

DOES NEGATIVE FEEDBACK BENEFIT (OR HARM) RECIPIENT CREATIVITY? THE ROLE OF THE DIRECTION OF FEEDBACK FLOW

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Negative feedback alerts recipients to a creativity–standard gap, and thus may offer an opportunity to improve creativity. However, existing theories and empirical evidence are contradictory, with the literature containing evidence of positive, negative, and null relationships between negative feedback and recipient creativity. The goal of our research is twofold: first, to organize the contradictory theories under a comprehensive theoretical framework, and, second, to resolve the inconsistency between negative feedback and recipient creativity. Across two studies—a quasi-field experiment and a laboratory experiment—we find that the direction of feedback flow determines the nature of the relationship between negative feedback and recipient creativity, via two distinct mechanisms: task processes and meta-processes. Negative feedback increases recipient creativity in the bottom-up feedback flow (from followers to supervisors), because it heightens the recipients’ focus on task processes, whereby the recipients focus on the generation of better task strategies to close the creativity–standard gap. In contrast, in the top-down (from supervisors to followers) or lateral (between peers) feedback flows, negative feedback heightens the recipients’ focus on meta-processes—a psychological state in which recipients feel threatened by negative feedback—and thus hinders recipient creativity.

Employee “creativity”—defined as the production of ideas that are both novel and useful (Amabile, 1983; Oldham & Cummings, 1996)—is a foundation of organizational success (Anderson, Potočnik, & Zhou, 2014). It allows organizations to continually produce innovative products and keep them competitive in the market. Accordingly, understanding how to improve employee creativity has been a longstanding preoccupation of management scholars (e.g., George, 2007; Perry-Smith, 2006). Since creativity involves a departure from the current ways of thinking and behaving, employees often attempt to

provide other organizational members with negative feedback to create dissatisfaction with the status quo or the current levels of creativity (Ilgen, Fisher, & Taylor, 1979). Negative feedback highlights problems with current creativity, generating awareness of a gap between current creativity and the standards. Once the gap is recognized, employees may be motivated to close the gap by improving their current creativity.

However, this argument has received limited empirical support. In fact, the evidence is completely equivocal. Some scholars suggest that negative feedback has no direct effect on recipient creativity (Fodor & Carver, 2000; George & Zhou, 2001), while others suggest that negative feedback inhibits it (Ilies & Judge, 2005; Van Dijk & Kluger, 2011; Zhou, 1998). We know of only three studies (Fang, Kim, & Milliken, 2014; Ford & Gioia, 2000; Vuori & Huy, 2015) that provide evidence to support that negative feedback might be positively associated with recipient creativity. Such perplexing empirical evidence indicates that a basic question remains unanswered: “How and why does negative feedback influence creativity?”

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To answer this question, the present research draws upon feedback intervention theory (Kluger & DeNisi, 1996) to derive a parsimonious and coherent theoretical account of the link between negative feedback and creativity. Feedback intervention theory argues that negative feedback makes feedback recipients aware of the gap between their current level of creativity and the standards (the “creativity–standard gap”) and that such awareness leads the recipients to engage in one of two functionally opposite mechanisms in response to the negative feedback. The first mechanism concerns “task processes,” whereby recipients make constructive improvements by engaging in the process of generating better task strategies. They identify problems with their current behavior in creativity tasks, design more useful and novel strategies for their creativity tasks, and implement those strategies. The second mechanism involves “meta-processes,” and refers to the psychological state in which recipients feel threatened by negative feedback. Feedback recipients who engage in meta-processes feel that their ego, or self-concept, is threatened by the negative feedback, deterring them from experimentations and creative attempts to improve their creativity. Despite its usefulness in illustrating why negative feedback is inconsistently related to recipient creativity, a notable limitation of feedback intervention theory is that it does not elaborate on *when* negative feedback recipients attend to either of the two processes.

The main objectives of this paper are to organize the inconsistent theories and empirical findings under the two mechanisms—task processes and meta-processes—and to resolve the inconsistency between negative feedback and recipient creativity by introducing an important, but neglected, boundary condition: the direction of feedback flow. The direction of these flows include bottom up (i.e., from followers to supervisors), top down (i.e., from supervisors to followers), and lateral (i.e., from peers to peers). We suggest that, in the bottom-up feedback flow, negative feedback increases recipient creativity through task processes, whereas, in the top-down and lateral feedback flows, negative feedback decreases recipient creativity through meta-processes. In organizations, supervisors have asymmetric control over valuable organizational resources, such as monetary rewards, promotions, training opportunities, and budgets and materials for completing tasks. Followers do not have such control, and their supervisors determine their access to organizational resources. This power asymmetry often causes these two parties to have completely different psychological

mindsets (Keltner, Gruenfeld, & Anderson, 2003; Magee & Galinsky, 2008). Researchers have found that power asymmetry leads the powerful (e.g., supervisors) to be approach oriented (vs. inhibition oriented) toward negative evaluations by the powerless (e.g., followers), while the powerless become inhibited by negative evaluations by the powerful (Keltner et al., 2003). In addition, the powerful tend to maintain high levels of task focus in the face of task-related criticisms and care less about their social relationships with feedback senders, whereas the powerless behave in an opposite way (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008; Smith, Jostmann, Galinsky, & Van Dijk, 2008; Steele, Spencer, & Aronson, 2002). Based on these findings, we expect that negative feedback increases recipient creativity via task processes in the bottom-up feedback flow and decreases recipient creativity via meta-processes in the top-down feedback flow.

The relationship between the feedback sender and the recipient in the lateral feedback flow is qualitatively different from that in the bottom-up and top-down feedback flows. A peer relationship does not involve differential social power. Instead, this relationship is characterized by rivalry, or competition, given that organizational resources (e.g., promotions and pay increases) are limited. Thus, employees strive to stand out among their peers and become increasingly concerned about the possibility of lagging behind them (Bandura, 1977; DeNisi, Randolph, & Blencoe, 1983; Festinger, 1962). Peer competition sometimes produces positive organizational outcomes (for a review, see Birkinshaw, 2001). However, regarding negative feedback between peers, evidence has shown that the competitive and non-hierarchical nature of a peer relationship leads employees to interpret lateral negative feedback as an attempt to downplay their ability and an attack on their self-esteem. For this reason, those who receive lateral negative feedback have reported that they feel threatened, distracted, and discouraged (Brett & Atwater, 2001; DeNisi et al., 1983; Druskat & Wolff, 1999; Rogers & Feller, 2016). That is, negative feedback from peers distracts recipients from creativity tasks—low task processes—and causes them to pay greater attention to meta-processes, which reduces their creativity.

The current research tests these hypotheses in two studies: Study 1 is a quasi-field experiment at a Korean company and Study 2 is a laboratory experiment at a large North American university. By demonstrating consistent support for our hypotheses across the two studies, our research makes important

contributions to the literature. We not only resolve the inconsistency of the relationship between negative feedback and recipient creativity but also integrate several theoretical arguments, variably applied in past research, under two essential mechanisms: task processes and meta-processes. In addition, we push the boundary of feedback intervention theory by providing an important, albeit neglected, boundary condition—the direction of feedback flow—which determines the mechanisms underlying the relationship between negative feedback and creativity. Figure 1 depicts our theoretical framework.

THEORETICAL DEVELOPMENT

Defining Negative Feedback

“Feedback” herein refers to information regarding whether one’s level of creativity meets the organizational standard(s). When feedback provides information indicating a “creativity–standard gap”—that is, a discrepancy showing that the demonstrated level of creativity is below the accepted standard—the feedback is considered “negative.” We propose to investigate negative feedback in relation to recipient creativity for two reasons. First, from a theoretical perspective, negative feedback has strong potential to contribute to recipient creativity. If the feedback recipients are receptive, negative feedback identifies the insufficiency in their current level of creativity and creates dissatisfaction where none previously existed. This dissatisfaction is important because creativity is often derived from the rejection of previous thought patterns and behavior, and negative feedback informs feedback recipients that their current levels of creativity should be improved in more novel and useful ways (George, 2007; Zhou & George, 2001). Second, negative feedback is prevalent in organizations and a primary means by which managers influence employee behavior and performance (Ilgen et al., 1979). For example, according to Zenger and Folkman’s (2017) study of 328 managers and approximately 4,200 followers (13 followers per manager on average), the managers perceived themselves as effective leaders when they offered criticism or negative feedback, and, thus, they frequently offered negative feedback to followers to induce meaningful changes in the followers’ behavior and performance. This led the followers to perceive that negative feedback was pervasive in their organizations. Considering its utility for recipient creativity and the pervasiveness in organizations, we believe that a systematic

investigation of negative feedback and its effects on recipient creativity is important. In the following sections, we review past research on the relationship between negative feedback and recipient creativity and identify both theoretical and empirical inconsistencies in this relationship.

Inconsistent Theories and Empirical Evidence on Negative Feedback and Creativity

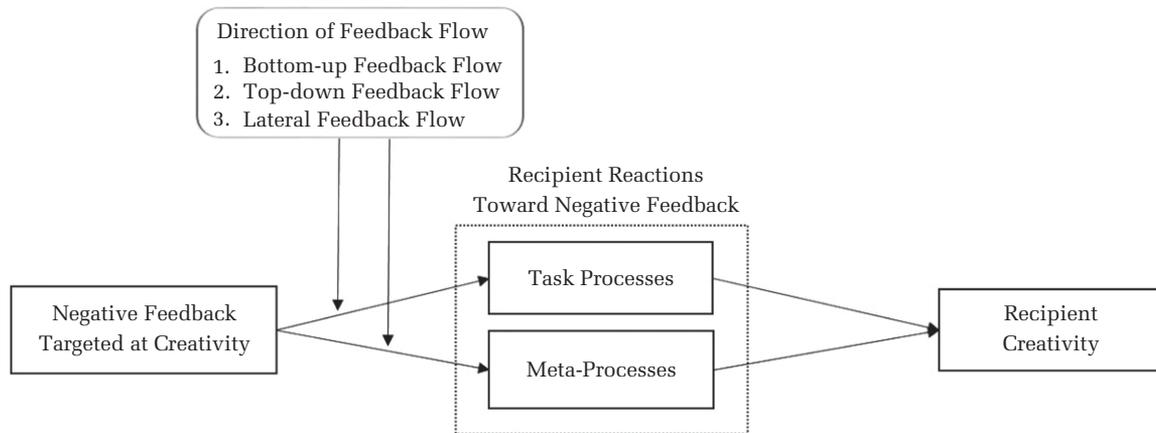
Our comprehensive review of past research on the link between negative feedback and recipient creativity revealed perplexing results; past studies have used a variety of contradicting theories and have reported a mix of positive, negative, and null relationships. Table 1 summarizes the contexts and results of past studies.¹

Researchers who found a positive relationship between negative feedback and creativity shared a similar perspective (Fang et al., 2014; Vuori & Huy, 2015). These authors argued that negative feedback creates dissatisfaction with their current level of creativity. This dissatisfaction in turn incentivizes feedback recipients to look closely at the processes involved in creativity tasks in order to identify opportunities for improvement and fill the gap by implementing better task strategies. In contrast, the researchers who found a negative relationship between negative feedback and recipient creativity focused on the perceived threat resulting from negative feedback (Van Dijk & Kluger, 2011; Zhou, 1998). This perspective suggests that negative feedback threatens recipients’ core beliefs about themselves, their abilities, and their status in the eyes of others and that the experience of a threatened self-concept reduces creativity because threatened recipients disengage from any experimentation and creative attempts to improve their creativity.

Both of these theoretical perspectives reveal fundamental aspects of the negative feedback–creativity relationship, and, therefore, the present research strives to integrate the two perspectives into a broader framework. To accomplish this integration, we utilize feedback intervention theory (Kluger & DeNisi, 1996), which parsimoniously incorporates the two theoretical perspectives.

¹ Two studies in this section (Fodor & Carver, 2000; Zhou, 1998) did not report the main effect of negative feedback on creativity. Thus, we manually calculated the effect using the means, standard deviations, and degrees of freedom reported in the papers.

