Running Head: SHOPPING FOR CONFIRMATION

**Shopping for Confirmation:**

**How Threatening Feedback Leads People to Reshape Their Social Networks**

Paul Green, Jr.

Harvard University

Francesca Gino

Harvard University

Bradley Staats

University of North Carolina

**ABSTRACT**

To improve and advance in their careers, employees must be able to identify their own deficiencies. But humans are notoriously self-deceptive in their self-appraisal efforts, consistently ignoring their flaws in an attempt to maintain a positive self-concept. Aware of this fact, organizations commonly gather various forms of developmental feedback from others in the belief that it will be more honest than self-assessments and motivate self-improvement. We propose that these feedback processes are, in fact, often ineffective because they represent threats to recipients’ positive self-concept. Analyzing four years of peer feedback and social network data from a company in the agribusiness industry, we find that employees, in the face of feedback that is more negative than their own self-assessment in a given domain, reshape their social network in ways designed to eliminate or attenuate the threat brought about by the feedback, and that this behavior is detrimental to their performance. In two follow-up laboratory studies, we replicate these findings conceptually, showing that disconfirming feedback has such effects on one’s relationships and performance because it is perceived as threatening to one’s self-concept.

**Keywords:** Developmental feedback, Self-concept, Positive illusions, Social network, Threat

As the marketplace becomes increasingly competitive, enhancing employee motivation and effort is critical to staying ahead of the competition. To give employees information about the effectiveness of their own work behavior and provide an impetus for improvement, organizations commonly use developmental feedback processes (Murphy & Cleveland, 1995). These feedback processes are intended to provide employees with information about the effectiveness of their own work behavior. Although the design and maintenance of feedback systems are essential for both individual and organizational performance (Fedor, 1991; Kluger & DeNisi, 1996; M. S. Taylor, Fisher, & Ilgen, 1984), and such systems are widely used, the precise means by which feedback affects employee motivation and performance are, to date, still unclear. In fact, as Latham and Locke (1991, p. 224) noted, “few concepts in psychology have been written about more uncritically and incorrectly than that of feedback.”

In this paper, we address calls for critically executed research on the effects of feedback on employees’ performance and relationships at work by exploring how employees experience developmental feedback. Drawing on social psychology research on self-protection (Alicke & Sedikides, 2009; Sedikides & Alicke, 2012), we suggest that employees experience feedback that is inconsistent with their self-views in a specific domain (e.g., leadership skills, creativity) as a threat to their self-concept. We suggest that employees respond to that threat by reshaping their social context in search of less threatening relationships, but with detrimental consequences to one’s work performance. Specifically, we suggest that employees, seeking a social network that will be more flattering and confirming, flee the source of threat to their self-concept brought on by disconfirming feedback by replacing existing relationships with new ones.

Personal improvement is generally thought to require a constant evaluation of one’s deficiencies and a focus on positive change (e.g. Carver & Scheier, 1982). Yet, as humans, we tend to see ourselves in a flattering light, emphasizing the positive aspects the self, and discounting the negative aspects (Kunda, 1987; Sherman & Cohen, 2006; Vaillant, 1995). Consistent with this insight, self-appraisal research suggests that employees do a poor job of evaluating their own performance (Meyer, 1980; Thorton, 1980), handicapping their success as it is difficult to improve without an awareness of one’s shortcomings. By contrast, employees are assumed to gain more insight into their actual behavior and performance via *others’* relatively negative assessments of them (Campbell & Lee, 1988).

But recipients can perceive this negative feedback as threatening when the feedback disconfirms their self-concept. We theorize that people react to the feedback by reshaping their networks—and will perform more poorly as a result. We test this theory in a field study, using four years of peer feedback and social network data collected from a vertically integrated agribusiness and food processing company, as well as in two laboratory studies, which provide causal evidence for our hypotheses and allow us to examine the psychological mechanism explaining the relationship between disconfirming peer feedback and performance.

This paper makes several contributions to the literature. First, we contribute to existing feedback research by examining how feedback that does not confirm employees’ positive self-concept influences their willingness to maintain social ties with feedback-givers. Although some recent behavioral research has explored the psychological effects of negative feedback, this work has generally examined the effects of such feedback on performance in the task domain without considering the broader behavioral effects of peer feedback (Greve, 2003; Ilgen & Davis, 2000; Jordan & Audia, 2012). Here, we suggest that, because an individual’s self-concept is maintained and validated through the social environment, negative feedback will have social effects resulting from the individual drive to cultivate a socially validated environment. Unlike prior work, we focus on how feedback can lead employees to reshape their social networks, with potential costs to their development and performance.

Second, we contribute to existing research by identifying a psychologically important way in which recipients perceive and respond to feedback: whether it confirms or disconfirms their self-views of how well they performed in a certain domain. Unlike typical hypotheses in prior between-individual investigations of the effects of feedback valence on motivation or performance (e.g. Nease, Mudgett, & Quiñones, 1999; Podsakoff & Farh, 1989), our predictions center on feedback valence relative to the recipient’s self-assessment rather than on feedback valence alone. Feedback valence in research contexts is often manipulated by providing study participants with either general positive feedback or negative feedback. By contrast, our predictions refer to feedback that is perceived as negative because it is inconsistent with one’s own appraisal—a feature more characteristic of actual field settings. In our field data, in fact, employees have the opportunity to appraise themselves prior to receiving feedback about their performance from others. These self-evaluations reflect the focal person’s work-related self-concept—a part of the self that is psychologically meaningful to employees—and negative feedback is experienced as a threat to that intrinsically valued self-concept.

Third, our research identifies the psychological mechanism explaining why feedback so often does not yield performance improvements. We argue and find that feedback that disconfirms one’s self-assessment is perceived as threatening to the recipient’s self-concept. Employees flee this threat, or otherwise attempt to mitigate its psychological effects, by altering their social network, damaging the relationship between the feedback giver and the feedback recipient. Because employees devote their energy to reshaping their network, and ignore the potential developmental opportunities of the disconfirming feedback, their performance suffers.

Finally, we provide the first (to our knowledge) empirical examination of the relationship between feedback and organizational social networks. Drawing on psychological research on positive self-concept maintenance, we argue that employees may react to disconfirming feedback by cutting ties with feedback providers, thus reshaping their social networks over time. This insight shines light on an important and unexplored domain in social network research. Historically, social network research has examined an actor’s network position as a determinant of important outcomes—that is, as an independent variable. Relatively less research has examined the predictors of network position (Borgatti & Foster, 2003). Our research provides insight into a mechanism that can lead to shifts in network position. Our findings suggest that network positions generally thought to be advantageous might, in fact, be disadvantageous—that the path through which an individual comes to acquire a network position influences the degree to which that position can be experienced as advantageous.

**NEGATIVE FEEDBACK AS A THREAT TO ONE’S SELF-CONCEPT**

 Feedback is generally characterized as a process of informing and enabling personal improvement and development. The developmental feedback literature arose, in large part, from the realization that employee self-assessments of performance tend to be unrealistically upwardly biased and not particularly useful for developmental purposes. Meyer (1980) described a number of studies finding that employees routinely rate themselves highly relative to their colleagues and above average for their organization. In one exemplar study, the average self-appraisal was the 78th percentile, with only two out of 92 total participants assessing themselves as below the 50th percentile (Kay, Meyer, & French, 1965). As these results indicate, we humans maintain unrealistically positive self-views (Greenwald, 1980; Taylor & Brown, 1988).

 The desire to maintain a positive self-concept is such a fundamental human motivation that we engage in a variety of behaviors to protect such an image of ourselves. For instance, we think of ourselves as generally above average (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Kruger & Dunning, 1999), consistently report that we have more positive characteristics than negative ones (Dunning, Meyerowitz, & Holzberg, 1989), and view ourselves more positively than do others (Lewinsohn, Mischel, Chaplin, & Barton, 1980).

Given the human fundamental desire to maintain a positive self-concept, we may not be particularly open to feedback when it is negative and inconsistent with our self-assessments.

Performance evaluation and developmental feedback processes are designed to help us view our potential weaknesses and deficiencies accurately (Buckingham & Clifton, 2001). Feedback from others is not subject to the self-deceptive tendencies so apparent in the self-evaluation process. It is more likely to be honest and thus can provide insights that enable recipients to overcome ego-driven self-enhancement. But although peer feedback can hold a mirror up to employees, identifying areas in need of development, this exposure may not lead to meaningful efforts to improve, even when the feedback is valuable.

 Various empirical studies have found that employees’ actual responses to negative feedback are complex (e.g. Greenberg, 1977; see Kluger & DeNisi, 1996 for a review). One meta-analysis found that one-third of feedback interventions actually resulted in *lower* post-feedback performance (Kluger & DeNisi, 1996). Other studies show that employees’ self-assessment remains unchanged even in the face of disconfirming feedback (Johnson & Ferstl, 1999; Kay et al., 1965; Meyer, 1980), in part because negative feedback can damage recipients’ self-esteem (Ilgen & Davis, 2000; Kay et al., 1965).

