarterly, 55*, 12–28.
- Rosenberg, M. (1965). *Society and the Adolescent self-image*. Princeton, NJ: Princeton University Press.
- Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, and to thine own self be better. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 209–269). New York, NY: Academic Press.
- Silvera, D. H., & Neilands, T. (2004). Interpreting the uninterpretable: The effect of self-esteem on the interpretation of meaningless feedback. *Scandinavian Journal of Psychology, 45*, 61–66.
- Stinson, D. A., Wood, J. V., & Doxey, J. R. (2008). In search of clarity: Self-esteem and domains of confidence and confusion. *Personality and Social Psychology Bulletin, 34*, 1541–1555.
- Stinson, D. A., Logel, C., Holmes, J. G., Wood, J. V., Forest, A. L., Gaucher, D., ... Kath, J. (2010). The regulatory function of self-esteem: Testing the epistemic and acceptance signaling systems. *Journal of Personality and Social Psychology, 99*, 993–1013.
- Stinson, D. A., Cameron, J. J., Hoplock, L. B., & Hole, C. (2015). Warming up and cooling down: Self-esteem and behavioral responses to social threat during relationship initiation. *Self and Identity, 14*, 189–213.
- Stinson, D. A., Cameron, J. J., & Huang, E. T. (2015). Your sociometer is telling you something: How the self-esteem system functions to resolve important interpersonal dilemmas. In V. Zeigler-Hill, L. Welling, & T. Shackelford (Eds.), *Evolutionary perspectives on social psychology* (pp. 137–147). New York, NY: Springer Publishing.
- Swann, W. B., Jr (1997). The trouble with change: Self-verification and allegiance to the self. *Psychological Science, 8*, 177–180. doi:10.1111/j.1467-9280.1997.tb00407.x
- Swann, W. B., & Brooks, M. (2012). Why threats trigger compensatory reactions: The need for coherence and quest for self-verification. *Social Cognition, 30*, 758–777.

- Swann, W. B., & Pelham, B. (2002). Who wants out when the going gets good? Psychological investment and preference for self-verifying college roommates. *Self and Identity, 1*, 219–233.
- Swann, W. B., & Read, S. (1981). Self-verification processes: How we sustain our self- conceptions. *Journal of Experimental Social Psychology, 17*, 351–372.
- Swann, W. B., & Schroeder, D. G. (1995). The search for beauty and truth: A framework for understanding reactions to evaluations. *Personality and Social Psychology Bulletin, 21*, 1307–1318.
- Swann, W. B., Griffin, J. J., Predmore, S. C., & Gaines, B. (1987). The cognitive–affective crossfire: When self-consistency confronts self-enhancement. *Journal of Personality and Social Psychology, 52*, 881–889.
- Swann, W. B., Jr, Hixon, J. G., Stein-Seroussi, A., & Gilbert, D. T. (1990). The fleeting gleam of praise: Cognitive processes underlying behavioral reactions to self- relevant feedback. *Journal of Personality and Social Psychology, 59*, 17–26. doi:10.1037/0022-3514.59.1.17
- Swann, W. B., Stein-Seroussi, A., & Giesler, R. B. (1992). Why people self-verify. *Journal of Personality and Social Psychology, 62*, 392–401. doi:10.1037/0022-3514.62.3.392
- Swann, W. B., Jr, Wenzlaff, R. M., Krull, D. S., & Pelham, B. W. (1992). Allure of negative feedback: Self-verification strivings among depressed persons. *Journal of Abnormal Psychology, 101*, 293–306.
- Swann, W. B., Jr, De La Ronde, C., & Hixon, G. (1994). Authenticity and positivity strivings in marriage and courtship. *Journal of Personality and Social Psychology, 66*, 857–869.
- Swann, W. R., Chang-Schneider, C., & Larsen McClarty, K. (2007). Do people's self-views matter? Self-concept and self-esteem in everyday life. *American Psychologist, 62*, 84–94.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.
- Wood, J., Perunovic, W., & Lee, J. (2009). Positive self-statements: Power for some, peril for others. *Psychological Science, 20*, 860–866.