FIGURE 1
Theoretical Framework



Reconciling the Inconsistent Negative Feedback–Creativity Relationship

The primary theoretical innovation of feedback intervention theory (Kluger & DeNisi, 1996) lies in the introduction of two separate processes—task processes and meta-processes—that are used to explain how a feedback recipient responds to negative feedback. “Task processes” refer to the mechanisms

by which feedback recipients attempt to improve their current creativity by generating better, diverse strategies for their creativity tasks. In creativity tasks, the most common pitfall is that of using existing or routinized task strategies. Employees who work on creativity tasks tend to overly rely on existing task strategies, or task routines, and they are less inclined to experiment with new task strategies. This is because employees routinize existing task strategies

TABLE 1
Summary of Studies Linking Negative Feedback and Recipient Creativity

Study and Context	Feedback Directions	Findings
Laboratory experiment with undergraduate students (Zhou, 1998)	Top down	[Negative] Participants who received negative feedback showed lower creativity than those who received positive feedback.
Laboratory experiment with undergraduate students (Fodor & Carver, 2000)	Top down	[Null] Creativity in the negative feedback condition was not statistically different from creativity in the positive feedback and control conditions.
Interviews and survey with managers in the eastern United States (Ford & Gioia, 2000)	Bottom up	[Positive] Negative feedback was positively related to decision creativity.
Field survey with professional employees (George & Zhou, 2001)	Top down	[Null] There was a non-significant correlation between feedback valence and creative behavior.
Laboratory experiments with undergraduate students (Ilies & Judge, 2005)	Top down	[Negative] Participants who received negative feedback showed downward goal revision in Remote Associates Test.
Laboratory experiments with undergraduate students (Van Dijk & Kluger, 2011)	Not specified	[Negative] Negative feedback lead to a reduced number of ideas generated compared to positive feedback.
Field survey with professional employees (Hon et al., 2013)	Top down	[Null] There was a non-significant correlation between negative feedback and creativity.
A simulation model study (Fang et al., 2014)	Not specified	[Positive] Sugarcoating or distorting negative feedback reduced organizational learning, which in turn decreased innovation.
Qualitative interview study with Nokia’s managers and external experts (Vuori & Huy, 2015)	Bottom up	[Positive] Middle managers blocked the flow of negative feedback to upper management, which hampered innovation.

over time through repeated exposure (Kilduff, 1993; March, 1991; March & Simon, 1958). Employees' tendency to stick to existing task strategies could increase their routine performance because it ensures that employees reliably perform their routine tasks without errors. However, this tendency is detrimental to creativity because creativity often requires deviation from routines and the status quo (Anderson et al., 2014; Zhou & George, 2001). Indeed, the evidence has shown that employees increased their creativity by experimenting with new ways of performing their tasks, while sticking to existing task strategies hampered their creativity (Anderson et al., 2014; Kim & Zhong, 2017; March, 1991). In other words, task processes are essential mechanisms for employee creativity. Task processes are highly congruent with the theories used in past research that found a positive relationship between negative feedback and creativity (e.g., Fang et al., 2014; Vuori & Huy, 2015).

Alternatively, "meta-processes" refer to the mechanism whereby negative feedback threatens recipients' beliefs about their self-concept, their ability to perform creativity tasks, and their social image perceived by feedback senders. Responding to negative feedback by attending to meta-processes, recipients direct their attention toward the threatening consequences of negative feedback. Specifically, recipients worry about how negative feedback affects the assessments of their own ability (e.g., "Does this feedback suggest that I'm incompetent?") or whether negative feedback implies changes in the recipients' important social relationships (e.g., "Does this mean that my supervisor does not like me?"). This threatened mindset inhibits recipients from taking risks by experimenting with creative ideas (Förster, Friedman, & Liberman, 2004; Friedman & Förster, 2001; Kluger & DeNisi, 1996) and lowers the mental resources and cognitive capacity that should be allocated to creative processes (see, for a review, Byron, Khazanchi, & Nazarian, 2010). Thus, meta-processes prevent recipients from directly addressing the problems with their current level of creativity and leave them in a threatened mindset, which in turn reduces their creativity. Meta-processes are in line with the logic presented by the past research that found a negative relationship between negative feedback and recipient creativity (e.g., Van Dijk & Kluger, 2011; Zhou, 1998).

In summary, feedback intervention theory suggests that negative feedback has the potential to both increase and decrease creativity via task processes and meta-processes. Therefore, it is not surprising

that past researchers have reported contradictory empirical evidence on the relationship between negative feedback and recipient creativity. Despite its usefulness in understanding the inconsistent relationship, feedback intervention theory does not offer insight into *when* negative feedback recipients adopt one of these two processes. Our research aims to expand feedback intervention theory by investigating an important, albeit neglected, boundary condition that channels negative feedback to creativity through task processes and meta-processes. We suggest that the direction of feedback flow is the *sine qua non* for understanding the relationship between negative feedback and recipient creativity and resolves the inconsistency in this relationship.

The Role of the Direction of Feedback Flow

We define the "direction of feedback flow" as the transfer of feedback from sender(s) to recipient(s) wherein the two parties have the same or different organizational ranks. We argue that the direction of feedback flow should not be isolated from feedback research because feedback does not occur spontaneously in organizations. Rather, it occurs within the social, organizational contexts that create the basis of the evaluation standards. Employees try to meet the standards, and evaluators rate employee creativity by considering the gap between demonstrated creativity and the standards (De Stobbeleir, Ashford, & Buyens, 2011; Zhou, 2008). As a result, in a study of feedback, it is necessary for researchers to specify the social and organizational contexts, including the identities of the feedback sender(s) and recipient(s) (Zhou, 2008). By introducing a novel concept—the direction of feedback flow—the current research specifies the social and organizational context within which negative feedback flows, and examines its influences on the relationship between negative feedback and recipient creativity.

Specifically, we investigate three directions of feedback flow: "bottom up" (from followers to supervisors), "top down" (from supervisors to followers), and "lateral" (from peers to peers). Although the top-down feedback flow may be the most frequently observed direction, organizations are beginning to realize the value of feedback that flows up the hierarchy and feedback that flows laterally between employees at the same organizational rank (Antonioni, 1996; Brett & Atwater, 2001; DeNisi & Kluger, 2000). Nevertheless, a comprehensive and systematic investigation on the roles of the direction of feedback flow is lacking in organizational

research. The majority of past research has considered only top-down feedback (e.g., Fodor & Carver, 2000; George & Zhou, 2001; Zhou, 1998). A small minority of the research has looked at bottom-up feedback (e.g., Ford & Gioia, 2000; Vuori & Huy, 2015), and other research did not specify the senders and recipients (e.g., Fang et al., 2014; Van Dijk & Kluger, 2011). Interestingly, researchers who examined the top-down feedback flow generally found a negative relationship between negative feedback and creativity, while those who investigated the bottom-up feedback flow found a positive relationship. These results show the importance of the direction of feedback flow as a boundary condition in the relationship between negative feedback and creativity. We theorize that each direction of feedback flow determines a feedback recipient's focus—that is, toward task processes versus meta-processes—and its subsequent effect on creativity.

Bottom-Up and Top-Down Negative Feedback Flows and Creativity

The bottom-up feedback flow. Research on social power provides a basis for understanding how bottom-up and top-down feedback flows influence the relationship between negative feedback and creativity. “Social power” refers to asymmetric control over valuable resources, rewards, punishments, and outcomes (Keltner et al., 2003; Magee & Galinsky, 2008). Differences in hierarchical rank create a situation in which an employee at a higher rank possesses social power over other employees at lower ranks; accordingly, manipulations of the hierarchical rank have been frequently used to study social power and its effects (e.g., DeNisi et al., 1983; Jordan, Sivanathan, & Galinsky, 2011).

Our research relies on the social power literature to suggest that the bottom-up feedback flow enables negative feedback recipients (in this case, supervisors) to attend to task processes rather than to meta-processes. Regardless of their findings, the feedback researchers listed in Table 1 acknowledged that negative feedback hurts recipients' feelings to a certain degree, as it criticizes some aspects of their current creativity. To utilize negative feedback constructively, recipients should understand it strictly within the boundary of the tasks rather than expanding its implications to personal or task-unrelated matters (e.g., concerning their image in the eyes of the feedback sender). Research on social power has shown that supervisors may be able to do so better than followers, for several reasons. One major reason

for this difference is that supervisors tend to be more approach oriented toward the dissenting, counter-attitudinal opinions provided by their followers. Supervisors are aware that their followers generally cannot engender serious social consequences (e.g., pay decreases and demotions) as followers have neither the formal authority nor social power to do so (Bacharach & Lawler, 1980; Emerson, 1962; Pfeffer & Salancik, 1974; Yukl, 2010). Such awareness helps supervisors better cope with the uncomfortable feelings that negative feedback elicits and be more approach oriented to the potential positive outcomes that could be attained by changing their behaviors and correcting the problems. In line with this argument, Keltner et al. (2003: 268–269) suggested that:

The experience of power involves the awareness that one can act at will without interference or serious social consequences . . . Being unconstrained by others' evaluations or the consequences of one's actions, people with elevated power should be disposed to elevated levels of approach-related affect, cognition, and behavior.

In addition, social power tends to increase task-focused and goal-directed behaviors (Karremans & Smith, 2010; Smith et al., 2008; Steele et al., 2002). As mentioned earlier, the main purpose of providing negative feedback is to identify the creativity–standard gap in order to help recipients close this gap by improving their current level of creativity. However, negative feedback often distracts recipients' focus from their task and directs their attention to task-irrelevant matters, such as concern about their image in the eyes of others (Kluger & DeNisi, 1996). Therefore, as long as recipients can maintain their focus on their creativity task, they are more likely to utilize negative feedback to improve creativity. Evidence from the social power literature has shown that the powerful, relative to the powerless, can better plan and update task-relevant information and suppress their attention to task-irrelevant information in order to achieve their goals (Smith et al., 2008; Smith & Trope, 2006), even when the information threatens their self-image (Beilock, Rydell, & McConnell, 2007; Steele et al., 2002).

Finally, social distance theory (Magee & Smith, 2013) provides a relational perspective regarding why the bottom-up feedback flow may positively relate negative feedback to recipient creativity. This theory suggests that high-power employees have a greater sense of social distance; namely, “a subjective perception or experience of distance from

another person or other persons” (Magee & Smith, 2013: 2). With the heightened level of social distance, high-power employees pay less attention to their social relationships with others; instead, they tend to strengthen their focus on the achievement of ultimate goals and maintain high levels of self-control in the process of goal pursuit. Furthermore, in anticipation of social disapproval, the sense of social distance keeps high-power employees from feeling socially engaging emotions, such as embarrassment and feeling threatened, since they value communal, intimate social relationships less (Magee & Smith, 2013). Thus, in the bottom-up negative feedback flow from followers to supervisors, supervisors’ sense of social distance is likely to help them maintain their focus on creativity tasks and overcome the ego-threatening implications of negative feedback. In summary, in the bottom-up feedback flow, supervisors likely utilize negative feedback for their creativity by attending to task processes rather than meta-processes.

The top-down feedback flow. In contrast to the bottom-up feedback flow, the top-down feedback flow may lead feedback recipients (i.e., followers) to respond to negative feedback by attending to meta-processes instead of task processes, as the asymmetrical social power in the supervisor–follower relationship likely leads followers to be more vigilant to criticism from their supervisor and more concerned about their image in the eyes of their supervisors. In general, employees have a strong desire to maintain their membership in the organization and move up the organizational hierarchy. To do so, they need favorable evaluations and support from their supervisors as supervisors have the power to satisfy or impede their desires. As stated by Keltner et al. (2003: 269):

Less powerful individuals have less access to material, social, and cultural resources and are more subject to social threats and punishments. Thus, they are more sensitive to the evaluations and potential constraints of others.

Furthermore, as suggested above, people with low social power, relative to those with high social power, tend to decrease their task-focused attention and fail to suppress their attention to task-irrelevant information (Smith et al., 2008; Smith & Trope, 2006). This is even more pronounced when information that threatens the recipients’ self-image (e.g., negative feedback) is present (Beilock et al., 2007; Steele et al., 2002). Finally, low-power people tend to have a low social distance and value social relationships with others, rendering them more vigilant to negative

feedback and criticisms from others (Magee & Smith, 2013). Taken together, we argue that the top-down feedback flow likely directs feedback recipients’ (i.e., followers’) focus away from task processes to meta-processes, which is detrimental to their creativity.

Lateral Negative Feedback Flow and Creativity

While the bottom-up and the top-down feedback flows involve hierarchical relationships in which social power is asymmetrical, the lateral feedback flow does not involve social power differences between senders and recipients. Instead, it is often characterized as a competitive relationship in which peers strive to attain limited organizational resources (e.g., promotions, pay increases, or training opportunities; Magee & Galinsky, 2008). Rarely, in organizations with a social hierarchy that does not resemble a pyramid, competition may not be an essential feature because such organizations have several higher positions available, allowing all employees to move up the hierarchy. “Many real-world situations, by contrast, offer rewards that depend on an individual’s performance relative to others” (O’Keeffe, Viscusi, & Zeckhauser, 1984: 27), and the number of people at the top is significantly smaller than the number of people at the bottom (Magee & Galinsky, 2008). Thus, competition is an inherent characteristic that defines employee relationships in most organizations.