 Building on this work, we suggest that feedback that is inconsistent with one’s self-views of performance in a specific domain will be perceived as threatening. We use the label *disconfirming feedback* to refer to feedback that is more negative than an individual’s self-assessment in a particular domain (e.g., leadership skills, creativity, etc.). We focus on developmental feedbackdelivered along normative dimensions—dimensions along which there is a ubiquitous preference for more positive ratings. We refer to peer feedback that is equal to or more favorable than one’s self-assessment as *confirmatory*, as it is seen as confirming (and perhaps even enhancing) one’s positive views of the self. We thus predict:

*Hypothesis 1: People are likely to perceive disconfirming feedback as more threatening to their self-concepts than feedback that is not disconfirming.*

**Threat to One’s Self-Concept and Shaping of the Social Environment**

As social psychology research suggests, when we encounter threatening information about ourselves, we engage in self-protective processes, ignoring, minimizing, or reconstructing the information to the extent possible (Alicke & Sedikides, 2009; Sedikides & Alicke, 2012). For example, we soften negative information about ourselves by drawing positive comparisons to individuals who are worse on a given dimension (Wills, 1981) or by derogating others (Fein & Spencer, 1997). Other self-protective strategies include externalizing the causal attributions we make about our failures, such as finding flaws in a test that we fail (Wyer & Frey, 1983) or crediting an evaluator’s negative feedback to that person’s racism or sexism (Crocker, Voelkl, Testa, & Major, 1991). These self-protective strategies ultimately serve the same fundamental human motivation of maintaining a positive self-view.

We suggest that individuals can also engage in behaviors that allow them to protect their self-concept when it is threatened by relating differently to those who were the source of the threat. In the context of identity threats at work, Petriglieri (2011, p. 648) suggests that individuals might “disengage from any role or group associated with the threat” in an evasive effort. Similarly, we suggest, when people’s self-concept is threatened, they will endeavor to shape their context to minimize or eliminate the threat. The threat to the self-concept posed by disconfirming feedback is social in nature. Not only will employees likely attempt to discredit those who provide disconfirming feedback and discount the feedback itself, but to protect their self-concept, employees will look for opportunities to reshape their network of work relationships in ways that they believe will be less threatening. In the face of a threat to their self-concept, they will be motivated to shape their social environment to eliminate or otherwise dilute the psychological costs associated with disconfirming feedback. We propose that they will do so by strategically eliminating and/or adding professional relationships in an attempt to eliminate (or minimize the risk of) negative feedback and to ensure more favorable feedback in the future.

We expect the nature of the strategic reshaping of one’s social environment to be contingent on the nature of the recipient’s relationship with the feedback giver. In many organizations, employees have some discretion over what they work on and with whom they work, but certain aspects of their role will obligate them to maintain relationships with specific individuals. We argue that employees will shape their social environment differently in response to disconfirming feedback from the former (a discretionary relationship) than they will to disconfirming feedback from the latter (an obligatory relationship). Specifically, when employees receive disconfirming feedback from a colleague with whom they are not obliged to maintain a relationship, they will be motivated to eliminate that relationship to avoid the risk of threatening disconfirming feedback from that person in the future. We predict:

*Hypothesis 2: People are more likely to eliminate a discretionary relationship with a person providing disconfirming feedback than they are to eliminate a discretionary relationship with a person providing feedback that is not disconfirming.*

*Hypothesis 3: Perceived threat to one’s self-concept explains how disconfirming feedback leads to the elimination of a discretionary relationship.*

 Of course, many relationships within organizations are not discretionary. Further, many peer review processes are anonymous; it might be difficult to distinguish who precisely provided the disconfirming feedback, leaving the recipient without the option of severing the relationship. We consider these relationships as obligatory and expect that employees will respond differently when receiving feedback from obligatory colleagues than when receiving feedback from discretionary colleagues. While we expect dropping a discretionary relationship to be sufficient to eliminate a threat to the self-concept, if an employee cannot simply drop a relationship in response to disconfirming feedback, we propose that she will seek new relationships elsewhere within the organization, specifically with colleagues from other areas who will be less likely to be influenced by the extant opinions of current colleagues. More importantly, the greater the number of obligatory relationships (colleagues in the recipient’s core group of relationships) provide disconfirming feedback, the further away we would expect the recipient to look for these new relationships. This prediction is grounded in the logic that, if an employee cannot eliminate a disconfirming connection due to its obligatory nature, he will attempt to attenuate the psychological effects of that disconfirming evidence in subsequent years by shopping for new relationships that will (presumably) provide more favorable reviews of the focal employee.

This logic aligns closely with the idea of constraint conceptualized by Burt (2009) in his seminal work on structural holes. Networks (or subsets of networks) can be described, in part, by the degree to which people are connected to others who are also connected to the same others. For example, consider a network with five actors. There are a total of 10 possible connections in this network—the number of connections that would arise if each actor is connected to each other actor in this network. Burt proposed that, while some positive aspects associated with such a network do exist, there are also individual downsides. If an actor is connected to all other actors in a network, all of which are also connected to each other, the focal actor is relatively constrained by being so tightly enmeshed in a cohesive group of fellow actors (Burt, 2009). Conversely, if an actor is connected to all other actors, who are otherwise disconnected, he is relatively unconstrained, and has an advantageous network position (given that he is a path through which other actors must traverse in order to reach other connections in the network). Burt developed an index to measure the degree to which an individual is constrained, ranging from 0 (unconstrained, in which the focal actor is connected to all others in the network, who are otherwise not connected to each other), to 1 (constrained, in which all actors in the network are connected to all other actors). When employees receive disconfirming feedback from obligatory relationships, employees will seek out new relationships with employees outside of their tight-knit circle of colleagues who are the source of the troubling disconfirming reviews. The greater the number of obligatory peers provide disconfirming feedback, the further away (and more relatively disconnected from the recipient’s core group of connections) the new connection will be—leading to relatively lower constraint. Thus, we predict that:

*Hypothesis 4: The greater the number of a person’s obligatory reviews are disconfirming, the greater the negative change in constraint in the future.*

**Shopping for Confirmation and Performance**

 A healthy self-concept is critical to the maintenance of general psychological well-being and avoidance of depression and negative affectivity (Ruehlman, West, & Pasahow, 1985; Taylor & Brown, 1988). The indirect organizational effects associated with perceived threats to an employee’s self-concept are multitude—ranging from disengagement to turnover to decreased motivation (Davies, Spencer, & Steele, 2005; Elsbach, 2003; Nag, Corley, & Gioia, 2007). However, this leads us to the tension that prompted feedback interventions in the first place: we are willfully blind to our deficiencies, and improvement demands some sort of outside intervention to make visible the areas needing improvement. An individual who indulges the drive to reshape her network of work relationships as a means of avoiding a threat to her self-concept might consequently be able to maintain her motivation and sense of engagement, but will likely remain blind to her deficiencies and, in turn, fail to pursue opportunities for improvement. In addition, by eliminating discretionary relationships, one may fail to receive the support and advice that is key to one’s career and development. Work performance depends, to some degree, on obtaining the information needed to solve challenging problems as well as advice from others, who can provide different perspectives on the task and appropriate support along the way (Cummings & Cross, 2003; Mehra, Kilduff, & Brass, 2001). The network of colleagues who provide developmental feedback also are a source of a multitude of valuable resources—enabling the transfer of institutional knowledge, critically valuable advice and problem-solving assistance (Baldwin, Bedell, & Johnson, 1997; Brass, 1981; Cross & Cummings, 2004; Gino, 2008; Reagans & McEvily, 2003; Sparrowe, Liden, Wayne, & Kraimer, 2001; Yaniv & Kleinberger, 2000). Dropping relationships in response to disconfirming feedback robs the recipient of potentially valuable sources of advice, assistance, and overall support. Even seeking distant relationships as a response to disconfirming feedback from obligatory relationships is likely also a reflection of the recipient’s motivation to distance herself from the disconfirming feedback giver. Even though the recipient cannot completely disengage from the feedback giver, the relationship will suffer from decreased trust (at least on the part of the feedback recipient), and, consequently, decreased likelihood of seeking assistance, advice, or support from the disconfirming colleague.

Thus, though self-protective tendencies in response to disconfirming feedback are likely to have positive psychological effects, they will influence performance negatively. Individuals must find ways to internalize disconfirming feedback in order to improve—an unlikely outcome if their tendency is to seek to reshape their network in response to such feedback, as we hypothesized. Conversely, those who can find ways to internalize the feedback and avoid its psychological consequences, without dropping relationships or seeking new, more confirming relationships, will be more likely to benefit from relationships with colleagues, allowing the recipient to avoid the detrimental performance effects associated with dropping relationships. We propose that individuals who engage in these behaviors will perform at lower levels relative to individuals who do not. Thus, we hypothesize:

*Hypothesis 5a: Eliminating discretionary relationships with individuals who provided disconfirming feedback is negatively associated with subsequent performance.*

*Hypothesis 5b: Decreases in constraint in response to disconfirming feedback by obligatory relationships is negatively associated with subsequent performance.*

**Overview of the Present Research**

 Figure 1 depicts our theoretical model. To test our hypotheses, we use both field data (Study 1) and laboratory studies (Studies 2 and 3). In Study 1, we use multiple years of data from a peer feedback process, combined with a unique longitudinal social network dataset from the same organization, to test Hypotheses 2, 4, 5a, and 5b. We find that employees, in the face of disconfirming peer feedback, reshape their social networks in ways designed to eliminate or attenuate the threat brought about by the feedback, and that this behavior is detrimental to employee performance. In Studies 2 and 3, we provide a conceptual replication of these findings and show that this reshaping of social networks occurs because negative feedback is perceived as threatening to one’s self-concept, thus providing evidence consistent with Hypotheses 1 and 3.

