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A LITTLE GOES A LONG WAY:

ANGER EXPRESSION DURING TECHNOLOGY-MEDIATED PERFORMANCE

FEEDBACK

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Psychology

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ABSTRACT

Emotions have been found to convey information that helps individuals make sense of and manipulate their environment. One example that is relevant to the workplace can be seen in feedback interventions. According to the social functional perspective, emotions expressed by the feedback provider are likely to add to a recipient's understanding of the feedback message. The Emotions as Social Information (EASI) model is consistent with this perspective and states that expressed emotions influence observer behavior through two pathways: performance inferences and affective reactions (e.g. liking of the feedback provider). Recent work with the EASI model suggests that angry feedback can have beneficial effects on performance, and the current study expands these findings by investigating whether technology-mediated communication influences how recipients respond to angry feedback. Drawing on media richness theory, I proposed that angry feedback would be perceived as more intense in richer media and that this would have an indirect effect on individuals' behavior on subsequent task performance through effect of the two EASI pathways. Participants were assigned to one of three computer-mediated angry feedback conditions (i.e., video, audio, text) in response to a divergent thinking task, then were asked to complete a variation of the same task. Media richness in technology-mediated communication modalities was found to act as a catalyst, where richer media increased the perceived intensity of expressed emotions. In general, these differences in perceived intensity of groups manifested in differences across groups for the EASI mechanisms, in that participants in the richer media conditions reported lower performance inferences and less liking of the feedback provider, as well as greater felt anger and anxiety. However, analyses for the indirect effect of intensity of anger on subsequent performance through the EASI pathways were largely unresponsive. Trending results suggest that liking has a non-linear (inverted-U) effect on originality, such that participants who reported moderate levels of liking generated more original responses to the task. Follow-up exploratory analyses were conducted in an attempt to clarify the findings. Results for these analyses, as well as implications for theory and research are discussed.

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A Little Goes a Long Way: Anger Expression during Technology-mediated Performance Feedback

With increased globalization and continued technological growth, organizations are turning more and more to technology-mediated communications (Lim & Teo, 2009). For example, a client or supervisor may need to provide feedback via technology if they are not able to be physically present. As such it is relevant to consider what is the most effective technology-mediated communication for this and other common workplace interactions. It is possible that these technology-mediated interactions may be qualitatively different when the facial expressions are visible (e.g. videoconferencing) compared to only auditory cues (e.g. phone calls), or even less emotive modalities such as e-mail (Daft & Lengel, 1986). In particular, emotions may be perceived as stronger in richer media due to the unequivocal nature of the message facilitated by the additional confirmatory cues. This makes communication modality, and its potential effects on how expressed emotions are interpreted, an important variable to consider in various workplace scenarios but especially in the case of feedback due to the complex nature of such communications (i.e. conveying both affective and performance information).

Feedback is used to impart information about an individual's effectiveness in relation to an established standard (Taylor, Fisher, & Ilgen, 1984). Feedback that indicates that we have not met our goals tells us to work harder or change direction, while feedback that indicates that we are performing well tells us that our current level of effort or performance is sufficient (Carver & Scheier, 1998). Many theories on motivation include feedback as an input factor (e.g. Job Characteristics Theory, goal setting, etc.), though there are mixed views as to which is more motivating: communicating that performance is below standards or communicating that performance is meeting standards (Kluger & DeNisi, 1996).

While some research makes a clear distinction between the success-failure quality of the message content (e.g. failure to meet a goal) and the affective components (i.e. valence), other research presents a decidedly muddier conceptualization. As such, it is important to distinguish the factors that contribute to different conceptualizations of feedback. The success or failure message conveyed by feedback is generally referred to as feedback sign (Kluger & DeNisi, 1996) and has traditionally garnered the majority of the research focus. A distinction should also be made between the message content (i.e. explicit success/failure wording) and delivery (i.e. affective positive or negative quality). Some researchers have differentiated between these two, though this is more the exception than the rule and sometimes focuses more on perceived fairness in delivery rather than affect (Steelman & Rutkowski, 2004). In general, the literature often finds that positive feedback is better received and often leads to improved subsequent performance than negative feedback through increased self-efficacy (Bandura, 1977) and upward goal revision (Ilies & Judge, 2005). However, negative emotions expressed by the feedback provider can communicate that efforts were not sufficient, resulting in increased effort (Sy, Côté, & Saavedra, 2005; Van Kleef, Anastasopoulos, & Nijstad, 2010).

Although the collective literature on the benefits of negative emotions in feedback is growing, further research is needed in order to understand the process through which negative (e.g. angry) feedback is motivating. What is driving the effect? Are people influenced by the evaluative information inherent in the expression (i.e. performance is not meeting standards) or the more automatic affective components (e.g. arousal, liking)? And under what conditions is this likely to occur? One model that has been used to conceptualize these and other questions is the Emotions as Social Information (EASI) Model (Van Kleef, 2009). The EASI Model is a dual process model suggesting that observed emotional expressions have the potential to influence

observer behavior through both affective reactions (e.g. “liking of the expresser”) and inferences (e.g. “relevant information about the situation”). Research using this model as a framework has found that angry feedback can indeed be motivating but that certain moderating variables are likely to play a role (Van Kleef et al., 2010a; Van Kleef, Homan, Beersma, & Van Knippenberg, 2010). Drawing on work by several authors suggesting qualitative differences in technology-mediated communications compared with traditional face-to-face interactions (Daft & Lengel, 1986; Patterson, 1991; Sproull & Kiesler, 1985), the current study introduced communication modality as a potentially influential factor (i.e. audio-visual, audio-only, and text).

The current study contributes to the existing literature in several ways. First, I provide an integration of the EASI model with media richness theory to develop new predictions about how technology may influence the motivating role of anger during performance feedback. Second, I conduct an experimental study that attempts to replicate the mechanisms identified by the EASI model. Finally, the results from the current study have practical implications for feedback providers and organizations, including providing a better understanding of how technology may influence the way that individuals interpret and react to emotional expressions, the impact that these differences may have on observer behaviors (e.g. performance), and recommendations for best practices for providing effective feedback.

Feedback

Feedback is a technique used to convey information about how an individual’s current progress matches a given standard (Taylor et al, 1984) and is intended to be used by the recipient to direct future efforts in order to maximize performance. Hackman and Oldham’s (1976) Job Characteristics Theory (JCT) proposed that work design characteristics, such as feedback, can

influence important behavioral and attitudinal work outcomes (e.g. job performance, job satisfaction, and stress) through knowledge of results. In the original JCT model, the authors conceptualize feedback very specifically as “feedback on the job,” described by Humphrey, Nahrgang, and Morgeson (2007) as “performance information derived directly from the work itself.” One example of “feedback on the job” could be seen in the job of a software developer who writes a computer program that fails to run. The nature of the work is such that the individual employee is provided with the very useful feedback information that the program does not work, likely prompting adjustments until the program can be run successfully. In their recent expansion of JCT to include relevant social and contextual factors, Humphrey et al. (2007) incorporated a new type of feedback, which they refer to as “feedback from others” distinguished from “feedback on the job” by the consideration of the interpersonal component. It is this second type of feedback that is most related to the proposed study. Their analyses found the two types of feedback to be moderately correlated but not redundant (corrected $r = .57$). Additionally, results indicated that feedback from others was positively related to internal work motivation ($r = .31$) and job performance ($r = .28$) and negatively related to stress ($r = -.32$), burnout/exhaustion ($r = -.17$), and turnover intentions ($r = -.34$). In other words, employees receiving more feedback from others at work are more motivated, perform better, and experience fewer negative attitudinal and behavioral outcomes on average.

These results confirm the importance of the feedback process for both individual and organizational success, but it is still important to understand HOW to get from the feedback interaction to these important work outcomes. In particular, in their seminal meta-analysis, Kluger and DeNisi (1996) found that feedback did not always lead to performance

improvements, suggesting the need for a better understanding of the conditions under which feedback may or may not be effective.