However, this does not mean that the workplace is “the war of all against all.” Instead, employees most likely compete only with their “reference group,” a term that refers to a group of employees whose behaviors and performance are compared against each other (Bandura, 1977; Festinger, 1962). The selection of a reference group is based on shared similarities in members’ experience and ability (Festinger, 1954; Mumford, 1983). In organizations, as peers have similar levels of work tenure, experience, ability, and knowledge, peer groups become the reference groups (Bandura, 1977, 1978, 2001). Most importantly, social comparisons based on appropriate reference groups are related to employee perceptions of organizational justice. Unfair comparisons for performance ratings (e.g., between followers and leaders) significantly undermine employee perceptions of both distributive and procedural fairness (Bandura, 1977; Festinger, 1962), which results in detrimental organizational outcomes, such as high levels of turnover, low commitment, low job satisfaction, and low job performance (see, for a review, Colquitt, Conlon, Wesson, Porter, & Ng, 2001). Therefore, organizations assess employee performance

through social comparisons within a peer group and provide employees with results in the form of performance feedback (Mumford, 1983).

Regarding the lateral negative feedback flow, the nonhierarchical and competitive nature of peer relationships is likely to direct recipients' focus toward meta-processes and away from task processes. In a peer relationship, recipients likely interpret lateral negative feedback in an unproductive way because they are concerned about the possibility of lagging behind their competitors and because they strive to stand out among their peers (Bendersky & Shah, 2012; Cho, Overbeck, & Carnevale, 2011; DeNisi et al., 1983; Rogers & Feller, 2016; Tauer & Harackiewicz, 1999). For this reason, lateral negative feedback "could be viewed as an attack on self-esteem" and as an attempt to downplay a competitor's abilities (DeNisi et al., 1983: 458). Several researchers have provided empirical evidence that lateral negative feedback induces the negative responses of feedback recipients, particularly in relation to meta-processes. For instance, DeNisi et al. (1983) designed a longitudinal laboratory experiment to test whether lateral negative feedback causes recipients to exhibit negative reactions. They manipulated the lateral negative feedback by simply indicating that it came from a peer, and they found that recipients demonstrated unproductive reactions. The lateral negative feedback decreased recipients' satisfaction with and trust in (or cohesiveness with) their peers; ultimately, it significantly impaired the recipients' task focus.

Following DeNisi et al. (1983), several other researchers have provided further evidence that lateral negative feedback threatens recipients' self-concept and distracts from their task focus. For example, Druskat and Wolff (1999) found that, even though lateral negative feedback had a developmental purpose, recipients perceived it as detrimental to peer communication, recipient development, peer cohesion, satisfaction with peers, and the viability of their peer group. Brett and Atwater (2001) offered more direct evidence that lateral negative feedback threatens recipient ego and self-image. In their study, recipients of lateral negative feedback reported that they felt discouraged, criticized, and confused by this feedback. More recently, Rogers and Feller (2016) showed that, when people identified a negative gap between their creative performance (i.e., levels of excellence in essay writing) and a peer's creative performance (i.e., the reference point), they felt that their self-image and perceived abilities were threatened. Participants reported that they felt discouraged and disappointed by the gap and that they were not the right person for the creativity task. In addition, the recipients perceived

that their writing would not attain the same levels of excellence as their peers' essays, and, as a result, their task focus was significantly distracted. Relying on these findings, we suggest that the lateral negative feedback flow likely leads negative feedback recipients to attend to meta-processes rather than to task processes, which will ultimately reduce their creativity.

To summarize, we suggest that the direction of feedback flow is an important boundary condition of the negative feedback and creativity relationship. The bottom-up negative feedback helps recipients come up with better task strategies for their creativity tasks (task processes), which subsequently increases their creativity. In contrast, top-down and lateral negative feedback directs recipients' focus away from creativity tasks to task-irrelevant matters, such as concerns about their ability, their social relationships with feedback senders, and their self-concept (i.e., meta-processes), which prevents them from engaging in experimentation and creative attempts, and, in turn, decreases their creativity. Thus, we propose the following two hypotheses:

Hypothesis 1. The relationship between negative feedback and recipient creativity is moderated by the direction of feedback flow; in the bottom-up feedback flow, negative feedback is positively associated with recipient creativity, whereas, in the top-down and lateral feedback flows, negative feedback is negatively associated with recipient creativity.

Hypothesis 2. Task processes and meta-processes mediate the relationship between negative feedback, the direction of feedback flow, and recipient creativity; in the bottom-up feedback flow, task processes mediate the positive relationship between negative feedback and recipient creativity, whereas, in the top-down and lateral feedback flows, meta-processes mediate the negative relationship between negative feedback and recipient creativity.

OVERVIEW OF THE STUDIES

We conducted two studies—one quasi-field experiment and one laboratory experiment—to test our theoretical model. Both studies tested the full moderated mediation model. In Study 1, we recruited 225 employees who were working in creative jobs—designing new products, researching and developing new products, and developing marketing plans—in a Korean company. Employees were quasi-randomly assigned to one of three conditions pertaining to the direction of feedback flow: bottom up, top down, or lateral. The company employed bottom-up, top-down, and lateral feedback in their quarterly evaluations. Relying on this natural organizational setting,

we measured employee perception of the extent to which their quarterly evaluation was negative. Creativity was measured by focal employees' superiors two months after the quarterly evaluations. Study 2 sought to replicate the results of Study 1 with 356 undergraduate students in a large North American university. We conducted a laboratory experiment to provide evidence of causality by manipulating both negative feedback and the direction of feedback flow.

STUDY 1: QUASI-FIELD EXPERIMENT

Procedure

We conducted the study in the product development and management department at a health food company in Korea. The main duties of employees in this department were (a) designing new products, (b) researching and developing new products, and (c) developing marketing plans (e.g., promotion, advertisement) for new products. According to our interviews with the three executives of this company, creativity is the defining job characteristic of employees in the department, and, in formal performance evaluations, employees are rated regarding how creative they have been in their jobs. The company operates with a team-based structure, and one team leader manages each team. Each team also has a deputy team leader, who acts as a team leader when necessary. The team leader reports to his/her division head. In our study, we measured the top-down, bottom-up, and lateral feedback received by focal employees in the natural context of the company's official quarterly evaluations. Two months later, we collected ratings of the focal employees' creativity from their superiors.

The company provides employees with quarterly performance feedback—in March, June, September, and December. In alternating quarters, *team members* (or followers in each team) receive lateral feedback from their peers (in March and September) and top-down feedback from their team leader (in June and December). *Team leaders* also receive feedback from different sources in alternating quarters. Since team leaders have limited contact with their peers, they receive bottom-up feedback from their team members, instead of receiving lateral feedback in March and September. In June and December, team leaders receive feedback from their division heads. The feedback that employees receive (regardless of its source) includes both a *numerical evaluation* and *written feedback*. The numerical evaluation ranges from 0% to 100%; the higher the score, the better the employee performance. In the written feedback, a

feedback sender specifies a recipient's strengths, weaknesses, and any other information that the sender thinks is important for improving the recipient's task behavior.² We coordinated our data collection with an executive member of the human resources department, who allowed us to collect data from one focal employee per team.

Relying on the unique, natural setting of this company, we designed a quasi-field experiment using March and June quarterly evaluations. We created the quasi-field experimental conditions, manipulating the direction of feedback flow by selectively inviting participants in either the March or the June evaluations. That is, we created three conditions, and each condition contained about one third of the sample. The bottom-up feedback flow condition contained team leaders who received feedback from their team members in the March evaluation. The lateral feedback flow condition contained team members who received feedback from their peers in the March evaluation. The top-down feedback flow condition contained team members who received feedback from their supervisors in the June evaluation. To create the three conditions, in the beginning of March, we sent out an invitation email to all team members and team leaders at the product development and management department. After receiving responses from employees who were willing to take part, we selected one participant from each team and assigned them to a condition before they received their quarterly feedback at the end of March. When multiple team members from the same team volunteered for this

² The numerical evaluations in the bottom-up and lateral feedback flows are averaged across raters, as there are multiple raters (i.e., multiple followers for the bottom-up feedback flow and multiple peers for the lateral feedback flow), whereas, in the top-down feedback flow, the score is not averaged, as there is only one rater (i.e., supervisor). Thus, in the numerical evaluations, raters in the bottom-up and lateral feedback flows are anonymous, whereas the top-down feedback flow reveals the identity of the feedback sender. However, the written feedback is done *non-anonymously*—the company has all the feedback senders specify their names so that the feedback recipients can receive further feedback after the quarterly evaluations. Note that it is the top-down evaluation that determines the final grade of each employee at the end of the year; the bottom-up and lateral feedback are for informative and developmental purposes. This setting is in line with that of the majority of organizations in which supervisors control employee performance evaluation and other important organizational resources, as we theorized earlier.

study, we randomly selected one. When a team leader and team members from the same team volunteered, we randomly chose one, if possible, but were forced to preferentially choose supervisors in some cases in order to ensure equal distribution of the number of participants across conditions (among the volunteers, there were obviously more team members than team leaders, which gave us a larger available pool of the former than the latter). For this reason, this study is a *quasi*-field experiment in which we quasi-randomly, rather than fully randomly, invited participants to the three conditions.

Following completion of the recruitment process, researchers visited the company within a week of employees receiving their March and June quarterly evaluations to measure negative feedback, task processes, and meta-processes. Two months after each of our visits (i.e., in May and August, respectively), we measured creativity from a focal employee's superior. Thus, the data collection occurred at four distinct time points, but the data were collapsed to create two waves of time-lagged data. Time 1 represented the points at which negative feedback, task processes, and meta-processes were measured, and Time 2 (two months after Time 1) represented the point at which superiors evaluated the focal employees' creativity. The final data encompassed 225 employees (response rate = 54.61%; $N_{\text{Bottom-up negative feedback}} = 80$, $N_{\text{Lateral negative feedback}} = 73$, $N_{\text{Top-down negative feedback}} = 72$). The sample contained 104 females (45.34%) and 121 males (54.66%), with an average age of 32.38 years ($SD = 4.65$). The average tenure of our sample was 6.37 years ($SD = 2.69$). The majority of employees had completed a bachelor's degree (87.6%) and 12.4% had completed graduate degrees.

Manipulation and Measures

We created Korean versions of the surveys by following the survey translation procedures recommended by Brislin (1990). All measures used a Likert scale, with responses ranging from "1" (*strongly disagree*) to "7" (*strongly agree*).

The direction of feedback flow. As previously mentioned, we manipulated the direction of feedback flow by collecting data from employees in the different positions (either team members or team leaders) in the different quarterly evaluations (in March and June). This allowed us to create three conditions: the top-down feedback flow condition (feedback recipient = team members, feedback sender = team leaders, time of feedback = June), the lateral feedback flow condition (feedback recipient = team members, feedback sender =

other team members, time of feedback = March), and the bottom-up feedback flow condition (feedback recipient = team leaders, feedback sender = team members, time of feedback = March).

Because the conditions are categorical without any rank order, we represented the three conditions using two dummy variables for our analyses (Hayes, 2013). We chose the bottom-up feedback flow condition as the reference group, because it is the only condition where we expected a positive relationship between negative feedback and recipient creativity; in the other two conditions, we expected negative relationships between negative feedback and recipient creativity. By choosing the bottom-up feedback flow condition as the reference group, we were able to investigate differences between the bottom-up feedback flow condition and the top-down feedback flow condition using our first dummy variable (D1), and differences between the bottom-up feedback flow condition and the lateral feedback flow condition using our second dummy variable (D2). Specifically, we followed "indicator" dummy coding (Hayes, 2013); the dummy coding in each condition was as follows: in the bottom-up feedback flow condition, $D1 = 0$ and $D2 = 0$; in the top-down feedback flow condition, $D1 = 1$ and $D2 = 0$; in the lateral feedback flow condition, $D1 = 0$ and $D2 = 1$.

Negative feedback. Participants evaluated the extent to which their quarterly evaluation was negative. To measure negative feedback, we modified the 7-item feedback valence scale developed by George and Zhou (2001). The original scale captures both positive and negative feedback on the same continuum.³ Among the seven items in the original scale, four of them clearly reflect negative feedback and the other three measure positive feedback. We modified the latter three items so that they rated negative feedback. The items are reported in Appendix A.

Positive feedback. Although the primary purposes of our research were to investigate the relationship between negative feedback and creativity

³ The design of the original George and Zhou (2001) feedback scale assumes that negative and positive feedback are on the same continuum. This assumption can be problematic, though, as it is hard to interpret the scale midpoint. The scale midpoint implies two different situations simultaneously: (1) a feedback source providing a high volume of both positive and negative feedback and (2) a feedback source that provides minimal feedback of any type, positive or negative. We discuss the theoretical and methodological aspects of this issue in the General Discussion section.

and to resolve the inconsistency in this relationship, we also measured positive feedback, for three reasons. First, we tested whether employees differentiate negative feedback from positive feedback. We tested this through our confirmatory factor analysis (detailed below). Second, we examined whether the influence of negative feedback is distinctive from that of positive feedback. Lastly, we controlled for it when examining the relationship between negative feedback and creativity. The participants rated the degree to which their quarterly evaluation was positive using another modified version of George and Zhou's (2001) feedback valance scale, with the items rephrased to inquire about positive feedback. We report all the items in Appendix A.