----------------------------------------------------

Insert Figure 1 about here

----------------------------------------------------

**STUDY 1: FIELD STUDY**

**Sample and Data**

To examine Hypotheses 2, 4, and 5, we use archival data collected over a period of four years from a vertically integrated food manufacturing and agribusiness company located in the Western United States. The firm has been in business for nearly 30 years and encompasses a wide-range of interrelated functions, including farming, harvesting, trucking, processing and distribution. Over the period covered by our sample, the organization employed between 260–290 full-time employees at any given time (although, with attrition, hiring, and other staffing fluctuations, there are a total of 347 unique employees represented in our data).

The company operates under a fluid structure; employees have some discretion over the scope, responsibilities, and deliverables of their role. As part of this process, employees enter into agreements with other employees to ensure the coordination of effort, transfer of information, and successful flow of work through the organization. Individuals identify specific tasks or projects in which they wish to be involved and identify relationships with other employees who depend on or are involved in these projects or tasks. Some of these relationships are obligatory (e.g., two employees share a job function or are in the same functional area), while some are discretionary, and reflect projects and particular initiatives that an employee chooses to undertake. These colleague relationships form a social network of sorts, which we leverage in the testing of our hypotheses. Employees also are responsible for providing feedback to all of their identified colleagues, as the organization relies heavily on peer regulation and proactive self-development. This peer feedback process is the sole structural method of providing employees with developmental insight within this organization, as it has no managerial review processes.

**Peer-Review Data**

 Each December, the entire company engages in a planning process. Employee’s report on their individual performance, complete a self-evaluation, and provide structured reviews of each of their identified colleagues from the past year. Each employee is blind to others’ reviews of them until after the review period closes. The self and peer-evaluations are identical and are completed using a proprietary software that includes Likert-type scales across seven organizationally important distinct categories,(such as “Improvement Orientation” and “Leadership & Initiative”). The individual items in each category were crafted and refined by the organization over a number of years.[[1]](#footnote-1) They include items such as “[employee] proposes and causes changes in the way things are done in order to improve” in the “Improvement Orientation” category and “[employee] takes unpopular stands when necessary and advocates for what they believe is right” in the “Leadership & Initiative” category. All items are rated using a 7-point Likert scale ranging from “Very Poor” to “Excellent” (as well as “Not capable of judging”). Each category includes optional open-form text response fields, and though comments are not required, employees are encouraged to provide both constructive and positive comments.

At the end of the review period, each employee receives a report that includes a summary of their self-assessment on each item (completed prior to seeing the reviews provided by their colleagues), each received review (not anonymized), and an averaged summary of all of the employee’s received reviews. The first page of the report provides the individual’s overall average self-rating (calculated as the total average of all Likert-type items, collapsed into a single average), alongside the overall average received peer rating (on those same items) by each peer colleague. Because this overall aggregated average score on the Likert-rated items—for the self-evaluation and for each received peer evaluation—are the primary data presented on the first page of each employee’s report, we use these same aggregated average scores in our analyses.

----------------------------------------------------

Insert Figure 2 and Table 1 about here

----------------------------------------------------

Our dataset includes all self-evaluations and peer evaluations conducted in the years 2012, 2013, and 2014. The average number of reviews received by year is shown in Figure 2, and correlations of all variables used in our analyses are shown in Table 1.

**Employee Relationship Network Data**

Each January, employees identify those colleagues with whom they will be working in the coming year using a proprietary software. Identification of these relationships is a participative form of crafting the employee’s role within the organization—by defining activities that the employee is committing to in the coming year, and identifying those with whom the employee has a substantive working relationship. These working relationships might take the form of shared responsibilities (two colleagues are co-committed to a specific activity) or interdependencies (one employee depends on the other to provide some product or service). Employees have some discretion over the structure of their role as well as the nature of their relationships within the organization. Some colleague relationships are discretionary (formed based on some mutual agreement to work together on some activity); others are obligatory, in that the physical process demands the two employees maintain a functional relationship (there are many interdependencies within the process, and committing to a specific activity may necessitate a relationship with a particular colleague). For example, if two employees are in the same work unit at a facility or location, it would be very difficult, given the structural interdependency that exists between the two, for them not to maintain a colleague relationship.

Our dataset includes identified relationships for the entire company over four years: 2012, 2013, 2014, and 2015. The number of employees represented and the total number of identified relationships are shown by year in Figure 2. These datasets together provide review data collected over three consecutive years and employee relationship network data collected shortly thereafter (the subsequent January) for the following three years, as shown in Figure 2. This allows us to observe the ways in which the peer-evaluation process influences employees’ social networks by observing changes in social networks in the period immediately following the review process.

**Empirical Strategy**

***Disconfirming feedback and discretionary relationships***. Hypothesis 2 predicted that employees would be more likely to drop relationships when, in the prior review period, they received disconfirming feedback from a colleague with whom they previously had a discretionary relationship than when they received feedback that was not disconfirming from a discretionary colleague. We employ a logistic regression to test Hypothesis 2, which predicts the likelihood of an employee dropping (eliminating a previously existing relationship) in year *y*, using the following model:



Where *Dropped* is a dummy variable, coded as 1 if, in year *y*, employee *i* eliminated a relationship that previously existed with peer *p* and is zero, otherwise; and where *DegreeDisconfirm* is a calculated continuous variable, coded as 0 if, in year *y*, peer *p* provided a rating of employee *i* that was greater than or equal to employee *i*’s self-rating, and calculated as the self-rating value less the peer-rating value if the peer review was disconfirming.

We include four controls in the model: *SameUnit* is a dummy indicator that takes the value of 1 if both the focal employee *i* and the reviewing peer *p* are in the same work unit; *SameLocation* is a dummy variable that takes the value of 1 if both the focal employee *i* and the reviewing peer *p* work at the same location. These two variables together serve as a conservative proxy for obligatory relationships, as employees working in the same unit and at the same location are generally expected to maintain work relationships with each other. *Totalreviews* is a control for the total number of peer reviews received by employee *i* in year *y-1*, as a single disconfirming review likely will have a greater psychological impact for employees with only a few colleague relationships than for employees with a great number of colleague relationships. And *SelfRating* controls for the focal employee’s self-review score in year *y-1*.

Our Hypothesis 2 predicted that the more disconfirming a received peer review is, the greater the likelihood that that peer relationship is dropped in the following network period if that relationship is discretionary. This would lead us to expect that the odds ratio for *DegreeDisconfirm* will be greater than 1.

***Disconfirming feedback and obligatory relationships***. Hypothesis 4 predicted that the greater the number of an employee’s reviews from obligatory relationships were disconfirming, the lower the employee’s measured constraint in the subsequent network period. We test Hypothesis 4 using an ordinary least squares (OLS) specification, estimating the predicted change in constraint for an employee from review year *y* to the subsequent network year, *y + 1*, using the following model:



Where *ChangeConst* is the change in constraint from the review year, *y*, to the following network year, *y + 1*, for individual *i,* and where *CountNonDiscretionary* is the count of non-discretionary (obligatory) relationships providing a disconfirming review to employee *i* in year *y*. We identified a relationship as non-discretionary if the fellow employee was in the same business unit at the same location as the focal employee. This is a conservative proxy for obligatory relationships in that, based on organizational rules, employees who work in the same area (or business unit, in this firm’s lexicon) at the same location are required to work together.

In all models, we control for *TotalDisconfirm,* the number of disconfirming reviews (total number of colleagues who provide a rating below the employee’s self-rating) in year *y*. Our primary specification includes additional controls. *SelfRating* controls for the focal employee, *i*’s, self-review in year *y*. And *Totalreviews* is a count of the total number of reviews received by employee *i* in year *y*. Models are estimated with robust standard errors clustered by employee.

 Our Hypothesis 4 predicted that, controlling for the total number of disconfirming reviews received by an employee, the greater the number of an employee’s non-discretionary colleagues providing a disconfirming review, the more likely that employee would be able to seek new relationships outside of her current network in future years, leading to reduced constraint. Thus, we expect that the coefficient on *CountNonDiscretionary* will be less than 0.

**Results**

**Testing Hypothesis 2*.***As Hypothesis 2 predicts, we find a strong positive relationship between feedback that is disconfirming and the likelihood that the individual receiving the negative feedback drops the relationship in the subsequent year. The results are shown in Model 2 in Table 2 (Model 1 in Table 2 includes all controls without the independent variable included in the specification). The odds ratio of 1.440 on *DegreeDisconfirm* suggests that, controlling for whether the reviewer is in the same unit and at the same location as the recipient of the review, a reviewer who provides disconfirming feedback is more likely to be eliminated from the recipient’s network in the following year than is a reviewer who provides confirming feedback. To provide some context, this finding suggests that a 1.00 point lower average peer review, as compared to one’s self-review, yields a 44% increase in the odds of an employee dropping a relationship with a reviewer. This result is statistically significant (*p* = 0.000) and is robust to the inclusion or exclusion of all controls, individually or simultaneously.

 To test the robustness of our results, we tested two alternate operationalizations of our independent variable. We first test a binary indicator for disconfirming (1 = disconforming review; 0 = not disconfirming) in Model 3 in Table 2. We also test a fully continuous version of the independent variable, including the degree to which confirming reviews are relatively more positive than the self-assessment (rather than coding all confirming reviews as 0s). Our main result holds, such that a disconfirming review is, in all cases, is more likely to lead to a severed relationship in the subsequent year.