Both the original and expanded JCT theories emphasize that feedback is most likely related to performance through the mediating psychological state referred to as knowledge of results – or knowing how you performed. According to the literature on self-efficacy and goal setting, feedback that indicates success (i.e. knowing that you have done well) is more motivating than that which indicates failure (Ilies & Judge, 2005; Locke & Latham, 2002). This is thought to be the result of a desire to see oneself in a positive light (Anseel & Lievens, 2009). The motivating effect of positive feedback was also found within Expectancy Theory (Vroom, 1964) framework in which positive/success feedback was found to increase perceptions of personal competence, increasing effort through the belief that expending such effort will result in the attainment of the goal (Pavett, 1983).

An alternative perspective suggests that negative feedback can be motivating in that it conveys the message that current performance is not adequate (e.g. Podsakoff & Farh, 1989). This logic stems from the ideas of Control Theory (Carver & Scheier, 1998; Lord & Hanges, 1987), which proposes a system of feedback loops through which individuals assess their progress toward some goal according to a set standard (as in goal setting theory). According to Control Theory, unmet goals result in goal-discrepancies that motivate individuals to take action in order to minimize the distance to the goal. Conversely, receiving feedback that a goal has been met should result in decreased effort and a state of contentment.

Thus, negative performance feedback content – indicating failure to reach a goal – can be motivating, but what about delivery (i.e. how the feedback is said)? When feedback providers

have a negative tone, recipients tend to dislike the person (Gaddis, Connelly, & Mumford, 2004) and evaluate them less favorably (Glomb & Hulin, 1997). One study found this to be the case through the interpretation of an individual's negative (i.e. angry) tone as inappropriate or unwarranted (Van Kleef & Côté, 2007). A negative tone has, however, also been shown to provide motivating information.

A recent body of work supports this idea in that negative emotions in feedback (i.e. anger) can lead to positive outcomes in a variety of settings, including negotiations (Van Kleef, De Dreu, & Manstead, 2004), leader feedback in teams (Sy et al., 2005; Van Kleef, Homan, Beersma, Van Knippenberg, & Damen, 2009), and direct individual feedback (Tiedens, 2001; Van Kleef et al., 2010a). These studies suggest that expressed anger provides information that can indeed have positive effects on performance. In an attempt to better understand the role of such emotional information in performance feedback, I turn to Van Kleef's (2009) Emotions as Social Information (EASI) model.

Emotions as Information

EASI Model

The Emotions as Social Information (EASI) model summarizes years of research on the social function of emotional expressions. It recognizes that expressed emotions may motivate actions and influence affective responses in others – essentially, how emotional expressions are informational as in the social-functional perspective. According to the EASI model (Van Kleef, 2009), observed emotional expressions provide people with information about their social environment and have the potential to influence performance via two different pathways: affective reactions or performance inferences. These two pathways may influence perceptions of

the self (e.g. performance inferences and felt emotions), as well as perceptions and appraisals of the expresser (e.g. liking). Before elaborating any further, it is important to address definitional issues from the emotions literature.

Definitions

The term affect actually encompasses a variety of affective terms, including affective dispositions, emotions, and moods (Frijda, 1993). As a result of the related nature of these terms, definitions are sometimes interchanged producing a considerable degree of confusion regarding what these three related but distinct constructs measure. All three involve distinguishing between good and bad feelings, but each should be considered at a different level of analysis (Keltner & Lerner, 2010). Affective dispositions “refer to relatively stable feeling states and response tendencies,” whereas mood and emotions are both characterized as more transient (see Gross, 1998 for review of emotions and related constructs). The distinction between these latter two is that moods typically have no particular cause or target. Emotions, in contrast, can be thought of as temporary affective states with a known cause or target. Though this distinction can become blurred (e.g. over time an emotion may become a mood or vice versa), it is useful for the purpose of social information. Emotions are contextually defined as having a preceding event or target and usually being more intense and shorter in duration than moods (Frijda, 1994). As such, emotions convey specific information, both reflexively (i.e. about ourselves) and externally (i.e. about others or the situation).

Social Functional Perspective

Of course, it is important to distinguish between felt and expressed emotions. Felt emotions originate and exist within an individual, while expressed emotions could be described

as social signals (e.g. facial expressions, vocal tone) shown to others (Ekman, 1993). Both serve to convey specific information, but while felt emotions help us understand ourselves, expressed emotions help us to understand others and our environment in order to respond appropriately to a given situation. This concept is often described as the social functional perspective of emotions (Frijda, 1994). In the social functional perspective, emotions are conceptualized according to the purpose they serve rather than the process through which they are conveyed (Frijda, 1986). For example, similar smiles can be indicative of joy or embarrassment, among other emotions (Saarni, Campos, Camras & Witherington, 2006). According to this perspective, individuals appraise the context of the situation in order to assign meaning (or a label) to a given emotion and these appraisals lead to “action tendencies [Frijda, Kuipers, & Terschure, 1989] ... that impact motivation and behavior” (Grandey, 2008, p. 238). In this way, emotions tell others something about how we feel, and they can convey information about our motives – intentionally or not. Specifically for the purposes of the current study, anger communicates displeasure for circumstances that are attributed to the actions of another, as well as the potential for retaliatory action against the source of their displeasing circumstances (Harmon-Jones & Allen, 1998). As such, anger may motivate the recipient to take action to reduce the negative conditions (e.g. increasing effort) or avoid harm in the future. In addition to motivating action, being the recipient of anger may result in affective reactions, both of which may impact more distal outcomes (i.e. performance). One way that expressed emotions may lead to affective reactions is through what is called primitive emotional contagion.

Emotional Contagion

Emotional contagion, broadly, is a term used to describe how emotions can transfer from one person to another simply through observation. Primitive emotional contagion (Hatfield,

Cacioppo, & Rapson, 1994) occurs when expressed emotions are transferred into the mood of the observer. It is described as a process in which observers mimic others' expressions (interpreted as the physical manifestation of their feelings; Zajonc, 1985) and that this largely unintentional physiological display becomes internalized as felt emotion within the observer (Stepper & Strack, 1993). This process has supported for a variety of emotions, including happiness and sadness (Hess & Blair, 2001). With anger however, the expressed emotions may elicit a complementary, rather than similar, emotional response. In fact, results from a study by Tiedens (2001) showed that, rather than eliciting a similar response (e.g. expressed anger to felt anger), anger led to a more complementary and socially functional response (i.e. expressed anger to felt fear), such that anger was found to be intimidating as it conveyed status or power through perceived competence. A recent study by Giner-Sorolla and Espinosa (2011) supports this idea, as well, with the finding that angry expressions are more likely to elicit feelings of guilt – an emotion that urges someone “to make amends with wronged others” (Leary, 2000). These “anxious” emotions have the potential to motivate the recipient to either avoid the situation (as with fear or intimidation) or work harder (as with guilt).

In line with this logic, a study looking at the impact of leader expressions on subordinate effort showed that anger had a motivating effect, resulting in increased effort on the part of the subordinates (Sy et al., 2005). This may be due to a related finding by Tiedens (2001) that the expression of anger can serve the function of conveying competence and power. That is, observers confer status onto angry individuals, which establishes a power hierarchy and may affect individuals' drive to cater to the expresser. These results are contrary to research indicating that such negative expressions can have deleterious effects with regard to reactions to a leader (Glomb & Hulin, 1997), as well as motivation (Ilgen, Mitchell, & Frederickson, 1981)

and subsequent task performance (Porath & Erez, 2007). Given these inconsistent results from the literature suggesting that both positive and negative expressions have the potential to be beneficial, how should we interpret the effects of angry expressions on observer behavior? Through what processes does anger lead to beneficial versus detrimental effects on performance? Coming full circle, the theoretical perspective that has recently been employed to help shed light on this issue is the EASI model.