Task processes and meta-processes. We modified existing scales to measure task processes and meta-processes, based on the conceptualizations of both processes delineated in feedback intervention theory (Kluger & DeNisi, 1996). To measure task processes ($\alpha = .93$), we created a 4-item scale by modifying the scales for challenge construal (Elliot & Reis, 2003; McGregor & Elliot, 2002) and primary appraisal (Tomaka, Palacios, Schneider, Colotla, Concha, & Herrald, 1999). To measure meta-processes ($\alpha = .93$), we created a 5-item scale by modifying the scales for threat construal (Elliot & Reis, 2003; McGregor & Elliot, 2002) and secondary appraisal (Tomaka et al., 1999). All the items are reported in Appendix A.

Creativity. Superiors rated the focal employee's creativity using Zhou and George's (2001) 13-item scale of creative performance. Specifically, division heads evaluated the creativity of team leaders in the bottom-up feedback flow condition, team leaders evaluated the creativity of the focal team members in the lateral feedback flow condition, and deputy team leaders evaluated the creativity of focal team members in the top-down feedback flow condition. The reason we collected creativity evaluations from the deputy team leaders in the top-down feedback flow condition, rather than collecting it from the primary team leaders, was to avoid artificially inflated correlations between negative feedback and creativity. In the top-down feedback flow, team members received feedback from their team leader. Collecting creativity ratings from those same team leaders could have introduced same-source biases into the data in this condition. A sample item was "This employee is a good source of creative ideas" ($\alpha = .96$).

Control variables. We controlled for five demographic variables: age, gender, education, tenure with the organization, and tenure with feedback

sender, because there could be individual differences when recipients interpret feedback (Kluger & DeNisi, 1996). Age, tenure with organization, and tenure with feedback sender were measured in years. Gender was measured as a dichotomous variable: "0" for female and "1" for male. Education was coded in the following manner: "1" for a high school graduate, "2" for a graduate from a two-year community college program, "3" for a person with a degree from a four-year university program, and "4" for participant's with a master's degree or PhD. In addition, we controlled for creative role identity ($\alpha = .93$) and creative self-efficacy ($\alpha = .89$). It is possible that recipients who believe that they are creative or efficacious on creativity tasks are more likely to seek ways of improving their creativity (Shalley, Zhou, & Oldham, 2004), and thus they may be more receptive to negative feedback. We also included positive feedback to investigate the unique influences of negative feedback on creativity.⁴

Confirmatory Factor Analysis

We conducted confirmatory factor analysis to examine the psychometric validity of our measures using a variety of indicators of model fit: a chi-square statistic (χ^2), the Tucker–Lewis index (TLI), the standardized root mean squared residual (SRMR), the comparative fit index (CFI), and the root mean squared error of approximation (RMSEA). This analysis included the negative feedback, task processes, meta-processes, and creativity items. Furthermore, we added positive feedback to investigate whether participants differentiated negative feedback from positive feedback. According to the standards recommended by Hu and Bentler (1998), our confirmatory factor analysis indicated a good fit for the five-factor model.⁵ The χ^2 value was 890.794 ($df = 550, p < .001$), TLI was .957, SRMR was .043,

⁴ Note that the results remained the same with or without the control variables.

⁵ Although the chi-square test showed a poor fit, all of other indicators showed good fits. Several scholars have noted that chi-square indices may mislead the interpretation of model fit because it is too sensitive to sample size and the violation of an assumption underlying the test (e.g., multivariate normality of variables). "Hence, using chi-square to test the hypothesis that the population covariance matrix matches the model-implied covariance matrix is too strong to be realistic" (Hu & Bentler, 1998: 425). Given that the other indices, except for those of the chi-square test, were above the traditional cut-off values, we conclude that our five-factor model has a good fit.

CFI was .960, and the RMSEA was .050. The average levels of the standardized loadings on the five constructs were as follows: creativity = .83, negative feedback = .86, meta-processes = .85, task processes = .88, and positive feedback = .90.

In addition, we compared our five-factor model with potential alternative models. The alternative model showing the highest fit was a four-factor model, which combined task processes and meta-processes, $\chi^2_{(554)} = 1549.98$, $p < .001$; TLI = .875; SRMR = .073; CFI = .884; RMSEA = .085. However, a comparison analysis of our original five-factor model and the four-factor alternative model showed that our model has a significantly better fit than the alternative model, $\Delta\chi^2_{(4)} = 659.19$, $p < .001$. These results show strong evidence that our variables were valid, and that employees differentiated all of the important variables from one another. Importantly, employees differently perceived negative and positive feedback according to the confirmatory factor analysis, which suggests that each captures different aspect of feedback.

Results of Study 1

The means, standard deviations, and correlations for all variables in Study 1 are presented in Table 2. To test our hypotheses, we used multiple hierarchical regression, combined with conditional indirect effect analysis—moderated mediation analysis—using the PROCESS macro developed by Hayes (2013).

Hypothesis 1 predicted that, in the bottom-up feedback flow condition, the relationship between negative feedback and recipient creativity would be positive, whereas, in the top-down and lateral feedback flow conditions, the relationship would be negative. The results revealed that the interactions between negative feedback and the two dummy variables were significant. Specifically, Table 3 shows significant interactions between negative feedback and D1 (bottom up = 0, top down = 1; $b = -1.03$, $SE = 0.15$, $t = -6.94$, $p < .001$), and between negative feedback and D2 (bottom up = 0, lateral = 1; $b = -0.97$, $SE = 0.15$, $t = -6.61$, $p < .001$) in predicting creativity. The result of the former interaction indicates that there is a significant slope difference between the bottom-up and top-down feedback flow conditions. The result of the latter interaction indicates that there is a significant slope difference between the bottom-up and the lateral feedback flow conditions. We further investigated these interactions by analyzing the simple slopes at

each value (0 or 1) of each moderator (D1 and D2). The results showed that, in the bottom-up feedback flow condition (from followers to supervisors; D1 = 0 and D2 = 0) the relationship between negative feedback and recipient creativity was significantly positive ($b = 0.48$, $SE = 0.11$, $t = 4.34$, $p < .001$, LLCI = 0.264, ULCI = 0.705). In the top-down feedback flow condition (from supervisors to followers; D1 = 1 and D2 = 0), the relationship was significantly negative ($b = -0.54$, $SE = 0.10$, $t = -5.39$, $p < .001$; LLCI = -0.739, ULCI = -0.343). In the lateral feedback flow condition (from peers to peers; D1 = 0 and D2 = 1) the relationship was significantly negative ($b = -0.49$, $SE = 0.10$, $t = -4.94$, $p < .001$, LLCI = -0.681, ULCI = -0.293). Figure 2 depicts these relationships. Hypothesis 1 was supported.

Hypothesis 2 posited that the moderated relationships between negative feedback, the direction of feedback flow, and recipient creativity would be mediated by task processes and meta-processes. Before testing the moderated mediation hypothesis, we conducted two separate analyses to examine the interaction of negative feedback and the direction of feedback flow in predicting task processes and meta-processes. With regard to task processes, we found significant interactions of negative feedback and D1 ($b = -0.94$, $SE = 0.18$, $t = -5.37$, $p < .001$) and D2 ($b = -1.26$, $SE = 0.18$, $t = -7.22$, $p < .001$). Table 3 summarizes the full results. The simple slope tests showed that the bottom-up negative feedback enabled supervisors to focus on task processes ($b = 0.52$, $SE = 0.13$, $t = 3.89$, $p < .001$, LLCI = 0.255, ULCI = 0.778). However, the top-down negative feedback ($b = -0.43$, $SE = 0.12$, $t = -3.58$, $p < .001$, LLCI = -0.662, ULCI = -0.192) and lateral negative feedback ($b = -0.74$, $SE = 0.12$, $t = -6.36$, $p < .001$, LLCI = -0.975, ULCI = -0.513) significantly decreased employees' focus on task processes. Figure 3 depicts these relationships.

Regarding meta-processes, the interactions that negative feedback had with D1 ($b = 0.36$, $SE = 0.17$, $t = 2.17$, $p = .031$) and D2 ($b = 0.57$, $SE = 0.17$, $t = 3.47$, $p = .001$) were both significant (see Table 3). The simple slope tests revealed that the relationship between negative feedback and meta-processes was not significant in the bottom-up feedback flow condition ($b = 0.07$, $SE = 0.13$, $t = 0.59$, $p = .553$, LLCI = -0.173, ULCI = 0.322), but the relationship was significantly positive in the top-down ($b = 0.43$, $SE = 0.11$, $t = 3.86$, $p < .001$, LLCI = 0.212, ULCI = 0.657) and lateral ($b = 0.65$, $SE = 0.11$, $t = 5.85$, $p < .001$, LLCI = 0.429, ULCI = 0.865) feedback flow conditions. Figure 4 illustrates these relationships.

TABLE 2
Means, Standard Deviations, and Correlations of Variables in Study 1

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 D1 (bottom up = 0; top down = 1)	0.32	0.47													
2 D2 (bottom up = 0; lateral = 1)	0.32	0.47	-.48**												
3 Negative Feedback	3.98	1.09	-.02	-.19**											
4 Task Processes	4.86	1.35	.02	-.18**	-.12 [†]										
5 Meta-Processes	3.35	1.16	.10	.09	.29**	-.44**									
6 Creativity	5.14	1.07	-.12 [†]	-.05	-.17*	.37**	-.46**								
7 Gender	0.54	0.50	-.01	-.04	-.03	.05	-.11	-.01							
8 Age	32.38	4.65	-.41**	-.04	.13 [†]	.03	-.07	.02	.02						
9 Education	3.08	0.51	.05	-.03	-.05	.02	-.08	-.05	.12 [†]	.04					
10 Tenure with Company	6.37	2.69	-.25**	.00	.02	.07	-.08	-.05	.03	.33**	-.04				
11 Tenure with Team	2.15	0.84	-.04	.07	-.02	-.07	.06	.00	-.20**	.08	.03	.04			
12 Creative Role Identity	5.44	1.08	.02	-.14*	.07	.27**	-.10	.16*	.14*	-.01	-.01	-.09	-.14*		
13 Creative Self-efficacy	5.28	1.15	-.04	-.09	.09	.37**	-.18**	.14*	.13*	.00	.03	-.05	-.19**	.71**	
14 Positive Feedback	4.46	1.21	-.04	.09	-.26**	-.10	.05	-.03	-.03	-.02	.04	-.05	.07	.04	.05

Note: n = 225.

[†] p < .10

* p < .05

** p < .01 (all tests two-tailed)

TABLE 3
Multiple Hierarchical Regression on Creativity, Task Processes, and Meta-Processes in Study 1

Variables	Creativity		Task Processes		Meta-Processes	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)			
Gender	-0.09 (0.14)	-0.08 (0.13)	-0.05 (0.17)	-0.09 (0.15)	-0.11 (0.15)	-0.09 (0.15)
Age	-0.01 (0.02)	-0.02 (0.02)	0.00 (0.02)	-0.01 (0.02)	-0.00 (0.02)	0.00 (0.02)
Education	-0.11 (0.14)	-0.10 (0.12)	0.01 (0.16)	0.04 (0.15)	-0.13 (0.14)	-0.14 (0.14)
Tenure with Company	-0.04 (0.03)	-0.02 (0.02)	0.04 (0.03)	0.06 (0.03) [†]	-0.01 (0.03)	-0.02 (0.03)
Tenure with Team	0.04 (0.09)	0.06 (0.08)	0.02 (0.10)	0.02 (0.09)	0.01 (0.09)	0.01 (0.09)
Creative Role Identity	0.10 (0.09)	0.08 (0.08)	0.01 (0.11)	-0.02 (0.10)	0.08 (0.09)	0.10 (0.09)
Creative Self-Efficacy	0.08 (0.09)	0.07 (0.08)	0.44 (0.10)**	0.41 (0.09)**	-0.25 (0.09)**	-0.24 (0.09)**
Positive Feedback	-0.09 (0.06)	-0.03 (0.05)	-0.18 (0.07)*	-0.12 (0.06) [†]	0.14 (0.06)*	0.11 (0.06) [†]
Negative Feedback	-0.24 (0.07)**	0.48 (0.11)**	-0.29 (0.08)**	0.52 (0.13)**	0.42 (0.07)**	0.08 (0.13)
D1 (bottom up = 0; top down = 1)	-0.57 (0.20)**	3.66 (0.63)**	-0.16 (0.23)	3.78 (0.75)**	0.50 (0.20)*	-1.01 (0.71)
D2 (bottom up = 0; lateral = 1)	-0.43 (0.18)*	3.52 (0.61)**	-0.57 (0.21)**	4.49 (0.72)**	0.57 (0.19)**	-1.71 (0.68)*
Negative Feedback × D1		-1.03 (0.15)**		-0.94 (0.18)**		0.36 (0.17)*
Negative Feedback × D2		-0.97 (0.15)**		-1.26 (0.18)**		0.57 (0.17)**
<i>F</i>	2.61**	7.41**	5.52**	10.09**	5.24**	5.58**
ΔF	2.61**	29.96**	5.52**	27.65**	5.24**	6.08**
<i>R</i> ²	.12	.31	.22	.38	.21	.26
ΔR ²	.12	.19	.22	.16	.21	.05

Note: *n* = 225.