----------------------------------------------------

Insert Table 2 about here

----------------------------------------------------

**Testing Hypothesis 4*.***We predicted, with Hypothesis 4, that the greater the number of an employee’s non-discretionary reviews are disconfirming, the lower that employee’s constraint in subsequent periods. Table 3 shows the results of our analysis of this hypothesis. Model 1 shows all controls regressed on our dependent variable of *ChangeConstraint*, excluding the independent variable. The results shown in Model 2 in Table 3 provide support for our Hypothesis 4. As predicted, the coefficient on *CountNonDiscretionary*, -0.0161, is negative and statistically significant (*p* = 0.011), suggesting that controlling for the total number of disconfirming reviews, each additional non-discretionary disconfirming review is predicted to reduce the employee’s constraint score by 0.0161 in the subsequent year. When employees receive disconfirming feedback from peers within their work unit—relationships that they can’t eliminate by virtue of structural aspects of the work—they may respond by seeking relationships with colleagues from outside their core network. To put this in perspective, the average constraint score in 2012 was .2866, suggesting that the average employee’s constraint would drop by about 5.6% in response to a single disconfirming review by an obligatory colleague.

----------------------------------------------------

Insert Table 3 about here

----------------------------------------------------

**Testing Hypotheses 5a and 5b.** We predicted that engaging in these behaviors—either dropping discretionary relationships with those who provided disconfirming feedback (Hypothesis 5a) or seeking new relationships with those who are otherwise relatively disconnected from one’s current network, leading to decreased constraint (Hypothesis 5b)—would lead to lower performance. The organization employs a performance-based process for awarding bonuses annually, using individual performance on job-specific objective measures of performance as a guide for providing bonuses, so the best proxy for individual performance is the employee’s received bonus. The organization provided data for bonuses awarded at the end of 2015. Each record in the dataset is comprised of the employee ID and a percentage bonus, calculated as the percentage of salary awarded as a performance bonus.

Because the organization only provided one year of performance data (bonuses at the end of 2015), our performance analyses are restricted to the period from the end of 2014 through the end of 2015. Our general performance hypothesis is that employees who, upon receiving disconfirming reviews, engage in these counterproductive behaviors as they begin their next year’s work, will perform more poorly over that following year and thus receive lesser year-end bonuses. Our analyses use self-evaluation and peer-evaluation data from the end of 2014, network data from 2015, and bonus allocations from the end of 2015. Figure 3 provides a timeline depicting the point at which each portion of data used in these analyses were generated.

----------------------------------------------------

Insert Figure 3 about here

----------------------------------------------------

Our first performance hypothesis (H5a) relates to the dropping of discretionary disconfirming relationships. We estimate the effect of a dropped disconfirming relationship on subsequent year bonus percentage using OLS to estimate the following model:

Where *BonusLogi,2015*is the log-converted bonus amount from the end of 2015 (log-converted because of a severe positive skew in the bonus percentages). There were no negative bonus amounts in the raw data, and we added 1.00 to all raw bonus percentages prior to log-transformation to correct for zero bonus values. Our independent variable of interest is *DroppedDiscrevi,2014*, calculated as the total number of discretionary relationships that were dropped by employee *i*, following a disconfirming *2014* review. We include four controls: *TotalDisconfirm* is the total number of disconfirming reviews received by employee *i* in the *2014* review period. And, although the ratings generated by the review process have no structural formulaic relationship with bonus received, there may be a relationship between the average review received at the end of 2014 or 2015 and the 2015 bonus received. Consequently, we also control for *AvgRating*, the average peer rating received by employee *i* at the end of *2015,* and at the end of *2014*, as well as the recipient’s gender, to control for any gender effects associated with compensation. Finally, our specification includes business-unit fixed effects (*BusUnitID*) as units have varying norms around bonus percentages, and average bonus varies as a function of business unit. Standard errors are clustered at the business-unit level.

 Hypothesis 5a suggests that the greater the extent to which individuals engage in the practice of dropping discretionary relationships that provide disconfirming reviews, the lower their performance will be in the subsequent year. We would expect, then, that the coefficient on *DroppedDiscrev* would be negative. Model 1 in Table 4 shows the results of our analysis of H5a. Although the estimated coefficient on *DroppedDiscrevi,2014* of-0.0019 is, in fact, negative (suggesting that each negative review leading to a dropped relationship has a negative impact on the subsequent year’s log-bonus percentage), the calculated p-value (*p* = 0.802) is not statistically significant. Our data do not support Hypothesis 5a.

----------------------------------------------------

Insert Table 4 about here

----------------------------------------------------

Our second performance hypothesis (H5b) relates to the change in constraint we observe when employees receive disconfirming reviews from obligatory colleague relationships. Our analysis of Hypothesis 4 (H4) supports our assertion that individuals will, in response to disconfirming reviews from obligatory peers, seek connections with others who are relatively disconnected from their current circle of relationships, leading to a decrease in calculated constraint in the subsequent year. Our analysis of the performance effects associated with this behavior exploits the variance we observe in it. Specifically, some employees (whom we dub “shoppers”) seek new, relatively unconnected relationships when receiving disconfirming feedback from their obligatory relationships. Others (whom we call “improvers”) demonstrate restraint, refraining from seeking these new, relatively unconnected relationships in spite of the disconfirming feedback from their obligatory relationships. We can create a “shopper”/ ”improver” index by calculating the residuals from our H4 regression estimate. Recall that our estimate of H4 predicted the change in constraint of an employee in year *y* based on the number of disconfirming reviews received by obligatory colleagues in year *y-1*. Further, the predicted change in constraint for a shopper is negative (that is, we expect those who indulge in this shopping for confirmation behavior to have lower constraint in the subsequent year). Thus, we would expect shoppers (those who over-indulge in this shopping behavior) to have relatively positive residuals and improvers to have relatively negative residuals.

To exhibit these relationships, consider the following hypothetical conceptual example. Employee A (an “improver”) received three disconfirming reviews from obligatory colleagues in 2014. Suppose our regression model from H4 predicted a change in constraint, given three disconfirming reviews, of -.20 (it does not; we simply use these numbers for ease of illustration). If, in reality, Employee A’s observed change in constraint was 0, our residual would be:

ResidualA = Observed – Calculated = 0.00 – (-.20) = .20

Employee B also received three disconfirming reviews from obligatory colleagues in 2014. Again, our regression model from H4 would predict a change in constraint of -.20. This employee (a “shopper”) over-indulged in confirmation shopping, and in the following year, the employee’s constraint changed by -.30. In this case, our residual for H4 would be:

ResidualB = Observed – Calculated = -.30 – (-.20) = -.10

 In general, the greater the degree to which an employee is a “shopper,” leading to greater negative changes in constraint, the more extremely negative the employee’s residual from our estimate of H4; and the greater the degree to which an employee is an “improver,” leading to less negative changes in constraint, the less extremely negative (more extremely positive) the employee’s residual from our estimate of H4. Using this distribution of residuals, and on the logic that individuals engage in this behavior to varying degrees, we can estimate the degree to which engaging in, or restraining from, confirmation shopping influences an individual’s performance over the course of the succeeding year.

 We estimate the effect of an employee’s calculated residual from our estimate of H4 on the employee’s following year performance, using OLS to estimate the following model:

Where *BonusLog* is the log-transformed bonus percentage earned by employee *i* at the end of the year *2015*, and where *H4residual* is the calculated residual value after estimating our primary model from our estimation of H4 above, for employee *i* at the end of *2014*. Because we employ the residuals from the regression predicting change in constraint from 2013 to 2014, we only included employees who were employed at the end of 2013 and participated in both the 2013 and 2014 review processes (thus having a constraint score for both 2013 and 2014 and, in turn, a residual from the end of 2014), and who were still employed at the end of 2015. We control for *TotalDisconfirm*, calculated as the total number of disconfirming reviews received by employee *i* at the end of 2014; *TotalObligatoryDisconfirm*, calculated as the total number of obligatory disconfirming reviews received by employee *i* at the end of 2014; as well as *AvgRating2014*, *AvgRating2015*, and *Gender* (all coded consistent with our analysis of H5a). Again, our specification includes business-unit fixed effects (*BusUnitID*), and standard errors are clustered at the business-unit level.

 Our primary specification, shown in Model 3 in Table 4, supports our Hypothesis 5B. The calculated coefficient of 0.03368 is directionally as we would expect (a more positive residual, expected for an “improver,” yields a higher log-bonus; a more negative residual, expected for a “shopper,” yields a lower log-bonus), and is statistically significant (*p* = 0.003).

**Study 1 Discussion**

The results of Study 1 provide support for Hypothesis 2 and suggest that disconfirming reviews lead employees to drop relationships with the reviewing colleague if the relationship is discretionary. The results also support Hypothesis 4: employees reform their network, likely in search of a more hospitable relational clime, by seeking new colleagues relatively more disconnected from their current circle of colleagues for each obligatory relationship providing a disconfirming review. Finally, we found partial support for our hypothesis that confirmation shopping leads to decreases in performance in the succeeding year. Our Hypothesis 5a was directionally as expected but not statistically significant. Our second performance hypothesis, H5b, was strongly supported, and suggests that those who indulge in seeking confirmation by finding relationships with those who are relatively unconnected from the focal employee’s existing social network do in fact perform poorly in the subsequent year, relative to those who refrain from this confirmation-seeking behavior.