EASI Model and Performance Feedback

The EASI model proposes that observer behavior is determined according to which pathway (i.e. performance inferences, affective reactions) is ‘activated’ and that the activation of the respective pathways depends on both situation and person factors, and draws on several more established frameworks to support the model (i.e. social-functional perspective of emotion, primitive emotional contagion). According to the model, the affective reactions pathway operates by influencing our impressions of others (e.g. liking) and potential contagion effects in which we “catch” the emotions of others (Hatfield et al., 1994) as previously described. The mood-as-input model (Martin, Ward, Achee, & Wyer, 1993) would suggest that the affective reactions pathway could also influence performance, such that feedback recipients may catch the feedback provider’s negative emotion through a complementary emotional contagion, which becomes internalized as a negative state that may motivate action to either avoid or mitigate the conditions that are perceived as the cause of the anger (i.e. the recipient’s performance).

Alternatively, expressed emotion can activate the performance inferences pathway, leading individuals to make assumptions about the relative quality of their current performance based on other’s expressions, with anger expressions leading to unfavorable inferences compared

to those without such expressions (Sy et al., 2005; Van Kleef et al., 2009). In this way, emotions can serve to facilitate “knowledge of results” – as discussed in Job Characteristics Theory – which, in the case of anger, informs the participant that performance is not meeting expectations, that he or she is to blame, and thus should do something about it. This may result in greater motivation when anger is expressed than not. Though, it is conceivable that there may be situations in which the anger could be distracting – as when it is seen as inappropriate – resulting in a decreased receptivity for the feedback message (Holt, 1970; Parrott, 2002).

Additionally, the type of performance outcome being considered may make a significant difference. For example, angry expressions may be more likely to be seen as inappropriate in feedback on tasks with right or wrong answers (e.g. memory tasks, puzzles) as the recipient has a much clearer idea of how they performed prior to receiving feedback. More ambiguous situations and tasks – typically associated with creative performance – allow emotional information to play a larger role (hence the idea of ‘emotions as information’). Add that to the fact that creative performance (i.e. the generation of novel and useful outcomes; Amabile, 1988) is becoming an increasingly integral component in evaluating success in modern organizations, and it seems particularly useful to investigate the effects of angry feedback in these types of broad creativity and divergent thinking tasks. Indeed, the most recent research that has been conducted to investigate the effect of angry expressions on performance has focused on just these types of tasks. One factor that has not yet received a great deal of consideration as an important part of the EASI model is the technological method of delivery (i.e. communication modality).

Communication Modality

Most of the empirical evidence regarding factors that moderate the EASI model pathways has focused on individual differences in the motivation to seek information. In his 2009 overview of the EASI model, Van Kleef included a brief treatment of the potential moderating effects of several different variables (e.g. motivation to actively process environmental information, appropriateness of the expressed emotion), and some of his most recent studies testing the model have begun investigating them. Emotional expressions (specifically, anger) have been shown to be more predictive of observer performance when the observer is more motivated to process information, as well as when the observed emotion is seen as appropriate and directed at behaviors rather than persons (Van Kleef, Van Dijk, Steinel, Harinck, & Van Beest, 2008). Another situational factor that may constrain the benefit of angry feedback is communication modality. Specifically, does anger expressed via facial and vocal cues (e.g. videoconferencing) lead to different effects than anger expressed voice-to-voice (e.g. phone calls) or in text form (e.g. e-mails)? This can be explained by Media Richness Theory.

Media Richness Theory (Daft & Lengel, 1986) is a framework presented to classify different modes of communication (e.g. face-to-face, phone calls, e-mail) according to their capacity to accurately and completely convey information. Specifically, when the intended message is more ambiguous or complex, higher levels of media richness are required for effective communication. Richness is defined according to four key components: feedback capability (i.e. immediacy of response), source (i.e. personal or impersonal), communication channels used (e.g. audio, visual, verbal), and language (i.e. nonverbal, verbal, numeric; Vickery, Droge, Stank, Goldsby, & Markland, 2004). For the purposes of comparing computer-mediated face-to-face (cF2F), voice-to-voice (V2V), and text (chat) interactions, there are two characteristics of media richness that vary: communication channel and language. Daft and

Lengel's conceptualization of these two components refers broadly to the types of informational cues that are afforded by a given modality. These two clearly differentiate different levels of media richness. For example, a cF2F interaction is seen as a richer medium than voice-to-voice due to visual and audio cues versus audio-only and some degree of nonverbal feedback language in videoconference that cannot be observed in V2V, and both of these are considered richer than text due to the lack of nonverbal cues. All three can potentially be seen as similar in immediacy and source (Vickery et al., 2004).

Research typically supports the idea that, holding the verbal message constant, media richness is positively related to the effectiveness of communication and potentially, better performance. Rich media led to better understanding and collaboration in dyads and within teams, while less rich media was linked to feelings of solitude and interpersonal uncertainty (Fussell & Benimoff, 1995; Jehng, 1997; Purdy, Nye, & Balakrishnan, 2000; Raghuram, 1996). As such, in the business world, richer media is generally preferred to less rich media and was found to be most crucial when the message to be conveyed is complex and potentially equivocal (Trevino, Webster, & Stein, 2000) – consistent with Media Richness Theory. However, in situations that limit the use of richer interactions (e.g. telework and virtual teams), preference for a particular media may become irrelevant. As such, it is important for organizations to understand the implications of their policies for communication media for important outcomes like employee reactions and future performance. In their original discussion of the theory, Daft and Lengel (1986) emphasized that equivocality of the message content (i.e. the extent to which it is open to multiple interpretations) is key. The less clear the message, the more influential the additional cues provided by richer media. The ideas proposed by Media Richness theory support the notion that communication modality may play a significant role in understanding when anger

expressions are motivating, due to the increased perceived intensity resulting from added emotional cues (e.g. vocal tone, facial expressions). The question, then, is how exactly do different communication modalities affect such outcomes? One way to study this question is to conduct studies that directly compare how anger is communicating feedback across different modalities.

A few studies have compared the stress level of recipients of negative expressions in different communication modalities, but little evidence has been found to support a differential effect (Jones, Diamond, Baytalskaya, & Grandey, 2007). In a call center simulation, Wegge, Vogt, and Wecking (2007) found no main effect for modality (V2V, cF2F) on job stress, and interacting with an angry customer was just as stressful in V2V as videoconferencing. One possible explanation for a lack of differences by modality in the previous study is suggested by the nature of the sample. The call center employees that participated in the study were experienced customer service representatives who had been provided with a script. Having a script to reference has been shown decrease anxiety in service workers (Avery, Richeson, Hebl, & Ambady, 2009). Perhaps working from a script decreased the ambiguity of the situation and increased the representatives' perceived control over the situation.

Other studies have focused on the differential impact of various modalities on accuracy and errors – typically within the area of virtual teams. Results in this area suggest that richer media facilitate collaboration and understanding (Fussell & Benimoff, 1995; Jehng, 1997), as well as relational performance factors (Vickery et al, 2004) leading to more effective performance. Evidence from these studies and others suggests that richer media may result in less ambiguous or clearer messages, which may improve performance. However, the team context may not translate similarly to the individual feedback context.

One commonality across the literature, however, is a lack of consideration of the role of emotional cues in performance. The different level of cues (and consequently varying intensity) afforded by a given communication modality is one of the defining features of media richness, but little attention has been paid to the role of emotions specifically. Drawing on the EASI model by Van Kleef and colleagues, the current study seeks to assess the effects of expressed anger on observer behavior across unique communication modalities. In particular, I seek to investigate whether modality constrains the communication of expressed emotion and thus, the intensity and clarity of the emotional information inherent in the expression.