[†] *p* < .10

* *p* < .05

** *p* < .01 (all tests two-tailed)

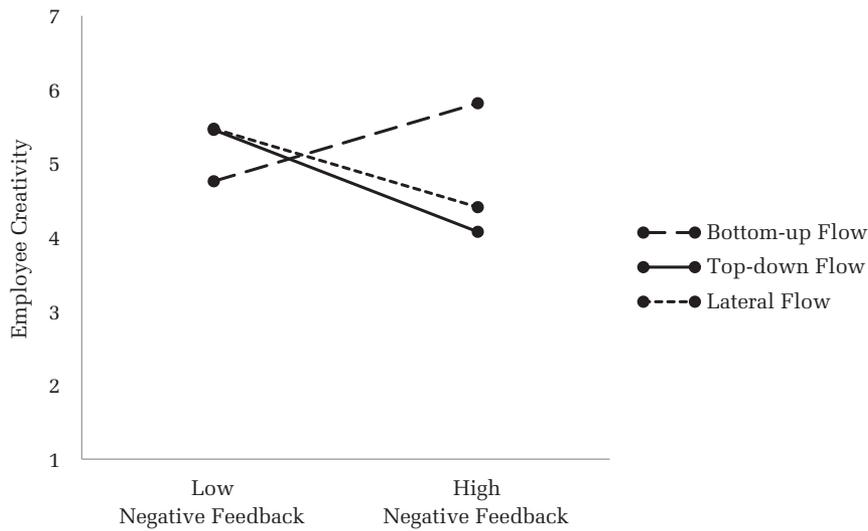
Lastly, we tested the full moderated mediation model using a conditional indirect effect analysis with 10,000 bias-corrected bootstrap resampling (Hayes, 2013). The results showed that, in the bottom-up feedback flow condition, the positive relationship between negative feedback and creativity was mediated by task processes (estimated size of the indirect effect = 0.08, *SE* = 0.04, LLCI = 0.011, ULCI = 0.181), but *not* by meta-processes (estimated size of the indirect effect = -0.03, *SE* = 0.04, LLCI = -0.114, ULCI = 0.046). In the top-down feedback flow condition, the negative relationship between negative feedback and creativity was mediated by both task processes (estimated size of the indirect effect = -0.07, *SE* = 0.04, LLCI = -0.157, ULCI = -0.010) and meta-processes (estimated size of the indirect effect = -0.15, *SE* = 0.08, LLCI = -0.356, ULCI = -0.037). In the lateral feedback flow condition, the negative relationship between negative feedback and creativity was also mediated by both task processes (estimated size of the indirect effect = -0.12, *SE* = 0.06, LLCI = -0.246, ULCI = -0.021) and meta-processes

(estimated size of the indirect effect = -0.23, *SE* = 0.09, LLCI = -0.433, ULCI = -0.082). These results support Hypothesis 2.

Discussion of Study 1

Using a quasi-field experimental design, Study 1 found that the relationship between negative feedback and creativity depends on the direction of feedback flow. Bottom-up feedback flow was the only case in which negative feedback increased recipient creativity; top-down and lateral feedback flows of negative feedback were detrimental to recipient creativity. The two mechanisms—task processes and meta-processes—accounted for these interactional relationships. In the bottom-up feedback flow condition, negative feedback increased creativity because recipients attempted to improve the ways of performing their creativity tasks, and they did not feel threatened by negative feedback. However, in the top-down and lateral feedback flow conditions, recipients failed to generate diverse strategies to perform their creativity tasks. Instead,

FIGURE 2
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Creativity (Study 1)



they felt threatened by negative feedback, which in turn decreased their creativity. Although our primary focus was to investigate the relationship between negative feedback and creativity, we also examined how positive feedback relates to creativity. The result shown in Table 3 reveals that positive feedback had a nonsignificant relationship with creativity ($b = -0.04, SE = 0.06, t = -0.63, p = .528$). We discuss this relationship in the General Discussion.

Although the results of Study 1 supported our hypotheses, some limitations should be noted. First, Study 1 quasi-randomly assigned employees to the three feedback flow conditions using the natural field setting, and we did not manipulate negative feedback. This raises a question of the potential influences that spurious third variables might have on our findings. Second, we measured the recipients' subjective impression of feedback. In the quarterly

FIGURE 3
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Task Processes (Study 1)

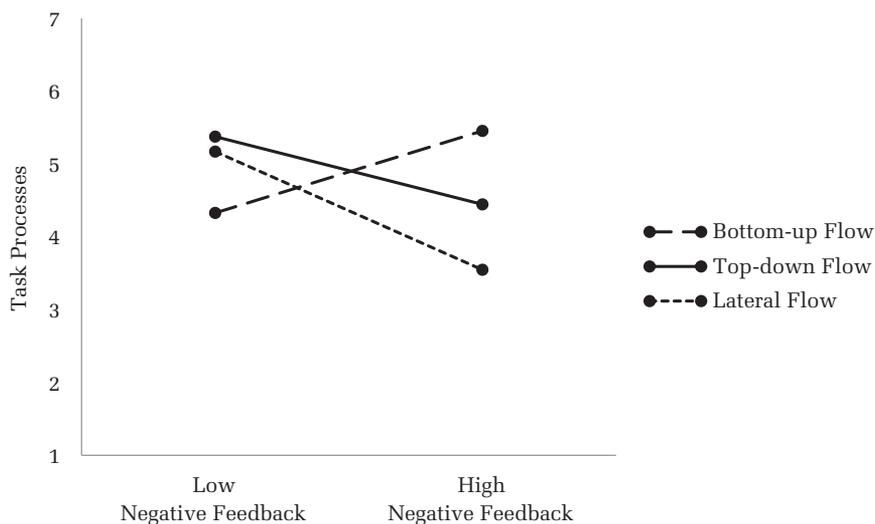
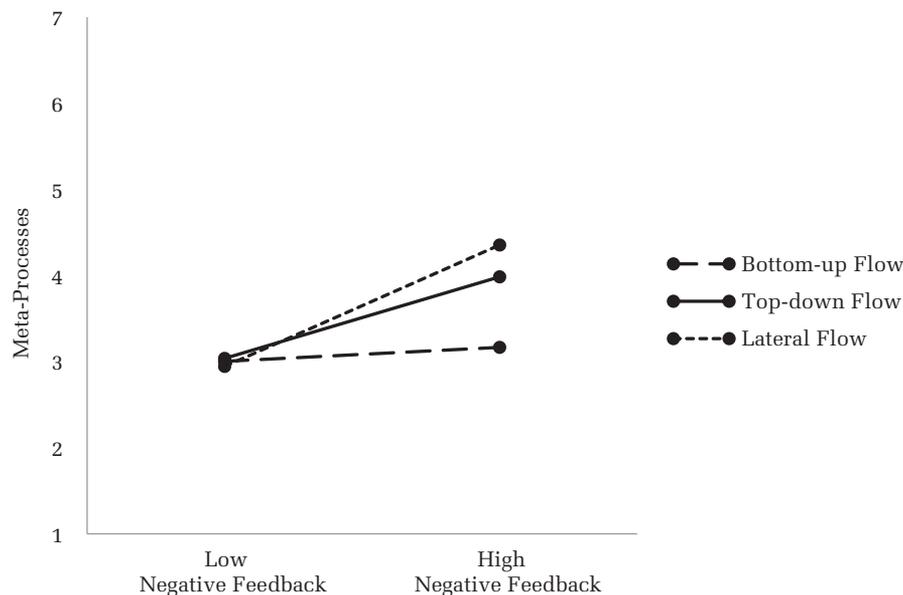


FIGURE 4
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Meta-Processes (Study 1)



performance appraisal, employees received both numerical and written feedback. Rather than using the numerical and written feedback directly, we asked the employees to rate their subjective evaluation of the performance appraisal with an assumption that the same feedback could be perceived differently by employees. For example, two employees who receive 60% in the numerical appraisal may interpret the same number differently; one may interpret it as negative feedback, while another may perceive it as neutral feedback. In addition, methodologically speaking, it was difficult to quantify the negativity of the written feedback objectively. Third, there could be a confounding effect of feedback recipient positions. We collected data from supervisors in the bottom-up feedback flow, but, in the top-down and lateral feedback flows, our data collection was done with team members. Ideally, the data should have been collected from employees at the same position across the three conditions (e.g., middle managers who receive feedback from their followers, supervisors, and peers). This limitation is less likely to hurt the validity of the top-down and bottom-up feedback flows because those two flows presuppose positional differences between feedback givers and recipients. However, there could be an unexpected confounding effect of position in the lateral feedback flow. For example, the underlying psychology of middle managers receiving feedback from

peers could be different from that of team members receiving feedback from peers.

To address these limitations, we conducted Study 2, in which we manipulated both negative feedback and the direction of feedback flow and randomly assigned participants to conditions in a well-controlled laboratory environment. This experiment directly manipulates negative feedback rather than measuring the subjective evaluation of the feedback. Additionally, we manipulate the lateral feedback flow without disclosing the positions of feedback giver and recipient.

STUDY 2: LABORATORY EXPERIMENT

Participants and Procedures

Three hundred and fifty-six undergraduate students at a large North American university (217 males, 136 females, three participants did not report their gender; $M_{\text{Age}} = 19.80$, $SD_{\text{Age}} = 1.51$, four participants did not report their age) participated in this study for one credit point. The sample was 57.02% East Asian, 23.31% Caucasian, 8.99% South Asian, 3.37% African/African Canadian, 0.84% Hispanic, 0.28% Native American/Canadian, and 7.58% Other. Two independent variables (feedback and the direction of feedback flow) were manipulated in this experiment based on a 2 (feedback: negative vs. neutral) by 3 (the direction of feedback flow: bottom

up vs. top down vs. lateral) experimental design. We randomly assigned the participants to one of the six conditions.

Upon arrival, the participants were led to a large room where they completed a short survey regarding their demographic information. After completing the survey, the participants were randomly assigned to one of three roles (i.e., supervisor, follower, or peer) and led to four different rooms. Participants playing the same role were grouped together and shared the same room, except for those playing the peer role. The peers were divided into two groups, and each group used one room. Then, the participants were informed that they would complete a two-round study that would involve exchanging feedback with another participant in a different room through an online platform. Both rounds involved an in-basket task, which is an idea generation task that requires creative solutions (Shalley, 1991). In this task, participants assume the role of an employee in a company and are asked to generate creative ideas regarding 22 organizational issues. We used one of the 22 issues in the first round and three issues in the second round, as explained below. The participants were informed that they would be paired with a partner in a different room. During the first round, the participants individually generated one idea regarding an issue, and then they were paired with another participant. After the pairing, the two parties exchanged feedback regarding the counterpart's idea, including a numerical rating and written feedback in which they could provide additional information to qualify their rating. Subsequently, the participants responded to the measures of task processes and meta-processes. Then, the participants proceeded to the second round. The participants again individually generated ideas regarding three additional issues in the in-basket tasks, which served as our dependent variable, exchanged their ideas, and evaluated each other's ideas. In reality, the participants did not have a real partner, and all feedback provided was prepared by the experimenter, which allowed us to manipulate the negative feedback.