These findings provide some evidence that the network-shaping behavior that employees display in response to negative feedback, while potentially salvaging their self-concept, is detrimental to their long-term performance. Importantly, our performance measure is observed a full year after the employees received the disconfirming feedback and altered their network. A year is time enough for any negative psychological effects of feedback to have been forgotten and for the receiving employee to have moderated their behavior and improved their performance. The fact that we find such a performance effect, even a year after the disconfirming feedback, suggests some more lasting mechanism contributing to this decreased performance. In studies 2 and 3 we provide a conceptual replication of our field study, validate the psychological mechanism leading to these behaviors, and also provide some evidence that the decrease in performance resulting from confirmation shopping is social in nature.

# STUDY 2: DISCONFIRMING FEEDBACK IS THREATENING

In Study 2, we investigated the psychological mechanism explaining why disconfirming feedback leads to the reshaping of one’s social network by focusing on the role of perceived threat to one’s own self-concept (Hypotheses 1, 2, and 3). We recruited 305 undergraduate and graduate students (45.6 percent male; mean age = 25.08, s.d. = 4.67) from a private university in the Northeastern United States to participate in this study in exchange for $10 and the opportunity to earn an additional $5 bonus. Study 2 employed two between-subjects conditions: disconfirming vs. confirming feedback.

## Procedure

The study was conducted online. The instructions informed participants that the researchers were interested in studying how people work with others and perform on creativity and problem-solving tasks. After answering questions about their gender and age, participants were told that, during the study, they would be paired with another participant and asked to work on a series of short tasks. After a short wait, during which the pairing was seemingly occurring, participants learned that they would complete a creativity task with their partner. As the instructions explained, they would be randomly assigned to the role of either writer or evaluator in this task: “The writer will be asked to write a creative short story that is at least 200 words. The evaluator will be asked to evaluate it for creativity. You and the participant you have been paired with will now be randomly assigned to one of these two roles.” In reality, the other participant was a computerized script, and all study participants were assigned to the role of writers. To increase realism, the assignment to a partner and a task took some time to occur.

Participants next were given five minutes to write a story. Participants were told that the evaluator would be asked to evaluate the story for creativity. After writing their story, participants were asked to assess their own level of creativity based on what they had written (from 1=not creative at all to 10-very creative).

Next, participants were randomly assigned to one of two conditions: disconfirming vs. confirming feedback. In the confirming-feedback condition, they received a feedback score that was two points higher than their own self-assessment; in the disconfirming-feedback condition, they received a feedback score two points lower on creativity than their own self-assessment.

Participants then answered a series of questions assessing how much they found the feedback to be threatening. We measured perceived threat using four items (α= .85). Participants indicated the extent to which they found the evaluator’s assessment to be: (1) threatening, (2) challenging, (3) disappointing, and (4) threatening to their sense of competence, each on a 7-point scale (from 1=not at all, to 7=very much).

Participants then moved to the next task: a trivia quiz. The instructions read:

*In this task, you and another participant will be asked to answer a series of 10 questions under time pressure. If you both answer all questions correctly you will receive a bonus.*

*For this task, you can decide to continue working with the same participant you have been paired with or choose to be paired with a different one.*

Prior to completing the trivia task, participants chose whether to complete the task with the same participant they had been assigned to at the beginning of the study or with another participant. This choice served as our main dependent variable. The instructions informed them that they and their partner would each respond to a set of 10 trivia questions and that if they both answered all the questions correctly, they would earn a $5 bonus. After completing the trivia task, participants were debriefed. Each participant received $15 for participating.

## Results

Perceived threat. Consistent with Hypothesis 1, participants who received disconfirming feedback perceived the feedback to be more threatening (mean = 2.99, s.d. = 1.57) than did those who received confirming feedback (mean = 1.82, s.d. = 1.18), t(302) = 7.37, p < .001, d = .84.

Choice of partner for the trivia task. A higher percentage of participants who received disconfirming feedback (27.8%, 42 out of 151) chose to be paired with a new partner for the trivia task as compared to those who received confirming feedback (7.2%, 11 out of 153), χ2(1, N=304) = 22.46, p < .001, Cramer’s V = .27. These results are consistent with Hypothesis 2.

Performance on the trivia task. Given that the choice of partner did not affect work on the trivia task, we did not expect to find differences on performance. In fact, participants’ score on the trivia task did not differ depending on whether they received disconfirming feedback (mean = 4.21, s.d. = 2.09) or confirming feedback (mean = 4.49, s.d. = 2.39), t(300) = -1.07, p = .29, d = .12.

Mediation analyses. Our third hypothesis predicted that perceived threat would explain why a disconfirming review of the focal person leads to the elimination of a discretionary relationship. We tested whether perceived threat mediated the relationship between our feedback conditions and the choice of partner for the trivia task, using the bootstrapping approach outlined by Preacher and Hayes (2004). Based on bootstrapping (with 10,000 iterations), we estimated the direct and indirect effects of the feedback condition via perceived threat on our dependent variable: the choice to be paired with a new partner. Our manipulation had a significant effect on perceived threat (as shown by the analyses above), which, in turn, significantly affected the choice to be paired with a new partner (*B* = .28, S.E.= .10, *p* = .007). In contrast, the effect of our manipulation was reduced (from *B* = -1.60, S.E.= .36, *p* < .001 to *B* = -1.29, S.E.= .38, *p* = .001) when perceived threat was included in the equation. The 95 percent bias-corrected confidence interval for the size of the indirect effect excluded zero (.078, .631), suggesting that perceived threat mediated the link between the feedback condition and greater likelihood of choosing a different partner.

**Discussion**

Together, these results provide support for Hypotheses 1, 2, and 3. We find that disconfirming feedback makes people less likely to interact with those who gave the feedback because they perceive it to be a threat to their self-concept.

# STUDY 3: WHETHER SELF-ASSESSMENT BEFORE DISCONFIRMING FEEDBACK MATTERS

So far, we have demonstrated that disconfirming feedback is perceived as a greater threat to one’s self-concept than confirming feedback and that this difference influences the likelihood of further interaction with the feedback giver. In both a field and laboratory study, people received disconfirming feedback after having the opportunity to self-assess. In Study 3, we examine whether self-assessment is a necessary condition for disconfirming feedback to produce the effects we demonstrated in Studies 1 and 2. Even if people don’t self-assess explicitly before receiving feedback from others, it is likely they still will have an urge to evaluate their work. Thus, feedback received from others may still be perceived as either consistent or inconsistent with one’s own implicit self-assessment. We test for this possibility in Study 3.

In addition, in Study 3 we further test Hypotheses 5A and 5B regarding the effects of disconfirming feedback on performance. We use a paradigm in which participants can receive objectively good advice on a problem-solving task (before engaging in it) from people who gave them either disconfirming or confirming feedback. This allows us to test whether deciding not to take advice (a proxy for dropping a discretionary relationship in a work context) explains why disconfirming feedback leads to poor performance.

We recruited 595 people (45.9 percent male; mean age = 32.68, s.d. = 8.91) from Amazon’s Mechanical Turk to participate in this study in exchange for $2 and the opportunity to earn an additional $10 bonus. Study 3 employed a 2 (type of feedback: confirming vs. disconfirming) by 2 (self-assessment: explicit vs. implicit) between-subjects design.

## Procedure

The study was conducted online. We randomly assigned participants to one of the four conditions.[[2]](#footnote-2) As in Study 2, the instructions informed them that the researchers were interested in studying how people work with others and perform on creativity and problem-solving tasks. After being welcomed to the study, participants answered questions about their gender and age. They were then told that, during the study, they would be paired with another participant and asked to work on a series of short tasks. For the pairing and the creativity task, we used the same procedure and instructions as in Study 2.

After completing the creativity task, participants in the explicit self-assessment conditions were asked to assess their own level of creativity based on the story they wrote (from 1=not creative at all to 10=very creative). Participants in the implicit self-assessment conditions were not asked to provide an assessment of their own level of creativity.

Next, participants in each of these two conditions were randomly assigned to receive either confirming or disconfirming feedback. To assure there would be a parallel in the feedback participants received in the explicit and implicit self-assessment condition, we gave participants in the disconfirming [confirming] feedback condition the following feedback: “Based on the essay you have written, I have rated your creativity as 2 [8].” Thus, the study was set up such that the confirming feedback was always 8 (unless a participant in the explicit self-assessment conditions provided a self-rating equal to or greater than 8, in which case the feedback was 10). As for the disconfirming feedback, it was set up to be always 2 (unless a participant in the explicit self-assessment conditions provided a self-rating equal to or lower than 2, in which case the feedback was 0).

Participants then answered a series of questions assessing the degree to which they found the feedback to be threatening (using the same four items as in Study 2; α= .88) and then moved on to a second task—a brain teaser. In the brain teaser they saw 10 different grids, each similar to the one in Figure 4. Their task was to find and click on the two numbers in each grid that summed to 10 within 20 seconds. Participants were told they would receive a bonus of $1 for each correctly identified grid. After receiving instructions for the brain teaser, participants went through a practice round to assure they understood what the task involved.