Current Study

In addition to explicit evaluative information, feedback often contains more implicit information in the form of emotional expressions, which have the potential to play a significant role in the feedback effectiveness. These expressions provide information that can impact inferences made about one's performance, as well as affective reactions to the feedback and feedback provider. Further, the modality through which feedback is delivered may impact how emotional information present in observed expressions is interpreted, as well as whether recipients are motivated and able to perform subsequent tasks. The current study attempts to investigate these relationships using the dual-pathway EASI model as a guiding framework (see Figure 1 for a graphical illustration).

Insert Figure 1 about here

Performance Inferences

According to the EASI model, anger may be interpreted as evaluative in nature. That is, anger tells the observer something about the adequacy of his or her current level of performance (i.e. performance inferences). Anger is thought to stem from feelings that an individual's goals are being inhibited and that someone else is to blame (Smith, Haynes, Lazarus, & Pope, 1993). Thus, when individuals identify another's expressions as indicative of anger, they can infer that individual's feelings. If the observer perceives himself to be the target of the expressed anger, he may further infer that he is being blamed for the other's discontent (e.g. low levels of performance, low quality output). Expressed anger from a leader elicits increased effort, compared to positive expressed emotions (Sy et al., 2005), and lower perceptions of performance among subordinate team members, compared to neutral leader displays (Van Kleef et al., 2009). On an individual level, negative displays from a higher power individual have been associated with increased performance in observers who were highly motivated (Van Kleef et al., 2010a). Further, in richer media, the explicit verbal content is less equivocal allowing for a more accurate understanding of the intended message (Fussell & Benimoff, 1995; Jehng, 1997). Accordingly, holding the explicit feedback message content constant and ambiguous, angry expressions should convey that the observer's current level of performance is not sufficient, and this effect should be stronger as a result of the intensity of the emotion expressed, which is likely to be perceived differently due to additional cues (e.g. vocal tone, facial expressions).

Hypothesis 1: Participants in the audio-visual (cF2F) angry feedback condition will report lower performance inferences than those in the audio-only (V2V) angry feedback condition, and both will report lower performance inferences than those in the control (text) condition.

Affective Reactions

In addition to providing observers with self-relevant performance information, emotional expressions can influence evaluations of the feedback provider (e.g. liking) and recipient feelings through “caught” emotions or emotional contagion – conceptualized jointly as affective reactions (Van Kleef et al, 2009). The emotional component of the feedback message is likely less ambiguous and more salient to the recipient due to additional, clarifying cues (e.g. vocal tone, facial expressions). Thus, the effects of the expressed anger on affective reactions should be stronger (i.e. more intense) in richer media conditions.

Research and theory suggest that, when perceived as inappropriate or unjust, expressed anger is associated with lower levels of liking for the expresser (Geddes & Callister, 2007; Glomb & Hulin, 1997; Van Kleef et al., 2010b), and the presence of additional facial cues may serve to increase the perceived intensity of this emotional component of the feedback. This has the potential to direct the recipient’s attention away from the task and toward the feedback provider (Kluger & DeNisi, 1996). This shift in focus may stem from perceiving the anger as an inappropriate or unfair response if seen as unjustified (Glomb & Hulin, 1997), and this is more likely to be the case if the emotions are perceived as more intense. Such perceptions of fairness have been positively linked to reactions to the feedback provider (Leung, Su, & Morris, 2001). Additionally, the increased salience of emotions in richer media (due to additional cues) provide clearer, more prototypical instances of expressed emotions (Frank, Ekman, & Friesen, 1993), potentially providing greater opportunity for primitive emotional contagion to take place (i.e. anger). Emotional contagion has also been shown to result in feelings that are complementary (e.g. observed anger leading to fear or intimidation; Giner-Sorolla & Espinosa, 2011; Tiedens, 2001). As such, I propose that participants in the conditions with more intense anger (i.e. richer

conditions) will report higher levels of both anxiety and anger than those in conditions with less intense anger.

Hypothesis 2: Participants in the audio-visual (cF2F) condition will report greater a) dislike for the feedback provider, b) felt anxiety, and c) felt anger than those in the audio-only (V2V) condition, and both will report more of each of these affective reactions than those in the control (text) condition.

Subsequent Task Performance

Competing evidence suggests that there are certain conditions under which both positive and negative felt mood can positively impact creative performance (Isen, Daubman, & Nowicki, 1987; Martin et al, 1993), with the presence of rewards and clarity of one's feelings moderating the relationship (George & Zhou, 2002). However, decidedly less consideration has been given to the impact of observed expressions, rendering the story incomplete. One study that has considered the role of observed expressions investigated the effect of angry emotional expressions (compared to neutral) during feedback on subsequent creative performance (specifically on a divergent thinking task; Van Kleef et al, 2010a). Results showed that angry video feedback was more beneficial than affectively neutral feedback for individuals who were high in epistemic motivation (EM; need to accurately understand their environment) and this effect was reversed for those low in EM. These results support the notion that angry feedback can have a positive impact on future performance, but they also indicate the need to consider potentially relevant situational factors.

Following the theoretical reasoning behind the EASI model, expressed emotions (e.g. anger) convey information above and beyond the more explicit verbal information that may be

present in a given situation. This information has been shown to affect observer behavior through self-evaluations (i.e. performance inferences) and affective reactions (i.e. liking of the expresser, felt emotions). These two pathways are the mechanisms through which observed expressions are thought to eventually impact observer behavior (e.g. subsequent performance). Using this framework, angry expressions have had a motivating effect on performance under certain conditions (Van Kleef et al., 2010a, 2010b). A significant collection of contrary results in the literature suggests that we still may not have a complete understanding of this relationship.

While these and other studies have focused on comparing the effects of anger versus other emotions (e.g. happiness, neutrality), there is evidence from the literature to suggest the importance of also considering effects across levels (i.e. intensities) of an emotion. Incorporating ideas from Media Richness Theory (i.e. increased clarity of the message associated with more salient nonverbal cues), more intense anger may provide information that can be used to improve performance, but it may also lead to more negative affective reactions from the observer as a result of the anger coming across as inappropriate or unfair, and such negative reactions have traditionally been shown to impede performance. In other words, if the question is whether the intensity of expressed emotions influences the accuracy with which the message (conveyed by the emotions) is understood, it would follow that more intense (anger) is better. However, if intensity influences perceptions of appropriateness or fairness, it is logical to suggest that moderate amounts are better (i.e. providing motivating benefits without being excessive).

Recall that the EASI model is essentially a dual process mediation model that proposes effects of expressed emotions on observer behavior through two possible pathways: performance inferences and affective reactions (i.e. liking of the feedback provider and felt emotions). In his original proposition of the EASI model, Van Kleef (2009) described the two different pathways

(i.e. inferences, affective reactions) as having the potential to be differentially activated, noting that they were likely not mutually exclusive. That is, rather than suggesting an either-or relationship where only one path can be activated in a given situation, he acknowledged that both can be activated simultaneously and that the extent to which each was activated is what matters. Theoretically, this suggests that the effect of the pathways on observer behavior is complex.

The current study proposes linear effects for the effect of the expressed intensity of anger (due to media richness) on the separate EASI mechanisms, but also a curvilinear effect of expressed anger intensity on performance (e.g., moderate amounts are best) because it is expected that moderate levels of performance inferences and felt negative emotions are most motivating. Specifically, when an individual perceives that their performance has been reviewed very favorably, he or she may not be motivated to put in additional effort, but if an individual feels that their performance has been reviewed very unfavorably, he or she may feel that they are unlikely to achieve the desired standard, also resulting in no additional expended effort on a subsequent task (Donovan & Williams, 2003). Similarly, felt negative emotions such as anger and anxiety may be more energizing than no emotions, but too much of these are distracting from the task at hand (Kanfer & Ackerman, 1989). Accordingly, I am proposing a nonlinear effect of expressed anger intensity on subsequent performance, which is expected to be indirect via nonlinear effects of the EASI mechanisms on creative performance.