Negative Feedback Manipulation

After the participants completed the first idea-generation task, they sent their idea to their partner and received their partner's answer to the same question. The idea that was supposedly generated by their partner was in fact prepared by the experimenter and was identical for all participants. The participants were asked to offer feedback regarding

the level of creativity of their partner's idea, including a percentile score and written feedback. While the participants completed this task, they believed that their partner also evaluated their idea and provided feedback. After completing their feedback, the participants received their partner's feedback regarding their own work. In reality, this feedback was prepared by the experimenter and included the negative feedback manipulation. The participants received feedback in the same format they had used to provide feedback to their partner: they received a percentile score and additional written feedback. We manipulated the negative feedback using the percentile score. In the negative feedback condition, we informed the participants that their creativity was in the bottom 20th percentile, and, in the neutral feedback condition, the participants were informed that their creativity was average, as they were in the 40th~60th percentile. All participants received the same written feedback, which contained advice regarding generating creative ideas. The advice included useful tips on how to increase cognitive flexibility and cognitive persistence in creativity tasks, which were derived from findings reported in the creativity literature (Nijstad, De Dreu, Rietzschel, & Baas, 2010; Shalley, 1991; see Appendix A). These tips would likely contribute to the generation of creative ideas if the participants were open to using them. To ensure that the manipulation worked as intended, we asked the participants to report how they felt about the feedback they received on a scale from "1" (*extremely negative*) to "7" (*extremely positive*).

Direction of Feedback Flow Manipulation

The "direction of feedback flow" refers to the transfer of feedback from sender(s) to recipient(s) in which the two parties have different or the same organizational ranks. As observed above, the bottom-up and top-down feedback flows are characterized by power asymmetry between the two parties, whereas the lateral feedback flow involves a nonhierarchical and competitive relationship between the two parties who strive to attain limited resources. Reflecting upon these characteristics, we manipulated the direction of feedback flow in two ways: (1) by assigning the participants to the role of supervisor, follower, or peer, and (2) by offering different levels of resource controls (Anderson & Berdahl, 2002; Jordan et al., 2011; Tost, Gino, & Larrick, 2013). The role assignment manipulation has been popular among previous researchers because evidence has

shown that participants primed with a certain role possess the mindset corresponding to the role and behave accordingly (Anderson & Berdahl, 2002; Galinsky, Gruenfeld, & Magee, 2003). The role assignment was performed at the beginning of the experiment by randomly assigning participants to the role of supervisor, follower, or peer. In the bottom-up feedback flow condition, the participants were assigned to the role of supervisor and paired with a follower. In the top-down feedback flow condition, the participants were assigned to the role of follower and paired with a supervisor. In the lateral feedback flow condition, both the participants and partners were assigned to the role of peer without indicating any information regarding the positions of both parties.

To strengthen our manipulation, we also manipulated the different levels of resource controls using a lottery system. This manipulation intended to create the approximate experience of having social power in the real world and a sense of competition to attain a limited resource (e.g., Anderson & Berdahl, 2002; Jordan et al., 2011; Tost et al., 2013). The experimenter provided instructions regarding a lottery as follows: the participants would be entered into a lottery for nine \$100 Amazon gift cards (three per role) at the end of the semester and compete for the lottery only with those who played the same role. In the bottom-up feedback flow condition, we gave the supervisors unique control over the desired reward (i.e., chance of winning the lottery). The participants in this condition learned that their partner's chance of winning the lottery would depend on how they evaluated their partner's creativity in the second round. In other words, by considering the follower's (or partner's) levels of creativity in the idea-generation task, the supervisor (or the participant) could decide how many lottery tickets the follower would receive (from 1 to 10 tickets), and each additional ticket increased the chance of winning the lottery. Furthermore, the participants were informed that their partner's evaluation would not influence their chance of winning the lottery. Instead, at the end of the semester, the researchers would evaluate the creativity of their ideas and determine the number of tickets they would receive. In the top-down feedback flow condition, we provided the same instructions, but, this time, the participant-partner relationship was the opposite, as follows: the participants played the role of follower, and their partner played the role of supervisor. Thus, the partner could determine the number of tickets that the participants would receive, while their evaluation of the

partner's creativity could not influence the partner's chance of winning the lottery. In the lateral feedback flow condition, the instructions stated that the partners were at the same organizational rank, indicating that they were peers. Therefore, the partner's evaluation did not influence the participant's chance of winning the lottery and vice versa. The participants were also informed that, at the end of the semester, the researchers would evaluate their ideas and determine the number of tickets they would receive for the lottery.

To ensure that the participants understood the manipulation of the direction of feedback flow, we employed two types of manipulation checks. First, we asked the participants to report their and their partners' roles. Second, we checked the level of authority and social power each participant felt over their partner by asking the following two questions: (1) "Do you have authority and social power to control your partner's chance of winning the lottery?" and (2) "To what extent do you feel social power over your partner?" The participants responded on a Likert-type scale ranging from "1" (*none*) to "7" (*a lot*). The scores of the two items of the second manipulation check scale were then averaged. Finally, we used the same "indicator" coding scheme as was used in Study 1 to analyze the direction of feedback flow: the bottom-up feedback flow was coded as $D1 = 0$ and $D2 = 0$; the top-down feedback flow was coded as $D1 = 1$ and $D2 = 0$; and the lateral feedback flow was coded as $D1 = 0$ and $D2 = 1$.

Task processes and meta-processes. Task processes ($\alpha = .96$) and meta-processes ($\alpha = .96$) were measured by the same scales that were used in Study 1. The participants rated the two scales between the first and second rounds of their idea generation and evaluation tasks. All items are listed in Appendix A. The participants reported the extent to which they agreed with the items on a 7-point scale ranging from "1" (*not at all*) to "7" (*very much*).

Creativity. The three ideas generated in the second round of the idea generation and evaluation tasks served as our dependent variable: recipient creativity. Two independent judges were trained to evaluate the extent to which the three ideas were creative using a scale ranging from "1" (*not at all creative*) to "7" (*very creative*). The judges showed substantial agreement in the evaluation of the levels of creativity of the ideas: $ICC 1 = .80$ ($p < .001$) and $ICC 2 = .89$, ($p < .001$). Thus, the final creativity scores were obtained by averaging the scores of the two judges on each idea and then averaging the scores of the three ideas.

Results of Study 2

Feedback manipulation check. A 2 (feedback: negative vs. neutral) by 3 (direction of feedback flow: bottom up vs. top down vs. lateral) analysis of variance (ANOVA) with the feedback manipulation check item as the dependent variable showed a significant main effect of the feedback condition. The participants who received negative feedback reported that the feedback they received was more negative ($M = 3.34$, $SD = 1.85$) than those who received the neutral feedback ($M = 4.20$, $SD = 1.38$), $F(1, 350) = 27.71$, $p < .001$, $\eta_p^2 = .07$. Thus, our feedback manipulation was successful.

Direction of feedback flow manipulation check. We checked this manipulation in two ways, as previously described. First, we checked whether the participants accurately identified their and their partners' roles. Three hundred and forty-nine of the 356 participants (98.03%) accurately identified the roles. Second, we conducted a 2 (feedback: negative vs. neutral) by 3 (direction of feedback flow: bottom up vs. top down vs. lateral) ANOVA with the manipulation check scale as the dependent variable. The results showed that the participants in the bottom-up feedback flow condition reported it higher ($M = 6.32$, $SD = 1.21$) than those in the lateral feedback flow condition ($M = 2.01$, $SD = 2.02$) and those in the top-down feedback flow condition ($M = 1.88$, $SD = 1.55$), $F(2, 350) = 298.93$, $p < .001$, $\eta_p^2 = .63$. The participants in the lateral feedback flow condition and top-down feedback flow condition did not differ, $t(231) = 0.54$, $p = .587$. Thus, our manipulation was successful.

Hypothesis testing. The means, standard deviations, and correlations of all variables in Study 2 are presented in Table 4. To test our first hypothesis, we created two dummy variables for the direction of feedback flow, following the same procedure used in Study 1, and performed a regression analysis.

Hypothesis 1 predicted that, in the bottom-up feedback flow condition, the effect of negative feedback on recipient creativity would be positive, whereas, in the top-down and lateral feedback flow conditions, the effect would be negative. The results showed that the interaction between the feedback condition (neutral = 0, negative = 1) and D1 was significant (bottom up = 0, top down = 1; $b = -1.55$, $SE = 0.30$, $t = -5.15$, $p < .001$; see Table 5), as was the interaction between the feedback condition and D2 (bottom up = 0, lateral = 1; $b = -2.08$, $SE = 0.32$, $t = -6.48$, $p < .001$; see Table 5). The former interaction indicates that there is a significant slope difference between the bottom-up and top-down feedback flow conditions; the latter interaction shows a significant slope difference between the bottom-up and lateral feedback flow conditions. Furthermore, we conducted simple slope tests at each value (0 or 1) of each moderator (D1 and D2) and found that negative feedback (vs. neutral feedback) led to higher levels of recipient creativity in the bottom-up feedback flow condition ($M_{\text{Neutral}} = 3.56$, $SD_{\text{Neutral}} = 1.07$; $M_{\text{Negative}} = 4.52$, $SD_{\text{Negative}} = 1.47$; $b = 0.96$, $SE = 0.22$, $t = 4.45$, $p < .001$, LLCI = 0.536, ULCI = 1.385). However, negative feedback led to lower levels of creativity in the top-down feedback flow condition ($M_{\text{Neutral}} = 3.77$, $SD_{\text{Neutral}} = 1.11$; $M_{\text{Negative}} = 3.19$, $SD_{\text{Negative}} = 1.04$; $b = -0.59$, $SE = 0.21$, $t = -2.81$, $p = .005$, LLCI = -0.995, ULCI = -0.176) and lateral feedback flow condition ($M_{\text{Neutral}} = 4.34$, $SD_{\text{Neutral}} = 1.40$; $M_{\text{Negative}} = 3.22$, $SD_{\text{Negative}} = .94$; $b = -1.12$, $SE = 0.24$, $t = -4.71$, $p < .001$, LLCI = -1.589, ULCI = -0.652). These relationships are depicted in Figure 5. Thus, Hypothesis 1 is supported.

Hypothesis 2 stated that the interactional effects between negative feedback and direction of feedback flow on recipient creativity are mediated by task processes and meta-processes. Before we tested the

TABLE 4
Means, Standard Deviations, and Correlations of Variables in Study 2

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 D1 (bottom up = 0; top down = 1)	0.37	0.48					
2 D2 (bottom up = 0; lateral = 1)	0.28	0.45	-.48**				
3 Negative Feedback	0.50	0.50	-.03	-.28			
4 Task Processes	4.88	1.65	-.05	-.11*	-.04		
5 Meta-Processes	3.61	1.82	.03	.02	.16**	-.32**	
6 Creativity	3.79	1.29	-.17**	.01	-.07	.53**	-.43**

Notes: $n = 356$. Negative Feedback (neutral feedback = 0, negative feedback = 1).

* $p < .05$

** $p < .01$ (all tests two-tailed)

TABLE 5
Multiple Hierarchical Regression on Creativity, Task Processes, and Meta-Processes in Study 2

Variables	Creativity		Task Processes		Meta-Processes	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)	<i>b</i> (<i>SE</i>)
Negative Feedback	-0.20 (0.14)	0.96 (0.22)**	-0.17 (0.17)	0.82 (0.29)**	0.60 (0.19)**	-0.04 (0.32)
D1 (bottom up = 0; top down = 1)	-0.60 (0.16)**	0.21 (0.21)	-0.46 (0.21)*	0.29 (0.29)	0.22 (0.23)	-0.25 (0.32)
D2 (bottom up = 0; lateral = 1)	-0.28 (0.17) [†]	0.78 (0.23)**	-0.64 (0.22)**	0.18 (0.30)	0.23 (0.24)	-0.31 (0.34)
Negative Feedback × D1		-1.55 (0.30)**		-1.46 (0.40)**		0.90 (0.45)*
Negative Feedback × D2		-2.08 (0.32)**		-1.61 (0.43)**		1.06 (0.48)*
<i>F</i>	5.31**	13.04**	3.40*	5.82**	3.60*	3.38**
ΔF	5.31**	23.62**	3.40*	9.20**	3.60*	3.00 [†]
<i>R</i> ²	.04	.16	.03	.08	.03	.05
ΔR ²	.04	.11	.03	.05	.03	.02

Notes: *n* = 356. Negative Feedback (0 = neutral feedback; 1 = negative feedback).