Next, participants were told, “Before moving onto the brain teaser, you have the opportunity to receive advice from the participant you have been paired with, who has received some information on how to complete the task successfully. Please indicate below if you would like to receive advice from the participant or not.” Participants chose whether or not to receive the advice from those they believed they had been assigned to at the beginning of the study. If they chose to receive the advice, they would have to wait for about a minute while, they were told, their partner wrote it down. The advice was:

Here is my advice to you . . . As soon as the matrix appears on the screen, scan it quickly row to row, from left to right. As you scan the matrix, at first pay attention only to the last digit in each cell and see if two of them would sum up to ten. When you find a pair, then look at the next digit (e.g., in a cell with 7.34 the next digit would be 3). Do the two numbers sum up to 100? if so, you can then check the first digit. Likely you just identified the two numbers that sum up to 10. It gets easier matrix after matrix.

Good luck solving the brain teaser!

A pilot study we conducted on a separate group of participants (*N* = 110) confirmed that this advice is objectively good: participants who received it performed better than those who did not have it when solving the same brain teaser in the pilot (mean = 5.39, s.d. = 2.33 vs. mean = 3.78, s.d. = 2.07, t(108) = 3.84, p < .001, d = .73).

After completing the brain teaser, participants were debriefed.

----------------------------------------------------

Insert Figure 4 about here

----------------------------------------------------

## Results

Table 5 reports the means and standard deviation for each of the variable measured in the study by condition.

----------------------------------------------------

Insert Table 5 about here

----------------------------------------------------

Perceived threat. A 2 (type of feedback: confirming vs. disconfirming) by 2 (self-assessment: explicit vs. implicit) between-subjects ANOVA with perceived threat as the main dependent measure revealed a significant main effect of type of feedback, *F*(1,591) = 242*, p* < .001, η2p = .29, such that participants who received disconfirming feedback reported feeling more threatened by the evaluation they received from their partner (mean = 3.52, s.d. = 1.70) than did those who received confirming feedback (mean = 1.69, s.d. = 1.11). The main effect of self-assessment was not significant, *F*(1,591) = 2.31*, p* = .128, η2p = .004, nor was the interaction of type of feedback and self-assessment, *F*(1,591) = 2.17*, p* = .141, η2p = .004.

Advice seeking. A lower percentage of participants who received disconfirming feedback (56.2%, 167 out of 297) chose to receive advice for the brain-teaser task as compared to those who received confirming feedback (70.1%, 209 out of 298), χ2(1, N=595) = 12.37, p < .001, Cramer’s V = .14. These results are consistent with Hypothesis 2. In a logistic regression, we found no effect for our self-assessment manipulation (p = .41) or for the interaction of type of feedback and self-assessment (p = .33).

Performance on the brain-teaser task. A 2 (feedback type) by 2 (self-assessment) between-subjects ANOVA with brain-teaser performance as the main dependent measure revealed a significant main effect of type of feedback, *F*(1,591) = 28.18*, p* < .001, η2p = .05, such that participants who received disconfirming feedback performed worse (mean = 4.33, s.d. = 2.95) than did those who received confirming feedback (mean = 5.57, s.d. = 2.74). The main effect of self-assessment was not significant, nor was the interaction of feedback type and self-assessment, both *p* > .69. We note that, consistent with the results of the pilot study, participants who sought advice did perform better on the brain-teaser task than those who did not seek advice (mean = 5.33, s.d. = 2.90 vs. mean = 4.31, s.d. = 2.83, t(593) = 4.19, p < .001, d = .36).

Mediation analyses. To provide further support for Hypothesis 3, we tested whether perceived threat mediated the relationship between our feedback conditions and the choice of advice for the brain-teaser task, using the bootstrapping approach outlined by Preacher and Hayes (2004). Based on bootstrapping (with 10,000 iterations), we estimated the direct and indirect effects of the feedback condition via perceived threat on our dependent variable, choosing to receive advice. Our manipulation had a significant effect on perceived threat (as shown by the analyses above), which, in turn, significantly affected the choice of asking for advice (*B* = -0.36, S.E.= .06, *p* < .001). In contrast, the effect of our manipulation was reduced (from *B* = .60, S.E.= .17, *p* < .001 to *B* = -.045, S.E. = .21, *p* = .83) when perceived threat was included in the equation. The 95 percent bias-corrected confidence interval for the size of the indirect effect excluded zero (-.921, -.416), suggesting that perceived threat mediated the link between the feedback condition and lower likelihood of asking for advice.

Our data also allow us to test Hypothesis 5A, which predicted that dropped relationships in response to disconfirming feedback would yield detrimental performance effects. Here, we use deciding not to take advice from the person who earlier provided feedback as a proxy for dropping a relationship. To test this hypothesis, we examined whether asking for advice mediated the relationship between our feedback conditions and performance on the brain-teaser task. Based on bootstrapping (with 10,000 iterations), we estimated the direct and indirect effects of the feedback condition via advice-seeking on performance. Our manipulation had a significant effect on advice-seeking (as shown by the analyses above), which, in turn, significantly affected performance (*B* = 0.86, S.E.= .24, *p* < .001). The effect of our manipulation was reduced (from *B* = -1.24, S.E.= .23, *p* < .001 to *B* = -1.13, S.E. = .23, *p* < .001) when advice-seeking was included in the equation. The 95-percent bias-corrected confidence interval for the size of the indirect effect excluded zero (-.242, -.042), suggesting that advice-seeking mediated the link between the feedback condition and lower performance on the brain teaser task.

**Discussion**

Together, these results provide further support for our hypotheses. They also suggest that explicit self-assessment is not a necessary condition for the emergence of our proposed effects. Additionally, Study 3 shows that the performance decrease associated with confirmation shopping is, at least in part, the result of broken or reduced-quality relationships. We argued that confirmation shopping would negatively impact employee performance by robbing the shopper of the help, advice, and support of their peers. In Study 3, we observed that shoppers’ decrease in performance was mediated by the choice to not seek advice.

**GENERAL DISCUSSION**

To improve and remain competitive, and in light of our self-deceptive tendencies, organizations employ developmental feedback processes designed to inspire greater individual effort toward personal growth and improvement and in the hope that employees will incorporate the deficiencies observed by their colleagues into personal development plans to improve. While in some cases, employees may embrace this feedback and work to improve, in a longitudinal field study and two lab studies, we found that disconfirming peer feedback is experienced as a threat to the recipient’s self-concept that leads to a reshaping of his or her networks. In Study 1, our field study, we found that employees are more likely to abandon relationships or drop projects with colleagues who previously provided disconfirming feedback. When the disconfirming feedback comes from those with whom the employee must maintain a relationship, the employee is more likely to make connections in the subsequent year with other employees who are not densely connected to their current network of employees. Additionally, we found that those who engaged in such confirmation shopping, which leads to reduced constraint scores, experienced a significant drop in performance in the following year, suggesting that there is a performance cost associated with protecting the self-concept from the harmful effects associated with performance feedback.

In Study 2, we conceptually replicated the findings in the lab, showing that individuals are more likely to drop relationships with those who provide disconfirming reviews than with those who provide confirming reviews and that this behavioral tendency is mediated by perceived threat to the self-concept. Finally, in Study 3, we again replicated our finding that disconfirming feedback leads the recipient to abandon relationships, an effect mediated by perceived threat to self-concept. We additionally found that the threat to self-concept is not conditional on the employee explicitly self-evaluating prior to receiving a peer evaluation, suggesting that the threat created by peer feedback is not simply an artifact of the self-assessment process. Finally, this study demonstrates that recipients of disconfirming feedback are less likely to seek advice from those providing the disconfirming feedback and that this unwillingness to seek advice leads to a decrease in performance in subsequent tasks. This finding helps to explain at least part of the performance effect we found in Study 1.

Our findings provide further evidence that peer feedback processes are perhaps naively envisioned and that the logical consequence of developmental feedback is not necessarily individual development. We integrate concepts from identity threat, peer feedback, and social network research to demonstrate the psychologically and organizationally harmful effects of developmental feedback as well as the influence of socially activated psychological threat on network formation over time.

**Theoretical Contributions and Practical Implications**

This study highlights a critical tension between ensuring employees’ well-being and psychological health, and providing them with critical developmental insight. Individuals do not necessarily rationally encode feedback as a developmental insight; rather, they experience it as a socially activated threat to their self-concept. We contribute to the feedback literature by demonstrating that disconfirming feedback yields a visceral psychological effect that, through various means, mutes the improvement potential associated with the feedback. The more novel contribution, though, is that people’s response to disconfirming feedback is not merely psychological in nature but also behavioral. Importantly, the effects of this behavioral tendency—namely, the reshaping of one’s social environment—are not confined to the domain of the feedback. That is, while derogation and discounting of negative feedback is targeted toward the source of the disconfirming feedback (e.g. Crocker et al., 1991; Fein & Spencer, 1997; Wyer & Frey, 1983), our findings suggest broader potentially harmful effects; responses to disconfirming feedback ripple out through the organization in the form of shifting networks.