Hypothesis 3a: There will be a nonlinear (inverted-U shaped) effect of intensity of anger expressions (modality conditions) on task performance following feedback.

Hypothesis 3b: The effect of anger intensity on performance will be indirect through nonlinear effects of the EASI mechanisms (i.e. performance inferences, affective reactions) on performance outcomes.

Exploratory Mediators

The EASI model focuses on two types of pathways: perception of one's own performance and one's own emotions. As an extension of the EASI model tested by Van Kleef and colleagues, findings from the feedback literature suggest two mechanisms worth considering.

Competence of feedback provider. The EASI model focuses on how expressions make one judge one's own performance. However, when the leader expresses emotion, people judge the leader's performance as well, and this may affect motivation. Fleenor (1988) found that recipients are more accepting of feedback when the feedback provider is perceived as a credible source (i.e. competent to be providing them with feedback). Expressions of anger have been associated with the conferral of status to the expresser (Tiedens, 2001), and perceived status has been shown to predict perceived competence (Fiske, Cuddy, Glick, & Xu, 2002). This is not a uniform finding, however, as evidenced in a study by Glomb and Hulin (1997), which found that anger expressed during feedback led to lower ratings for supervisors. As such, it is worth investigating the influence that anger may have on perceived *competence* and the role the competence may play in the expressed emotion to performance relationship.

Feedback content accuracy. Given that emotions can distract from the task, it could be that anger expressions that are more intense reduce individuals' ability to *recall* the content of the feedback message (i.e. suggested strategies for improvement), reducing subsequent performance. In their influential meta-analysis, Kluger and DeNisi (1996) found that feedback

interventions were more likely to positively impact future performance when focused on the task, as opposed to the individual. The feedback in the current study consisted exclusively of suggestions for ways to generate more creative responses (i.e. the task). It is possible that the extent to which participants are able to recall specific, actionable strategies provided in the feedback message may impact whether or not they are able to utilize these strategies, potentially impacting subsequent task performance.

Summary

The literature on media richness has yet to provide a clear understanding of the comparative costs and benefits of different communication media. However, research on the sweeping topic of emotions provides evidence suggesting that emotional cues present in richer media have the potential to play a significant role. In particular, the presence or absence of emotional cues may affect an individual's appraisal of the feedback interaction (and their subsequent effort and performance) through the two pathways described by the EASI model (i.e. performance inferences and affective reactions), such that emotions observed in richer media will have a greater impact. As such, the current study sought to investigate this effect to determine if the benefits derived for highly motivated individuals from angry expressions in feedback situations hold across different communication modalities (i.e. levels of intensity). In order to develop a more complete understanding of the phenomenon, the current study also sought to test how several other relevant factors (e.g. feedback recall) may be affected by the observed anger across modalities. Taken together, results should provide more clarity regarding best practices for the most effective way to provide negative (i.e., angry) feedback.

Method

Participants and Procedure

Participants were recruited from two sources: the undergraduate subject pool and undergraduate Psychology classes at a major public university in the northeastern U.S. (N=136). Participants from the subject pool signed up for available study sessions through the University approved recruiting system, and participants recruited from undergraduate classes signed up for available times through the study administrator. All participants were granted extra credit or course credit for their participation or completion of an equivalent alternate assignment. The sample was 60.3% female and 79.4% of participants identified as Caucasian. The average age of the sample was 19.96 years ($SD = 1.60$), and 44.9% of the sample identified as freshmen. The current study had two experimental conditions (audio-only, N = 46; audio-visual, N = 47) and a control condition (text, N = 43).

Participants signed up for time slots in class or via email, with up to two participants per one hour session. Upon arrival, the participants were told that the study was investigating feedback and creative performance in situations where the feedback provider cannot be present in-person, and were asked to sign the informed consent form to indicate their willingness to participate. Following the consent form, participants began a demographics questionnaire (Survey 1) inquiring about such variables as gender, age, race/ethnicity, class rank, and trait epistemic motivation. At this point the administrator randomly assigned the participants to one of three experimental conditions based on communication modality (i.e. cF2F, V2V, and e-mail) and directed them to a computer terminal to begin their participation in the session. The study administrator informed the participant(s) that he or she would be asked to complete tasks that have been shown to reliably assess creativity and then receive feedback on the responses from a creativity expert. The rest of the process was guided by materials and instructions contained in

four folders on the desk, which minimized involvement from the administrator; however, she stayed in the room in case there were questions.

In the first folder, all participants were provided with the same 1-page biographical sheet highlighting the credentials of the feedback provider, as well as the potential benefit of receiving feedback on their creative performance (see Appendix B). This description was intended as both an overview for the participant and as a manipulation of state epistemic motivation. This method of manipulation has been shown to increase both process and outcome variability to the extent that participants will be actively engaged in the task and invested in their results (Van der Schalk, Beersma, Van Kleef, & De Dreu, 2010). A picture of the “feedback provider” with a neutral expression was included on the biographical sheet in order to hold constant information about his appearance across conditions.

Participants were seated away from each other, put on headphones, and then followed the written instructions following the bio in the first folder. Directly following the feedback provider bio were instructions for Task 1 (a divergent thinking task), which was completed on the computer and then ostensibly sent to the feedback provider. After a brief wait, during which they completed their demographic questionnaire, they received the manipulation: a feedback message (i.e. e-mail, audio clip, or video clip). They were then guided to open the second folder that provided instructions to complete a survey about their reactions to the feedback and then to open the third folder, which contained instructions for Task 2 (a variation of Task 1). After completing Task 2, participants were instructed to open the final folder containing one final survey. Upon reaching the end of the materials, participants notified the administrator and were debriefed regarding deceptive aspects of the study as described below.

Task 1. Participants were told that they were getting the opportunity to complete a creativity task. Participants were instructed to generate as many uses as they could for a potato – a variation of the Guilford (1967) “brick task” as used by Van Kleef et al (2010a) to identify levels of divergent thinking. Following the protocol used by Van Kleef et al. (2010a), participants were given 8 minute to complete the task.

Manipulation. After completing Task 1, participants were instructed to send their responses to the feedback provider using a program called “PsychMail”. In actuality, this was a Java-coded user interface designed specifically for the current study, which was not connected to the internet or any other system but was portrayed as a functional e-mail client. To enhance realism, participants were instructed to fill in “To,” “From,” and “Subject” information on the outgoing message with their task responses. Participants then waited to receive feedback. Participants had received instructions prior to beginning the study that they could work on the demographics survey during this waiting time (approximately 3.5 minutes). After the waiting period (designed to give the impression that the feedback provider was viewing their responses and composing a feedback message), participants experienced one of three feedback conditions (i.e. cF2F, V2V, e-mail). The content of the message was intentionally vague (see the Appendix for the script) – essentially a listing of Osborn’s brainstorming rules (1953), following the same script as Van Kleef et al., 2010a. As such, the feedback provider provided consistently ambiguous verbal feedback, but the nonverbal content (i.e. intensity of anger) varied. After the message ended, participants were instructed to complete a survey based on the feedback they had just received. Then, they moved on to Task 2.

Task 2. Participants were instructed to generate as many uses as they could for a brick – the original Guilford (1967) creativity task. They were given 8 minutes to complete the task just

as in Task 1. Participants were again instructed to submit their responses to the feedback provider using the “PsychMail” program. After sending their responses from Task 2, participants completed a final survey including manipulation check items. Following completion of this final survey, participants were appropriately debriefed.