- [†] *p* < .10
- * *p* < .05
- ** *p* < .01 (all tests two-tailed)

full moderated mediation model, we tested the interactions between negative feedback and direction of feedback flow in predicting task processes and meta-processes. In predicting task processes, the interactions between the feedback condition and D1 (*b* = -1.46, *SE* = 0.40, *t* = -3.64, *p* < .001) and between the feedback condition and D2 (*b* = -1.61, *SE* = 0.43, *t* = -3.75, *p* < .001) were significant (see Table 5). Specifically, the results of the simple slope tests showed that, in the bottom-up feedback flow

condition, negative feedback led to greater attention to task processes ($M_{Neutral} = 4.79$, $SD_{Neutral} = 1.50$; $M_{Negative} = 5.61$, $SD_{Negative} = 1.46$; *b* = 0.82, *SE* = 0.29, *t* = 2.86, *p* = .005, LLCI = 0.257, ULCI = 1.392). However, negative feedback reduced the participants' attention to task processes in both the top-down feedback flow condition ($M_{Neutral} = 5.08$, $SD_{Neutral} = 1.27$; $M_{Negative} = 4.45$, $SD_{Negative} = 1.71$; *b* = -0.63, *SE* = 0.28, *t* = -2.28, *p* = .023, LLCI = -1.182, ULCI = -0.088) and lateral feedback

FIGURE 5
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Recipient Creativity (Study 2)

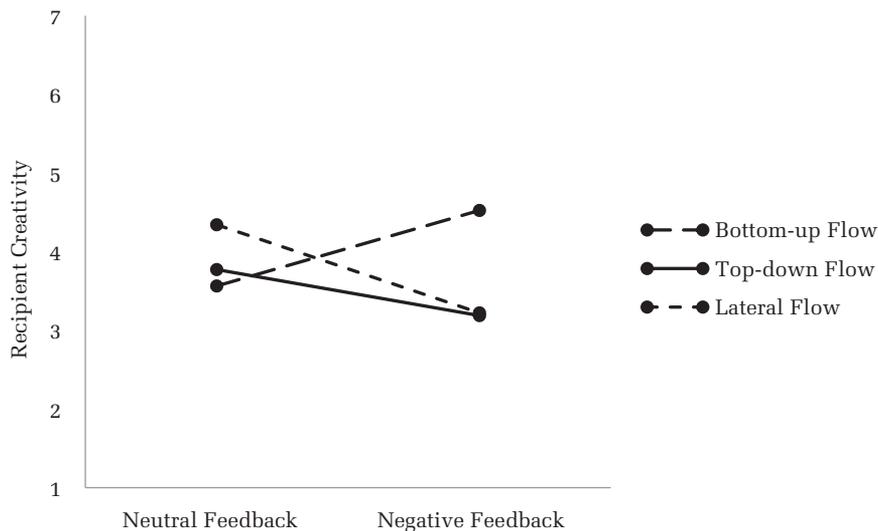
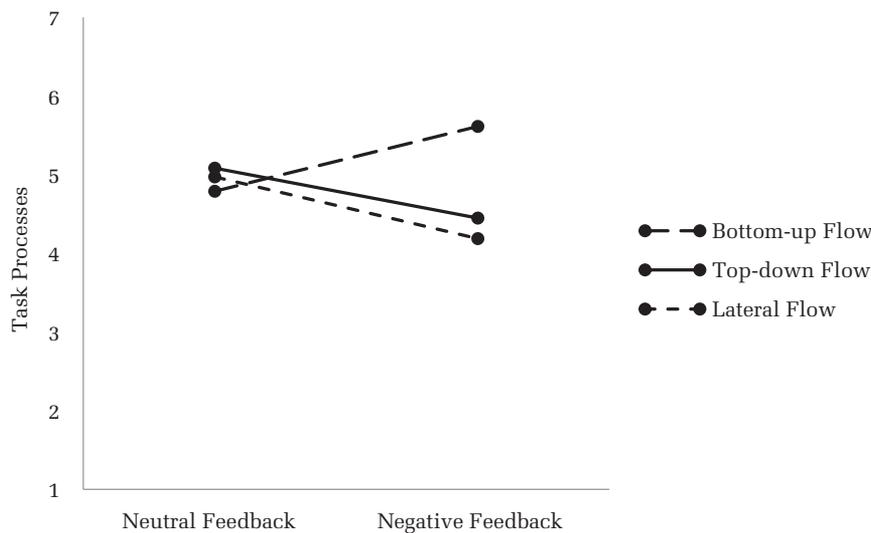


FIGURE 6
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Task Processes (Study 2)



flow condition ($M_{\text{Neutral}} = 4.97$, $SD_{\text{Neutral}} = 1.89$; $M_{\text{Negative}} = 4.19$, $SD_{\text{Negative}} = 1.79$; $b = -0.78$, $SE = 0.32$, $t = -2.47$, $p = .014$, $LLCI = -1.410$, $ULCI = -0.159$). These effects are depicted in Figure 6.

In predicting meta-processes, the interactions between the feedback condition and D1 ($b = 0.90$, $SE = 0.45$, $t = 2.01$, $p = .045$) and between the feedback condition and D2 ($b = 1.06$, $SE = 0.48$, $t = 2.20$, $p = .029$) were significant (see Table 5).⁶ The simple slope tests showed that negative feedback did not influence attention to meta-processes in the bottom-up feedback flow condition ($M_{\text{Neutral}} = 3.50$, $SD_{\text{Neutral}} = 1.61$; $M_{\text{Negative}} = 3.47$, $SD_{\text{Negative}} = 1.53$; $b = -0.04$, $SE = 0.32$, $t = -0.11$, $p = .914$, $LLCI = -0.672$, $ULCI = 0.601$). However, negative feedback directed the participants' attention to meta-processes in the top-down feedback flow condition ($M_{\text{Neutral}} = 3.26$, $SD_{\text{Neutral}} = 1.49$; $M_{\text{Negative}} = 4.12$, $SD_{\text{Negative}} = 1.80$; $b = 0.87$, $SE = 0.31$, $t = 2.79$, $p = .006$, $LLCI = 0.255$, $ULCI = 1.482$) and lateral feedback flow condition ($M_{\text{Neutral}} = 3.19$, $SD_{\text{Neutral}} = 1.77$; $M_{\text{Negative}} = 4.21$, $SD_{\text{Negative}} = 2.56$; $b = 1.02$, $SE = 0.36$, $t = 2.87$, $p = .004$, $LLCI = 0.322$, $ULCI = 1.725$). These effects are depicted in Figure 7.

Finally, to test the full moderated mediation model, we used Hayes's (2013) PROCESS macro

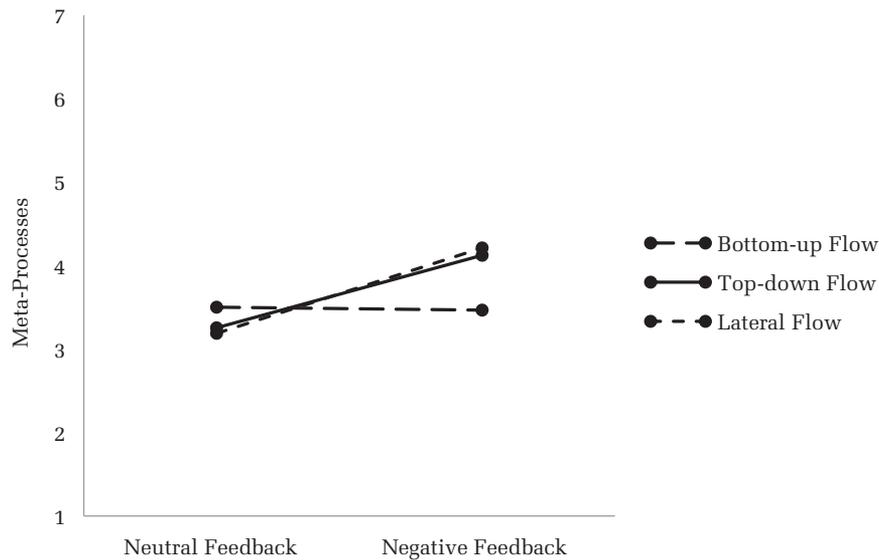
with 10,000 bias-corrected bootstrapping resamples. In the bottom-up feedback flow condition, consistent with the results of Study 1, the positive effect of negative feedback on recipient creativity was mediated by task processes (estimated size of the indirect effect = .28, $SE = 0.10$, $LLCI = 0.093$, $ULCI = 0.484$) but not by meta-processes (estimated size of the indirect effect = 0.01, $SE = 0.06$, $LLCI = -0.104$, $ULCI = 0.128$). In the top-down feedback flow condition, the negative effect of negative feedback on creativity was mediated by both task processes (estimated size of the indirect effect = -0.22 , $SE = 0.10$, $LLCI = -0.421$, $ULCI = -0.039$) and meta-processes (estimated size of the indirect effect = -0.18 , $SE = 0.07$, $LLCI = -0.336$, $ULCI = -0.066$). In the lateral feedback flow condition, the negative effect of negative feedback on creativity was also mediated by both task processes (estimated size of the indirect effect = -0.27 , $SE = 0.13$, $LLCI = -0.545$, $ULCI = -0.026$) and meta-processes (estimated size of the indirect effect = -0.21 , $SE = 0.10$, $LLCI = -0.427$, $ULCI = -0.040$). Thus, the results supported Hypothesis 2.

Discussion of Study 2

In the laboratory experiment, we again found that the direction of feedback flow moderates the relationship between negative feedback and recipient creativity. Specifically, negative feedback increased recipient creativity when the feedback

⁶ In the F test of overall significance, the ΔF of these interactions was marginally significant, $p = .051$ (see Table 5).

FIGURE 7
Regression Slopes for the Interaction of Negative Feedback and the Direction of Feedback Flow on Meta-Processes (Study 2)



flowed upward, but negative feedback reduced recipient creativity when the feedback flowed downward or laterally. We also found support for the hypothesized mediating roles of task processes and meta-processes, replicating the findings from Study 1. Study 2 demonstrates causality by manipulating both negative feedback and the direction of feedback flow and randomly assigning participants into one of the six conditions in a controlled laboratory environment.

GENERAL DISCUSSION

The main objective of our research was to resolve the theoretical and empirical inconsistency in the relationship between negative feedback and recipient creativity. The results of our studies—one quasi-field experiment and one fully randomized laboratory experiment—demonstrate that this inconsistency can be resolved by considering the direction of feedback flow. We found that bottom-up negative feedback (which flows from followers to a supervisor) enabled recipients to utilize the feedback by directing their focus to task processes rather than to meta-processes, and their creativity was enhanced as a result. In contrast, top-down negative feedback (which flows from a supervisor to a follower) and lateral negative feedback (which flows from peers to peers) directed recipients' focus away from task processes and toward meta-processes, which hindered creativity. By

investigating our theoretical model in the field and in the laboratory, we were able to establish both the generalizability and causality of the hypothesized relationships.

Theoretical and Managerial Contributions

Our research contributes to the creativity and feedback literature by integrating contradictory findings regarding the relationship between negative feedback and creativity into a coherent theoretical model. Through our comprehensive review of the literature, we were able to categorize the past findings into two groups based on their theoretical commonalities. The first group (e.g., Fang et al., 2014; Ford & Gioia, 2000; Vuori & Huy, 2015) relied on theories emphasizing the fact that negative feedback identifies the creativity–standard gap, which creates dissatisfaction with current creativity and encourages feedback recipients to close the gap by generating better task strategies for their creativity tasks. The second group (e.g., Van Dijk & Kluger, 2011; Zhou, 1998) argued that negative feedback elicits feelings of insecurity or threat and diverts attention away from creativity tasks, resulting in reduced creativity. By theorizing the two essential mechanisms—task processes and meta-processes—underlying the relationship between negative feedback and recipient creativity (Kluger & DeNisi, 1996), our research provides a comprehensive, parsimonious

theoretical framework that incorporates these two contradictory perspectives.

Our research not only develops a coherent theoretical model for organizing the conflicting findings in the literature but also seeks to resolve the inconsistency by introducing a novel concept: the direction of feedback flow. Past research has examined negative feedback and recipient creativity with little understanding of how the social contexts surrounding this relationship play a role. Zhou (2008: 130) identified the limitation of the extant feedback research as follows:

How effectively we can use feedback in promoting creativity depends on the nature and components of the feedback itself, on the characteristics of the feedback recipient, and on the characteristics of the feedback giver.

Addressing this limitation, our research highlights the importance of conceptualizing feedback as a *flow* that occurs between two (or more) social actors. By investigating feedback flows, we could identify the feedback senders and recipients and examine their social hierarchical relationships, which are all essential for understanding the effect of negative feedback on creativity. Using this novel concept, we were able to investigate the question of how the dynamics of the hierarchical relationship between feedback senders and recipients might resolve the inconsistent association between negative feedback and recipient creativity. We believe that feedback researchers will benefit by considering the direction of feedback flow in their research.

The investigation of the direction of feedback flow also extends feedback intervention theory (Kluger & DeNisi, 1996). To the best of our knowledge, empirical studies directly testing the two psychological processes of feedback intervention theory (i.e., task processes and meta-processes) are lacking in the current literature. Because the key value of this theory is that it proposes two contradictory processes that transmit the opposite effects of negative feedback on employee behavior and outcomes, the lack of empirical tests of the two processes could undermine its usefulness. Our research, conducted in both a professional organization and a laboratory setting, provides empirical evidence supporting the validity of these two psychological processes. By doing so, we help future researchers confidently utilize feedback intervention theory. In addition, our research adds the direction of feedback flow to feedback intervention theory as a critical boundary condition within which the theory operates. Despite its

parsimonious theoretical framework organizing the contradicting influences of negative feedback on organizational outcomes, this theory does not offer insights into boundary conditions in which a recipient responds to negative feedback by attending to either task processes or meta-processes. Given the prevalence of negative feedback in organizations (Zenger & Folkman, 2017) and its potential for both benefiting and hampering employee outcomes, feedback intervention theory can increase its usefulness and value by offering insights about *when* organizations can reap benefits from negative feedback. Our research provides an initial investigation into an important, albeit largely neglected, boundary condition: the direction of feedback flow. We believe that our findings could benefit future researchers who utilize feedback intervention theory by emphasizing the importance of considering the direction of feedback flow in their research.