Our work also contributes to social network research, both generally and as applied to organizations, much of which has been structuralist (Mayhew, 1980; Wellman, 1997) in nature (Borgatti & Foster, 2003). The structuralist paradigm tends to explore the effects of network structures on other outcome variables of interest and eschews the idea that individual differences can predict network characteristics (Mayhew, 1980). This study provides insight into one way through which a key network characteristic emerges; constraint shifts, in part, in response to socially activated threats to the self-concept brought on by developmental feedback processes. Our data suggest that the search for a more hospitable set of professional relationships in the face of negative peer feedback yields a network characterized by higher levels of social capital but lower subsequent performance. An important implication of these results is that the path by which an individual comes to occupy a particular position within a network matters. Specifically, our findings suggest that all constraint is not created equal; lower constraint may be generally advantageous, but if an employee arrives at that lowered constraint by virtue of network shifts triggered by negative feedback, the overall advantage seems to dissipate.

Finally, this research provides a new view into a growing body of research that envisions organizations as socially fulfilling environments. New forays into relational motivation provide evidence that social interactions within organizations can yield positive personal and organizational benefits (Grant, 2007; Grant & Berg, 2011). The growing field of positive organizational scholarship provides evidence that certain types of social relationships within organizations can be fulfilling and invigorating (Dutton & Heaphy, 2003; Dutton & Ragins, 2007) and that employees seek out these relationships at work (Wrzesniewski & Dutton, 2001). Our discipline increasingly views the social fabric of the organization as a critical facet of the employee experience and of organizational efficacy. Our work suggests that the performance systems we install within organizations can effectively rend that social fabric, causing deleterious shifts in organizational relationships that suppress many of the positive effects suggested by this broader body of research. Our framework integrates research in human resource management on developmental feedback and social psychology research on self-protection to offer a fine-grained understanding of the relationship between performance feedback and individuals’ network formation at work. With such understanding, we hope, managers can design better performance feedback systems.

**Limitations and Future Research**

Our investigation has a number of strengths. First, by pairing archival field data with laboratory data, we document a practically significant phenomenon and confirm the hypothesized causal relationship and its mechanisms in the lab. Further, our field data are longitudinal, which allows us to observe employee behaviors over time. But our study also suffers from some limitations which serve as natural prompts for future research. Although we find that confirmation shopping is associated with lower performance in the subsequent year, we do not have data to show whether there are longer-term positive effects associated with the shifts in one’s network in response to negative feedback. It is not lost on us that negative feedback might ironically lead to more advantageous network positions for the recipient. Burt (2005, 2009) suggested that lower constraint is associated with a higher degree of social capital. It is possible that the longer-term effects include more collegial relationships with colleagues—that is, that employees reshape their networks until they find a better fit. Fit seems to be important, and the maintenance of a healthy self-concept is certainly important, at least in the longer term (Chatman, 1989; Elsbach, 2003). It is not inconceivable that the “shopping for confirmation” behavior could lead to longer-term positive performance. Future research should explore the long-term benefits associated with shifts in network structure motivated by negative peer feedback.

What is more certain is that feedback is not a frictionless endeavor. Employees encountering developmental feedback face a choice: embrace a painful and threatening insight that challenges their self-concept, or change their environment in ways that eliminate or reduce the impact of these challenging insights. With our research, we aim to call for alternate approaches to prompting employee growth and development. Feedback processes are inherently threatening to employees’ self-concept and challenging to their identities. Future studies should examine more closely specific characteristics of the feedback process that might moderate those outcomes. Although our study does not explore the role of individual differences in the effects of negative feedback on network formation, we intuitively sense that individual differences matter; those who are inclined to seek feedback are likely less inclined to experience the feedback as a threat to the self-concept or to engage in confirmation-shopping behavior. How can we, then, cultivate in employees the desire for developmental insight? .

 Finally, our field context is such that employees had the ability to actively reshape their network in response to feedback-activated threats to their self-concept. We hope that this study prompts an increased interest in understanding employees’ coping mechanisms in organizational contexts where individuals do not have the ability to reform their network of relationships. An initial reaction to our data might lead a manager to simply restrict employees’ ability to forge new work relationships in response to feedback—but this policy would not ameliorate the psychological mechanism that triggers the behavioral responses we observe in our data. What actions do employees take to salve the threat experienced by feedback in more traditional contexts, and what are the ultimate organizational and individual effects of those actions? Future study should help broaden our understanding of employees’ behavioral responses in a variety of organizational contexts.

**CONCLUSION**

 Feedback processes are nearly ubiquitous in modern organizations. Managers employ these processes naively, assuming employees will respond to them with dutiful efforts to improve. But we find that negative feedback shakes the foundation of a core aspect of employees’ self-concept, causing them to respond by reshaping their networks in order to shore up their professional identity and salvage their self-concept. This reshaping of employee networks contributes to lowered performance—a result ironically at odds with the ultimate goal of performance feedback. Our research suggests that by deemphasizing developmental feedback and finding alternate methods to signal necessary improvements, organizations might promote better psychological and performance outcomes in their employees.

**References**

Alicke, M. D., Klotz, M. L., Breitenbecher, D. L., Yurak, T. J., & Vredenburg, D. S. (1995). Personal contact, individuation, and the better-than-average effect. *Journal of Personality and Social Psychology*, *68*(5), 804.

Alicke, M. D., & Sedikides, C. (2009). Self-enhancement and self-protection: What they are and what they do. *European Review of Social Psychology*, *20*(1), 1–48.

Baldwin, T. T., Bedell, M. D., & Johnson, J. L. (1997). The social fabric of a team-based MBA program: Network effects on student satisfaction and performance. *Academy of Management Journal*, *40*(6), 1369–1397.

Borgatti, S. P., & Foster, P. C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, *29*(6), 991–1013.

Brass, D. J. (1981). Structural relationships, job characteristics, and worker satisfaction and performance. *Administrative Science Quarterly*, 331–348.

Buckingham, M., & Clifton, D. O. (2001). *Now, discover your strengths*. Simon and Schuster.

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford University Press.

Burt, R. S. (2009). *Structural holes: The social structure of competition*. Harvard university press.

Campbell, D. J., & Lee, C. (1988). Self-appraisal in performance evaluation: Development versus evaluation. *Academy of Management Review*, *13*(2), 302–314.

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychology. *Psychological Bulletin*, *92*(1), 111.

Chatman, J. A. (1989). Improving interactional organizational research: A model of person-organization fit. *Academy of Management Review*, *14*(3), 333–349.

Crocker, J., Voelkl, K., Testa, M., & Major, B. (1991). Social stigma: The affective consequences of attributional ambiguity. *Journal of Personality and Social Psychology*, *60*(2), 218.

Cross, R., & Cummings, J. N. (2004). Tie and network correlates of individual performance in knowledge-intensive work. *Academy of Management Journal*, *47*(6), 928–937.

Cummings, J. N., & Cross, R. (2003). Structural properties of work groups and their consequences for performance. *Social Networks*, *25*(3), 197–210.

Davies, P. G., Spencer, S. J., & Steele, C. M. (2005). Clearing the air: identity safety moderates the effects of stereotype threat on women’s leadership aspirations. *Journal of Personality and Social Psychology*, *88*(2), 276.

Dunning, D., Meyerowitz, J. A., & Holzberg, A. D. (1989). Ambiguity and self-evaluation: The role of idiosyncratic trait definitions in self-serving assessments of ability. *Journal of Personality and Social Psychology*, *57*(6), 1082.

Dutton, J. E., & Heaphy, E. D. (2003). The power of high-quality connections. *Positive Organizational Scholarship: Foundations of a New Discipline*, *3*, 263–278.

Dutton, J. E., & Ragins, B. R. E. (2007). Exploring positive relationships at work: Building a theoretical and research foundation.

Elsbach, K. D. (2003). Relating physical environment to self-categorizations: Identity threat and affirmation in a non-territorial office space. *Administrative Science Quarterly*, *48*(4), 622–654.

Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology*, *73*(1), 31.

Gino, F. (2008). Do we listen to advice just because we paid for it? The impact of advice cost on its use. *Organizational Behavior and Human Decision Processes*, *107*(2), 234–245.

Grant, A. M. (2007). Relational job design and the motivation to make a prosocial difference. *Academy of Management Review*, *32*(2), 393–417.

Grant, A. M., & Berg, J. M. (2011). Prosocial motivation at work: When, why, and how making a difference makes a difference. *Oxford Handbook of Positive Organizational Scholarship. Oxford University Press, New York*, 28–44.

Greenberg, J. (1977). The Protestant work ethic and reactions to negative performance evaluations on a laboratory task. *Journal of Applied Psychology*, *62*(6), 682.

Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, *35*(7), 603.

Greve, H. R. (2003). *Organizational learning from performance feedback: A behavioral perspective on innovation and change*. Cambridge University Press.

Ilgen, D., & Davis, C. (2000). Bearing bad news: Reactions to negative performance feedback. *Applied Psychology*, *49*(3), 550–565.

Johnson, J. W., & Ferstl, K. L. (1999). The effects of interrater and self-other agreement on performance improvement following upward feedback. *Personnel Psychology*, *52*(2), 271–303.

Jordan, A. H., & Audia, P. G. (2012). Self-enhancement and learning from performance feedback. *Academy of Management Review*, *37*(2), 211–231.

Kay, E., Meyer, H. H., & French, j. R. P., Jr. (1965). Effects of threat in a performance appraisal interview. *Journal of Applied Psychology*, *49*(5), 311.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*(2), 254.

Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: how difficulties in recognizing one’s own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, *77*(6), 1121.

Kunda, Z. (1987). Motivated inference: Self-serving generation and evaluation of causal theories. *Journal of Personality and Social Psychology*, *53*(4), 636.