Stimulus Development

Using the angry video clip developed in Dutch by Van Kleef et al. (2010a) as a guide, a script was written and a “feedback provider” (comparable in appearance to the original actor) was recruited to recreate the video in English for the current study. As directed by Van Kleef (personal communication, 2010), the script was composed of Osborne’s brainstorming rules (see Appendix for full script). Based on preliminary pilot results from an undergraduate psychology student sample ($N=14$), the best (i.e. both angry and realistic) of several angry video (audio-visual) clips was chosen. An equivalent audio-only clip was created by stripping the video from the existing audio-visual clip. This ensured that differences between the two clips could only be attributed to the different amounts of cues available in the respective communication modalities (i.e. vocal tone only in audio-only, vocal tone and facial expressions in audio-visual).

Additional data were collected to evaluate the proposed audio and video clips on whether or not the expressed emotion was perceived differently across the communication modality conditions. Participants in the first sample ($N=25$) were all freshman undergraduate students, and they indicated that the video clip ($M = 3.33$, $SD = 1.291$) was seen as significantly angrier than the audio clip ($M = 2.10$, $SD = .876$, $p < .001$). Then a text version was created, using the script to generate the text and underlining or italicizing words that were vocally emphasized in the audio and visual conditions. A second sample ($N = 46$) ranged in demographics from

undergraduate students to working adults; 58.7% female and 73.9% Caucasian. Results from a one-way ANOVA showed significant differences for anger across the three conditions, with more intense anger perceived in cF2F ($M = 4.44$, $SD = .365$, 95% CI: 3.709-5.180) than V2V ($M = 3.33$, $SD = .400$, 95% CI: 2.527-4.139) and text adequately serving as a control condition with little anger perceived ($M = 1.46$, $SD = .429$, 95% CI: .596-2.327; $F(2, 45) = 14.06$, $p < .05$). The extent to which positive emotions (i.e. happy, proud, enthusiastic) and anxious emotions (e.g. afraid, guilty, nervous, distressed, embarrassed) were displayed was not perceived differently across conditions ($p > .05$ for all). As a set, this provided evidence that the clips were manipulating the intensity of anger expressions by changing the media richness, while holding constant the message and other emotional expressions (e.g., anxiety, happiness) across conditions.

Measures

Task performance. Following van Kleef et al. (2010a), performance on a divergent thinking task was evaluated according to fluency (i.e. thinking of many diverse ideas quickly), originality (i.e. uniqueness of ideas compared to those reported by other subjects), and flexibility (i.e. the variety of different types of uses generated by an individual; Guilford, 1967; Sternberg & Lubart, 1999; Torrance, 1966). Fluency was operationalized as the total number of uses generated. Flexibility was operationalized by assigning each use generated to a category (from a list created by Van Kleef et al., 2010a) as counting the number of different categories.

Originality was operationalized according to the uniqueness of each response with respect to the frequency with which it appeared across the sample from the current study (Zenasni & Lubart, 2008). Specifically, uses were awarded one point if generated by less than 5% and two points if generated by less than 1% of participants ($N = 136$). Uses generated by more than 5% of all

participants were not awarded any points for creativity. A sum originality score was calculated by summing all points awarded to each participant. A final score was then derived by dividing the participant's total score by their fluency score in order to eliminate the confound created by the increased opportunity for original answers inherent in an increased number of ideas generated (fluency).

Three independent trained raters – blind to participant conditions – independently rated an initial subset of these responses (N=50) for fluency and flexibility to ensure reliability. Interrater reliabilities were calculated using intra-class correlations (ICCs), which are intended to derive the reliability of ratings across two or more raters. A two-way mixed model was specified, indicating the raters as fixed effects and the target variables (i.e. fluency, flexibility) as random factors. ICCs from the initial subset were all above .965; specifically, $ICC(3,3)_{Fluency_Task1} = 1.000$, $ICC(3,3)_{Fluency_Task2} = .999$, $ICC(3,3)_{Flexibility_Task1} = .997$, $ICC(3,3)_{Flexibility_Task2} = .966$. Due to the high level of reliability, the remaining sample was split across the raters (i.e. each rater coded approximately 30 additional responses).

EASI model mechanisms. In order to assess the mechanisms of the EASI model (i.e. inferential processes, affective reactions), I used a modified version of the “posttask questionnaire” (PQ) created by Van Kleef et al. (2009). I used the exact items to measure performance inferences (e.g. “I feel that the feedback provider was satisfied with my performance”) and liking (e.g. “The feedback provider made a positive impression on me”) but replaced more general feeling items (e.g. “The feedback provider made me feel bad”) with more specific emotion terms. Participants were asked to indicate the extent to which they agreed with each item from the performance inferences and liking sections on a 5-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). To assess felt emotion, participants reported the

extent to which various discrete emotions accurately described their current feelings on a 1 (very slightly or not at all) to 7 (extremely) scale (based on items from Gasper & Clore, 2000). The full set of items can be found in the Appendix. Appropriate factor scores for these three scales were created by taking the average score on those items comprising a given factor.

In order to group the mechanism items appropriately for further analyses, I ran a principal components analysis with varimax rotation on all of the items mentioned above (i.e. performance inferences, liking, discrete emotion). Two emotions (i.e. embarrassed, bored) were dropped from the model due to heavy crossloading or weak primary loading, but there were five distinct factors explaining 64.65% of the overall variance, with the item loadings for the rotated solution suggesting that those five factors represented performance inferences ($\alpha = .76$), liking ($\alpha = .88$), anxious emotions (i.e. afraid, guilty, nervous; $\alpha = .78$), angry emotions (i.e. angry, contemptuous, disappointed, disgusted, distressed, irritated, unhappy; $\alpha = .89$), and positive emotions (i.e. enthusiastic, happy, proud; $\alpha = .77$). All items retained have distinct loadings of .567 or greater on their respective factors, and do not cross-load on an unintended factor greater than .40.

This factor structure supports previous findings regarding the distinction between performance inferences and liking (Van Kleef et al., 2010a), as well as those regarding the potential for either a reciprocal (mimicked anger) or complementary (anxiety; Tiedens, 2001) reaction to the expressed anger.

Alternative mechanisms. Following the procedure used by Tiedens (2001), participants rated the feedback provider on perceived competence with two trait semantic differential scales, including ratings of incompetent-competent and knowledgeable-ignorant (reverse scored; $\alpha = .47$). Given the low reliability of these two items, I focused only on the central item of

competence. In addition, in the final survey, participants were asked to recall the feedback given to them (Osborn's four brainstorming rules) and these were counted to identify the number of suggestions correctly recalled.

Manipulation checks. The current study attempted to manipulate media richness and thus emotional intensity. Participants were first asked to indicate how they had received the feedback from the provider, to ensure accurate and careful responding or to identify miscoded conditions. In addition, they were asked to rate the extent to which the feedback message they received was personal, was immediate, included a variety of cues, and included rich and varied language (items adapted from Vickery, 2004) in order to measure their perception of the four descriptors of media richness. I expected the two experimental conditions to vary on two dimensions (i.e. variety of cues, language) while holding the other two (i.e. immediacy, source) as well as the perception of social presence (i.e. degree to which both parties are physically co-present) constant.

I again wanted to confirm that the expressed emotion was perceived as more intense anger with the richer media condition (F2F vs. V2V), with little emotion perceived in the text condition. To assess emotional expressions shown in the manipulations, I included a list of negative and positive emotion terms. Principal components analysis with varimax rotation suggested three factors: anger (i.e., irritated, unhappy, disgusted, angry, and disappointed; $\alpha = .94$), anxiety (i.e., embarrassed, afraid, guilty, and nervous ($\alpha = .72$), and happy (i.e., proud, happy, and enthusiastic, $\alpha = .63$). Three averaged composites were made representing these emotional perceptions to assess whether the manipulations had the intended effects on anger intensity and not on other emotional expressions.