Our research also emphasizes the theoretical value of separating negative feedback from positive feedback. Some past works have investigated both positive and negative feedback simultaneously and treated the two as opposite ends of a single continuum. However, in real organizations, the assumption that negative and positive feedback are on the same continuum may be problematic. Considering that a job comprises a set of many different tasks in organizations (Morgeson, Garza, & Campion, 2012), a feedback sender may simultaneously provide a feedback recipient with negative feedback on some tasks and positive feedback on other tasks. Even within one task, some behaviors may receive positive feedback, while other behaviors may be the targets of criticism. Therefore, positive and negative feedback can be simultaneously high and low; thus, the single-continuum assumption may not successfully reflect the setting in real organizations. Supporting this, Table 2 shows only a weak negative correlation between the two ($r = -.26, p < .01$). In addition, our confirmatory factor analysis confirmed that these constructs differed. We hope future scholars will build separate theoretical frameworks for negative feedback and positive feedback and measure the two independently.

Our research also has implications for practitioners. First, it is important to emphasize that bottom-up negative feedback creates an opportunity for increasing recipient creativity. In organizations, followers tend to have low motivation to send criticism and negative feedback to their supervisors because such feedback may be considered a challenge against people who have formal authority and social

power over important organizational resources (Brett & Atwater, 2001; DeNisi & Kluger, 2000; London & Beatty, 1993). In contrast to such a notion, our research revealed that supervisors tend to not take negative feedback personally. Instead, supervisors pay heightened attention to addressing the problems indicated by the bottom-up negative feedback in order to improve their behavior. Therefore, organizations should consider instituting formal processes that encourage followers to provide thoughtful, critical feedback to their superiors. We believe that the evaluation system used by the company in Study 1 can encourage bottom-up negative feedback. This company provided formal opportunities (i.e., the quarterly evaluations) for followers to provide negative feedback to their supervisors. Even though the quarterly evaluations were not anonymous and the bottom-up feedback was used only for informative and developmental purposes, the followers actively utilized such formal opportunities to offer negative feedback to their supervisors in both numerical and written forms.

Our research also demonstrated that the top-down and lateral negative feedback flows reduce recipient creativity because they direct recipients' attention to meta-processes and away from task processes. However, this conclusion does not imply that organizations should prohibit supervisors from giving negative feedback to their followers or that peers should avoid giving negative feedback to one another. Instead, supervisors and peers might want to limit the flow of negative feedback in the middle of creativity tasks, as it decreases recipient creativity. Perhaps negative feedback can be offered after creativity tasks have been completed so that the recipients can take time to cope with their threatened mindset and think about the ways in which they can improve their current creativity. This suggestion is in line with the findings in the brainstorming literature that participants should not criticize one another's ideas during group idea generation but should focus only on generating as many diverse ideas as possible (Esser, 1998). Another way of increasing receptivity of feedback recipients in the top-down and lateral feedback flows could be that organizations offer several follow-up sessions to employees. Brett and Atwater (2001: 940) suggested that "executive coaches or multiple follow-up sessions may help those receiving negative or discrepant feedback to deal with negative reactions and work through them." Through multiple follow-up sessions, feedback recipients may have a deeper understanding of their current creativity and evaluation standards,

which could help them to focus more on ways of addressing the creativity–standard gap instead of attending to meta-processes.

Finally, our theory suggests that competition might be the main cause of feedback recipients attending to meta-processes when they receive negative feedback from peers (i.e., lateral feedback flow). Competition is inevitable between peers because social hierarchies in organizations often resemble a pyramid with peers competing for limited resources (Bandura, 1977; Festinger, 1962; O'Keeffe et al., 1984). The sense of competition makes peers negatively react to lateral negative feedback by having them attend to meta-processes. It is then possible that carefully crafted negative feedback that does not remind of competition between peers could enhance peers' receptivity to lateral negative feedback. One possible way to achieve this goal is that peers may need to use temporal feedback instead of using social comparison feedback when they provide negative feedback to other peers. "Temporal feedback" compares past performance with current performance within one employee, whereas "social comparison feedback" compares performance between employees. Feedback researchers have shown that social comparison feedback is the most prevalent type of feedback in organizations, and it increases a sense of competition (Brown, Cron, & Slocum, 1998). Although empirical evidence concerning temporal feedback is lacking in the literature, one group of researchers recently showed that people tend to be more receptive to temporal feedback than social comparison feedback (Chun, Brockner, & De Cremer, 2018) because such feedback can reduce the sense of competition. Thus, organizations, such as the company in Study 1, may need to consider asking employees to use temporal feedback in their quarterly performance appraisal of peers.

Limitations and Future Research

As with any research, the current research has limitations that can be fruitfully addressed by future research. First, national cultures might have influenced our findings. Study 1 was conducted in Korea, where cultures of shame and power distance are salient (House, Hanges, Javidan, Dorfman, & Gupta, 2004). In Korean culture, recipients of negative feedback may feel shameful and believe that feedback senders intended to humiliate them. This cultural background might have made the Korean employees in Study 1 more likely to attend to meta-processes rather than to task processes when they

received negative feedback, particularly in the top-down and lateral feedback flows. In addition, a high power distance might influence supervisors' attention to task processes in the bottom-up feedback flow, because, in a high power-distance culture, both supervisors and followers are unlikely to believe that followers can threaten supervisors. Thus, rather than interpreting negative feedback as a threat to themselves, supervisors might be able to increase their focus on task processes. Nevertheless, we believe that such cultural influences are unlikely because Study 2 replicated the same findings in a North American cultural context. However, the sample of Study 2 was undergraduate students, which lowers the external validity of our findings. Therefore, we call for future research to investigate our model with a sample of employees in other cultural contexts.

Our findings showed that the only feedback flow that benefits recipient creativity is the bottom-up feedback flow. However, it is possible that supervisors may also take bottom-up negative feedback personally and be upset by it when their power is unstable or illegitimate (e.g., new leaders who have recently joined). Research has shown that, when power holders perceive that their power is unstable, they become anxious about others' evaluations, more vigilant to potential threats to their power, and motivated to protect their power (Lammers, Galinsky, Gordijn, & Otten, 2008). Thus, in situations in which supervisors perceive their power as unstable and illegitimate, negative feedback from followers may decrease their creativity because they may feel threatened by negative feedback (meta-processes), and their task focus may be significantly distracted by such feedback (task processes). Thus, future research could explore situations where bottom-up negative feedback hampers supervisor creativity.

Another limitation of our research is that we investigated only the effects of negative feedback. Whether positive feedback positively or negatively influences creativity remains an open question. Our review of past research on positive feedback and creativity revealed inconsistencies in the literature: researchers have found positive (e.g., Hon, Chan, & Lu, 2013; Van Dijk & Kluger, 2011) or null (e.g., Fodor & Carver, 2000) relationships between positive feedback and creativity. This inconsistency could be explained by completely different mechanisms from ours (task processes and meta-processes). For example, positive feedback may either increase or decrease task motivation, which tends to have a positive relationship with creativity. On the one

hand, positive feedback may increase task motivation because such recognition likely encourages recipients to put more effort into their tasks (Amabile, Conti, Coon, Lazenby, & Herron, 1996). On the other hand, as positive feedback highlights the sufficiency of recipients' current behavior, it may provide a sense of satisfaction with their current behavior, which can reduce task motivation (Locke & Latham, 2002). Addressing this inconsistency was beyond the scope of our research. It would be worthwhile for future researchers to shed further light on the relationship between positive feedback and creativity.

The focus of this research was limited to creativity as an outcome of negative feedback. Thus, we did not investigate another important organizational outcome, "routine performance," which refers to employee accomplishment on well-learned and frequently practiced tasks (Kilduff, 1993; March, 1991). Researchers have suggested that routine performance (or exploitation) and creativity (or exploration) are different, independent dimensions of job performance (Cyert & March, 1963; March & Simon, 1958). According to our review, our theoretical model is less likely to be applicable to routine performance. In particular, we believe that task processes in our model could be unrelated or even negatively related to routine performance. By definition, task processes refer to processes whereby employees attempt to generate different, diverse, and novel strategies for their tasks. Such experimentation with task strategies could be detrimental to routine performance because routine performance requires that employees strictly follow existing ways of doing their jobs (i.e., task routine; Cyert & March, 1963; March & Simon, 1958). Therefore, even in the case in which negative feedback increases recipient attention to task processes (e.g., bottom-up feedback flow), we are not certain whether negative feedback is beneficial for routine performance. As the main purpose of our research was to resolve the inconsistency between negative feedback and creativity, the examination of routine performance was beyond our research scope. Thus, we call for future research on this topic.

Finally, our research investigated only *unsought* negative feedback. It is possible that *sought* negative feedback, or negative feedback that follows feedback seeking, may have completely different effects on recipient creativity. Feedback seeking is a type of proactive behavior that often represents the readiness to receive criticism and negative feedback and the willingness to correct behaviors accordingly (Ashford, 1986; Ashford, Blatt, & VandeWalle, 2003;

Ashford & Tsui, 1991). Therefore, negative feedback that follows feedback seeking should be beneficial for constructive changes in task behaviors and creativity; negative feedback indicates the shortcomings of one's creativity, and feedback seekers are ready to admit and correct their shortcomings. We believe this is a promising research area to which future researchers may be able to contribute.

Notwithstanding these limitations, this paper deepens our understanding of the relationship between negative feedback and recipient creativity. By proposing a comprehensive theoretical framework that incorporates inconsistent theories and empirical findings in past research, our research contributes to the creativity and feedback literature. Across two studies, we show that the effects of negative feedback on recipient creativity depend on the direction of feedback flow. We hope to motivate future researchers to explore the differential effects of feedback on creativity by considering top-down, bottom-up, and lateral feedback flows.

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APPENDIX A

Negative (Positive) Feedback

Note: “reference” = supervisor/peers/followers.

- (1) In the performance appraisal, [reference] told me that I didn’t (did) do a good job.
- (2) In the performance appraisal, [reference] criticized (praised) my work.
- (3) In the performance appraisal, [reference] gave me negative (positive) feedback.
- (4) In the performance appraisal, [reference] told me that my performance is not (is) up to the standard.
- (5) In the performance appraisal, [reference] told me that my performance is poor (excellent).
- (6) In the performance appraisal, [reference] indicated that [reference] is not (is) happy with my work.
- (7) In the performance appraisal, [reference] gave me many criticisms (compliments).

Task Processes

- (1) This feedback helped me pay more attention to how I conduct my tasks.
- (2) This feedback helped me think about strategies that I could use to improve my task performance.

- (3) This feedback made me wonder whether there were different approaches I could use to do better on my tasks.
- (4) This feedback made me improve the processes involved in completing my tasks.

Meta-Processes

Note: “reference” = supervisor/peers/followers.

- (1) This feedback made me care about how I present myself to my [reference].
- (2) This feedback made me be more self-conscious about the way I look to my [reference].
- (3) This feedback made me worry about the impression my [reference] has of me.
- (4) This feedback made me think about how my [reference] might perceive me.
- (5) This feedback made me concerned about how my [reference] evaluates my abilities or weaknesses.

Feedback Text Used in Study 2

Note: In this text, grammatical errors were intended.

“I am actually just finishing reading a book about creativity and it gave some good advice. If you want to think ‘outside the box,’ you may want to think about broad categories first, rather than focusing on detailed ideas. For example, on the coffee break topic you may start thinking w ideas related to at least three broad categories (e.g., employees, HR system, or supervisors). Then focus on one category & generate ideas within that category. For example: for the HR system, think about some rules/regulations that prevent the problem. If you cannot come up with creative ideas within the category, you can go on to the next category.

“Another thing they said is that good ideas sometimes combining two or more categories. E.g.: initiate a contest where employees generate ideas about effective HR regulations to solve the problem. This provides an opportunity that employees think about their behaviors as well as HR policy for preventing such behaviors. (This would be related to both employee and HR system categories.)

“The book also talks about the importance of persistence I mentioned that you can jump into other categories when you feel you cannot generate creative ideas within a certain category, please do not give up too easily. Sometimes, you can suddenly come up with good ideas when you put more efforts within the category.”