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational Behavior and Human Decision Processes*, *50*(2), 212–247.

Lewinsohn, P. M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression: the role of illusory self-perceptions. *Journal of Abnormal Psychology*, *89*(2), 203.

Mayhew, B. H. (1980). Structuralism versus individualism: Part 1, shadowboxing in the dark. *Social Forces*, *59*(2), 335–375.

Mehra, A., Kilduff, M., & Brass, D. J. (2001). The social networks of high and low self-monitors: Implications for workplace performance. *Administrative Science Quarterly*, *46*(1), 121–146.

Meyer, H. H. (1980). Self-Appraisal of Job Performance. *Personnel Psychology*, *33*(2), 291–295.

Murphy, K. R., & Cleveland, J. (1995). *Understanding performance appraisal: Social, organizational, and goal-based perspectives*. Sage.

Nag, R., Corley, K. G., & Gioia, D. A. (2007). The intersection of organizational identity, knowledge, and practice: Attempting strategic change via knowledge grafting. *Academy of Management Journal*, *50*(4), 821–847.

Nease, A. A., Mudgett, B. O., & Quiñones, M. A. (1999). Relationships among feedback sign, self-efficacy, and acceptance of performance feedback. *Journal of Applied Psychology*, *84*(5), 806.

Petriglieri, J. L. (2011). Under threat: Responses to and the consequences of threats to individuals’ identities. *Academy of Management Review*, *36*(4), 641–662.

Podsakoff, P. M., & Farh, J.-L. (1989). Effects of feedback sign and credibility on goal setting and task performance. *Organizational Behavior and Human Decision Processes*, *44*(1), 45–67.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731.

Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, *48*(2), 240–267.

Ruehlman, L. S., West, S. G., & Pasahow, R. J. (1985). Depression and evaluative schemata. *Journal of Personality*, *53*(1), 46–92.

Sedikides, C., & Alicke, M. D. (2012). *Self-enhancement and self-protection motives*. Oxford handbook of motivation, ed. R. Ryan. Oxford University Press.[rWvH].

Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology*, *38*, 183.

Sparrowe, R. T., Liden, R. C., Wayne, S. J., & Kraimer, M. L. (2001). Social networks and the performance of individuals and groups. *Academy of Management Journal*, *44*(2), 316–325.

Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: a social psychological perspective on mental health. *Psychological Bulletin*, *103*(2), 193.

Thorton, G. C. (1980). Psychometric properties of self-appraisal of job performance. *Personnel Psychology*, *33*(2), 263–271.

Vaillant, G. E. (1995). *The wisdom of the ego*. Harvard University Press.

Wellman, B. (1997). Structural analysis: From method and metaphor to theory and substance. *Contemporary Studies in Sociology*, *15*, 19–61.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, *90*(2), 245.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*(2), 179–201.

Wyer, R. S., & Frey, D. (1983). The effects of feedback about self and others on the recall and judgments of feedback-relevant information. *Journal of Experimental Social Psychology*, *19*(6), 540–559.

Yaniv, I., & Kleinberger, E. (2000). Advice taking in decision making: Egocentric discounting and reputation formation. *Organizational Behavior and Human Decision Processes*, *83*(2), 260–281.

**Figures and Tables**

**Figure 1. Theoretical model**

**+**

**+**

**-**

Disconfirming feedback

Confirmation Shopping

Perceived threat

Dropping of discretionary relationships

Seeking disconnected relationships/ reduced constraint

Performance

**Figure 2: Breakdown of self and peer-evaluations, and employee relationships, by year**



**Figure 3: Timeline of data generation for performance analyses**

December 2014

Self/Peer evaluation

January 2015

Employee Network

December 2015

Bonus Assignment

Period for which bonus is determined

**Figure 4: Example of a grid used in the brain-teaser task in Study 3**



Table 1: Descriptive statistics and correlations



Table 2: Regression results. Effect of disconfirming feedback on the likelihood of an employee dropping the relationship in the subsequent year.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
|  | LOGIT | LOGIT | LOGIT | OLS | OLS | OLS |
| VARIABLES | Controls Only | Continuous Independent Variable w/Controls | Discrete Independent Variable w/Controls | Controls Only | Continuous Independent Variable w/Controls | Discrete Independent Variable w/Controls |
| Degree Disconfirming (Continuous) |  | 1.440\*\*\* |  |  | 0.0648\*\*\* |  |
|  |  | (0.170) |  |  | (0.0223) |  |
| Disconfirming Feedback (Discrete) |  |  | 1.306\*\*\* |  |  | 0.0465\*\*\* |
|  |  |  | (0.120) |  |  | (0.0162) |
| Same Unit | 0.713\*\*\* | 0.703\*\*\* | 0.703\*\*\* | -0.0580\*\*\* | -0.0602\*\*\* | -0.0602\*\*\* |
|  | (0.0592) | (0.0583) | (0.0584) | (0.0142) | (0.0141) | (0.0142) |
| Same Location | 0.881 | 0.861\* | 0.863 | -0.0223 | -0.0262 | -0.0258 |
|  | (0.0813) | (0.0779) | (0.0786) | (0.0167) | (0.0163) | (0.0164) |
| Total # Reviews | 1.009 | 1.014 | 1.014 | 0.00152 | 0.00238 | 0.00236 |
|  | (0.0174) | (0.0175) | (0.0174) | (0.00304) | (0.00306) | (0.00304) |
| Self-rating | 0.869\* | 0.819\*\*\* | 0.830\*\* | -0.0243\* | -0.0344\*\* | -0.0324\*\* |
|  | (0.0626) | (0.0620) | (0.0620) | (0.0126) | (0.0133) | (0.0132) |
| Constant | 0.623 | 0.732 | 0.673 | 0.360\*\*\* | 0.387\*\*\* | 0.374\*\*\* |
|  | (0.184) | (0.216) | (0.199) | (0.0529) | (0.0532) | (0.0531) |
|  |  |  |  |  |  |  |
| Observations | 4,829 | 4,829 | 4,829 | 4,829 | 4,829 | 4,829 |
| R-squared |  |  |  | 0.008 | 0.011 | 0.010 |
| Specification | LOGIT | LOGIT | LOGIT | OLS | OLS | OLS |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3: OLS Regression results. Effect of non-discretionary disconfirming reviews on change in network constraint.

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
| VARIABLES | Controls Only | Year to Year Change in Constraint |
|  |  |  |
| Number of non-discretionary disconfirming reviews |  | -0.0161\*\* |
|  |  | (0.00633) |
| Total number of disconfirming reviews | 0.516\*\*\* | 0.0139\*\*\* |
|  | (0.0414) | (0.00477) |
| Self-rating | -0.169 | -0.0311\*\* |
|  | (0.140) | (0.0155) |
| Count of reviews | -0.0737\*\*\* | 0.00475\*\* |
|  | (0.0130) | (0.00212) |
| Constant | 1.207\* | 0.101 |
|  | (0.672) | (0.0816) |
|  |  |  |
| Observations | 618 | 618 |
| R-squared | 0.523 | 0.085 |
| Year Fixed Effects? | YES | YES |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4: Confirmation shopping and subsequent year performance

|  |  |  |  |
| --- | --- | --- | --- |
|  | (1) | (2) | (3) |
| VARIABLES | H5aLog Bonus | H5b Log Bonus % Controls Only | H5b Log Bonus % H4 Residuals |
| Count of Dropped Disconfirming 2014 Reviews | -0.00185(0.0073) |  |  |
|  |  |  |  |
| H4 Residual |  |  | 0.03368\*\*\* |
|  |  |  | (0.0104) |
| Total Disconfirming Reviews, 2014 | -0.00260 | -0.00303\* | -0.00318\* |
|  | (0.0020) | (0.0017) | (0.0016) |
| 2014 Average Peer-rating | 0.03454\* | 0.03499 | 0.03987\*\* |
|  | (0.0200) | (0.0206) | (0.0183) |
| 2015 Average Peer-rating | 0.02800\*\* | 0.02693\*\* | 0.02292\*\* |
|  | (0.0101) | (0.0106) | (0.0094) |
| Gender (F = 1) | -0.02760 | -0.02826 | -0.02971\* |
|  | (0.0166) | 0.0167 | 0.0170 |
| Constant | -0.13950\*\* | -0.13693\*\* | -0.13916\*\* |
|  | (0.0566) | (0.0530) | (0.0506) |
|  |  |  |  |
| Observations | 138 | 138 | 138 |
| R-squared | 0.130 | 0.124 | 0.163 |
| Number of Business Units | 27 | 27 | 27 |
| Business Unit Fixed Effects | YES | YES | YES |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5: Means and standard deviations for each of the variables measured, by condition, in Study 3



1. We note that the exact items changed over the course of the four years. The most notable difference is that, over the four-year period, the total number of items went from 34 to 20. The general categories remained stable, but the organization stripped away some items that seemed repetitive. The company aggregates the totals in the report; thus, we kept the same approach in analyzing the data. However, we note that there are seven distinct categories, and the items all load strongly into a single factor (even when the analysis is conducted separately for each year). [↑](#footnote-ref-1)
2. Prior to being randomly assigned to conditions, participants answered two questions used as attention checks. Participants who did not answer these questions correctly were automatically redirected to a page that indicated they could not proceed with the study based on their answers. Thus, their data were not recorded. [↑](#footnote-ref-2)