Additional manipulation checks. To ensure that manipulating the technology used was not simply manipulating the extent that participants were engaged in the task, which could explain any effects on performance (Van Kleef et al., 2010a), I included items asking about task engagement. Participants were asked four Likert-type questions (e.g. “I found it very engaging to come up with ideas in the last task”) on a scale of 1 (totally disagree) to 5 (totally agree) – ($\alpha = .85$). I derived a final task engagement score by taking the average of the four item scores. In addition, epistemic motivation (EM) was included due to the important role it has previously been found to play in the EASI model (Van Kleef et al., 2010a); I expected that I had similarly manipulated the motivation to seek structure and information (EM) and thus it should be fairly high and constant across condition. I included the same EM scale used by Van Kleef et al., 2010a ($\alpha = .81$), and derived a final epistemic motivation score by taking the average of the individual item scores.

Analysis

Data collected for the current study was entered and analyzed using SPSS 19.0. Before testing hypotheses, several steps were taken to clean the data. First, descriptive statistics (e.g. frequencies) were run for all variables to determine if any data was missing or out of range. Upon discovery of any such values, I referred back to the original survey instruments to determine whether they were due to errors on the part of the participant or data entry. Errors from data entry were corrected and missing values were treated as missing data. Second, reverse coded values were recoded according to instructions from their respective measures. Finally, reliabilities were calculated for all scales. After cleaning and preparing the data, I conducted analyses to test my proposed hypotheses.

The first two hypotheses propose effects of anger intensity (i.e. modality) on the EASI mechanisms. These effects can be evaluated by comparing group means with analysis of variance (ANOVA). The use of multivariate analysis of variance (MANOVA) is used to determine whether there is an omnibus mean difference across the three conditions (i.e. text, V2V, F2F) for multiple, related outcomes, simultaneously. This is appropriate, since the outcomes variables here (i.e. EASI mechanisms) are likely to be at least moderately related. In order to gain a comprehensive understanding of the differences, follow-up univariate analyses (ANOVAs) can test each outcome independently of the others, and planned comparisons clarify where such a differences occur (i.e. which specific group comparisons are different). Found differences (indicated by p-values of less than .05) would provide evidence that the intensity of anger, as manipulated by media richness, informs the relationship of anger expressions with the EASI mechanisms and performance. The absence of significant group differences could either indicate that there is no effect or that some moderating variable(s) may be in play. Further ANOVAs including the potential moderator as an additional fixed factor (i.e. independent variable) can be conducted to clarify.

The third hypothesis proposes an indirect effects mediation model from intensity of anger to performance outcomes through the EASI mechanisms. Traditional mediation analyses call for the predictor to be related to the outcome, and to the mediator, and then for the mediator to be associated with the outcome and the predictor's effect is reduced (as outlined by Baron & Kenny, 1986). However, it is also appropriate to test for indirect effects without a significant effect existing between the predictor and outcome (McFatter, 1979; Sheets & Braver, 1999), especially under certain circumstances (e.g. models with multiple mediators, models in which different signs are expected for the various paths (MacKinnon, Fairchild, & Fritz, 2007)). Thus, if either

Hypothesis 1 or 2 (predictor to mediators) is supported, I proceed with testing indirect mediation effects. Specifically, I conduct a multivariate analysis of covariance (MANCOVA) to test for group differences on the three (related) performance outcomes by condition, controlling for Task 1 performance. Significant differences indicate a direct effect. The polynomial contrasts option will be run to evaluate the relative appropriateness of a linear versus quadratic model.

Next, because the mediator variables are all continuous, it is most appropriate to use multiple regression to test the remaining conditions for mediation. Such results report both the cumulative predictive ability of the entire set of predictor variables as a model based on the change in variance explained, as well as the independent predictive ability of each one given the inclusion of the others based on significant beta coefficients. In the current study, two dummy variables are created to represent the categorical experimental conditions, with the text condition as the control condition (i.e. no emotion). Task 1 performance will be included in Step 1 as a control variable, and the dummy-coded variables will be included in Step 2 to evaluate the effect of the independent variable on the outcome after controlling for Task 1 performance. Then, the mechanism variables will be included in Step 3 to evaluate the relative linear effects of the mechanism variables and the independent variable. For indirect effect mediation, the overall step of the mediator variables should explain significant variation in the outcome, and I will then examine the specific mechanism(s) with significant coefficients. The Sobel test will be utilized to assess significance. Additionally, I had suggested that a quadratic (nonlinear) relationship of the mechanisms to performance may be more appropriate than a linear model. To test for this, I calculated squared terms for each of the mechanisms and add these as an additional step in the regression model after testing for linear effects. Finally, I will test other mechanisms and

interactive effects in an exploratory way, to fully understand why and when anger expressions during feedback motivate creative performance.

Results

Manipulation Checks

Manipulating the richness of media is meant to modify the perceived intensity and salience of emotional cues to the perceiver. First, I assessed whether the participants are accurately perceiving the media richness characteristics I meant to manipulate: 1) the communication channel for the feedback (i.e. whether they saw the feedback provider's face or heard the feedback provider's voice during feedback), and 2) the variety of cues available (i.e., face, voice, text). I expected that these objective manipulations would result in manipulating the perceived emotional expressions in that feedback (anger intensity). In addition, I wanted to rule out other factors that the manipulations could influence. First, I did not want the modality manipulations to be perceived as different in the *immediacy* of the response, the degree to which it was perceived as *personal*, or the perceived level of *social presence*, all of which could influence reactions. It is also possible that video stimuli is more engaging to college students than audio stimuli, and *task engagement* has been shown to influence performance (Van Kleef et al., 2010a). Accordingly, I also measured reported engagement (4 items from the previous paper). Finally, I attempted to enhance state *epistemic motivation* (i.e. the need to accurately understand one's surroundings) similarly by the instructions, and not have this vary by condition, since Van Kleef and colleagues (2010a) found that emotional expression influenced creative performance differently depending on participants' levels of trait *epistemic motivation* (i.e. the need to accurately understand one's surroundings). Finally, I needed to confirm that the manipulations were effectively influencing

perceived anger expressions, and not other emotions. It is possible, for example, that subtle facial cues could reveal other emotions (i.e., anxiety, happy) that were unintended and create differences by condition that are actually not due to anger intensity. Thus, I compared the manipulated conditions on other emotion composites (i.e., anxious, happy) as well as anger. Data from six of the 142 total participants (4% of the full sample) were dropped from further analyses because their responses to the questions asking whether they saw the feedback provider's face or heard the feedback provider's voice were discrepant from that expected for their respective communication technology manipulations.

Results from a one-way ANOVA on the anger composite variable showed significant differences by communication modality ($F(2, 133) = 30.97, p < .001, \eta^2 = .381$). Specific pairwise comparisons showed that the feedback provider was perceived as significantly more angry in the cF2F condition ($M = 4.64, SD = .212$) than either the V2V ($M = 2.90, SD = .214, p < .001, 95\% \text{ CI of the difference: } 1.142 \text{ to } 2.334$) or text ($M = 2.34, SD = .222, p < .001, 95\% \text{ CI of the difference: } 1.687 \text{ to } 2.900$) conditions, and the difference between the anger perceived in V2V compared with text was trending toward significance ($p = .074, 95\% \text{ CI of the difference: } -.054 \text{ to } 1.165$).

The current study was primarily interested in the discrete emotion of anger, and results from a one-way ANOVA on the one item for anger intensity showed a similar pattern of significant differences as the anger composite ($F(2, 133) = 34.23, p < .001, \eta^2 = .340$). Specific pairwise comparisons showed that participants in the cF2F condition ($M = 4.38, SD = 1.788$) perceived the feedback provider as more angry than those in the V2V ($M = 2.50, SD = 1.546, p < .001, 95\% \text{ CI of the difference: } 1.249 \text{ to } 2.517$) and text ($M = 1.80, SD = 1.226, p < .001, 95\% \text{ CI of the difference: } 1.947 \text{ to } 3.237$) conditions, and those in the V2V condition perceived more

anger than those in the text condition ($p < .05$, 95% CI of the difference: .061 to 1.358).

The univariate test for the second composite emotion, comprised of emotions linked to anxiety, indicated a trend toward significance ($F(2, 133) = 3.00, p = .053$). Pairwise comparisons indicated that the cF2F condition ($M=1.57, SD = .79$) was seen as significantly more anxious than the V2V ($M=1.29, SD = .51, p < .05$, 95% CI of the difference: .005 to .557) or text ($M=1.26, SD = .69, p < .05$, 95% CI of the difference: .032 to .594) conditions, but the latter two were not different from each other ($p = .824$, 95% CI of the difference: -.315 to .251).

Finally, there were no significant differences across the three conditions for perceived positive emotions ($F(2, 133) = 2.77, p > .05$), epistemic motivation ($F(2, 133) = .10, p > .05$), task engagement ($F(2, 133) = .17, p > .05$), the perceived immediacy of feedback ($F(2, 133) = .45, p > .05$), the extent to which the message was seen as personal ($F(2, 133) = .22, p > .05$), or the degree of social presence ($F(2, 133) = 1.26, p > .05$). Taken together, these results provide evidence that the stimuli did manipulate media richness, as well as the perception of expressive intensity of negative emotions (particularly, anger), and ruled out alternative explanations for differences across communication modalities. Descriptives and correlations for the mechanisms, performance outcomes, and perceived anger are presented below in Table 1.

Insert Table 1 about here

Hypothesis Testing

As there was some degree of correlation among the five variables included in the EASI model mechanisms – performance inferences, liking, felt anger, felt anxiety, felt positivity – the

first step in testing the hypotheses was to run a MANOVA on these by condition. Results suggested a significant omnibus multivariate result ($F(2, 133) = 8.37, p < .001$), providing justification for further separate investigations. ANOVA results for the mechanisms and manipulation checks are presented in Table 2, and those for performance outcomes and epistemic motivation (as a control) are presented in Table 3.

Insert Table 2 about here

Insert Table 3 about here

Performance inferences. The first hypothesis suggested that participants in the richer media conditions would report lower performance inferences (i.e. perceived that they performed worse on Task 1) compared with those in less rich condition and the control condition. A univariate ANOVA on performance inferences supports that the conditions had a significant overall effect ($F = 9.48, \eta^2 = .125$). I now turn to results from the planned comparisons (i.e. LSD) to determine where the significant differences existed (i.e. between which groups).

Partial support was found for hypothesis 1, in that participants in the richest condition (cF2F) had significantly lower performance inferences ($M = 1.88, SD = .554$) than those in either the V2V ($M = 2.33, SD = .586, p < .001, 95\% \text{ CI of the difference: } .210 \text{ to } .689$) or text conditions ($M = 2.35, SD = .614, p < .001, 95\% \text{ CI of the difference: } .224 \text{ to } .712$). However, contrary to the prediction, reported performance inferences were not significantly different

between the V2V and text conditions ($p > .05$). In other words, participants in the V2V and text conditions perceived the quality of their performance to be roughly equivalent based on the feedback. Thus, Hypothesis 1 was partially supported in that the most intense anger (i.e. cF2F) resulted in the lowest performance inferences, but there was no difference between the audio-only and text conditions.

Affective reactions. The second hypothesis suggested that participants in richer media conditions would report more negative affective reactions in the form of less liking of the feedback provider and more negative felt emotions compared with those in less rich conditions. Univariate ANOVA tests supported significant effects on each outcome: liking ($F = 36.31$, $\eta^2 = .353$), felt anxiety ($F = 4.89$, $\eta^2 = .069$), and felt anger ($F = 3.65$, $\eta^2 = .053$). Planned comparisons (i.e. LSD) were also examined here to determine the specific nature of the potential differences (i.e. between which groups).

As predicted, reported levels of liking of the feedback provider were found to be significantly different across all three conditions, with participants viewing the feedback provider as less likable in the cF2F condition ($M = 2.09$, $SD = .655$) than in either the V2V ($M = 2.83$, $SD = .749$, $p < .001$, 95% CI of the difference: .458 to 1.024) or text condition ($M = 3.32$, $SD = .664$, $p < .001$, 95% CI of the difference: .941 to 1.517), and less liking in V2V than in text ($p < .01$, 95% CI of the difference: .198 to .778). Thus, Hypothesis 2a was fully supported in that the more anger expressive cues available in the feedback, the more dislike participants reported for the feedback provider.

Hypothesis 2b proposed that participants receiving angry feedback in richer media conditions feel more anxious than those in less rich conditions. Results from the planned

comparisons show that participants in the richest condition (cF2F) had higher “anxious” scores ($M = 2.10, SD = 1.243$) than those in either the V2V ($M = 1.63, SD = .870, p < .05, 95\% \text{ CI of the difference: } .065 \text{ to } .873$) or text conditions ($M = 1.48, SD = .757, p < .01, 95\% \text{ CI of the difference: } .207 \text{ to } 1.030$). However, contrary to the prediction, “anxious” scores were not significantly different between the V2V and text conditions ($p > .05$). In other words, participants in the V2V and text conditions reported roughly equivalent levels of felt anxiety based on the feedback. With regard to Hypothesis 2c and felt anger, individuals in cF2F felt significantly more angry after the feedback ($M = 2.58, SD = 1.188$) than those in the text condition ($M = 1.96, SD = .916, p < .01, 95\% \text{ CI of the difference: } .163 \text{ to } 1.067$), while the V2V condition was not significantly different from either. Thus, Hypotheses 2b and 2c were both partially supported, in that participants in the richest media condition reported the most negative felt emotions. As expected, no significant differences by condition were found for felt positive emotions ($F(2, 133) = .08, p > .05$), which were generally low across condition. Thus, the manipulation effects are specific to negative feelings.

Subsequent task performance. First, I ran a multivariate analysis of covariance (MANCOVA) on the divergent thinking performance outcomes (i.e., fluency, flexibility, and originality), with Task 1 performance as the covariate so that I was predicting the change in performance for Task 2. Results produced no significant effects for the omnibus test. Upon further investigation of the outcomes independently, using one-way ANCOVAs, results appear to be trending toward a significant difference by condition for originality only. More specifically, the mean originality score for the V2V condition ($M = .79, SD = .084$) is higher than that for text ($M = .59, SD = .570, p = .099$) and cF2F ($M = .57, SD = .691, p = .051$), and the latter two are not significantly different ($p = .788$), suggesting an inverted U shape effect for anger expression

on originality – comparable results were found using repeated measures ANCOVA.

Additionally, an analysis of contrasts was run to determine the appropriateness of a linear versus quadratic model, and results indicate non-significance for the linear model ($p = .788$) but a significant effect for the quadratic ($p = .05$, 95% CI: $-.345$ to $-.010$). No significant differences were found across conditions for fluency or flexibility. Additionally, difference scores were calculated for each of the outcomes for an alternative analysis. Results were comparable with one exception: participants in the text condition ($M = -.06$, $SD = 4.82$) had significantly lower flexibility difference scores than those in either the V2V ($M = 1.75$, $SD = 3.69$, $p < .05$, 95% CI: $.208$ to 3.423) or cF2F ($M = 2.34$, $SD = 2.81$, $p < .01$, 95% CI: $.803$ to 4.002) conditions (see Figure 2 for a graphical representation).

Insert Figure 2 about here

I proceeded to test indirect effects despite the lack of direct effect of the manipulation on the creativity outcomes as per indirect mediation tests (Mackinnon et al., 2007), using dummy codes for the manipulations and a regression approach. Results from the Sobel test were not supportive of the mediated model ($p = .36$). Table 4 shows results of the multiple regression analysis used to test for mediation. As was the case with the MANCOVA analysis, no significant effects were found for the predictive ability of any of the variables for either fluency or flexibility, but trends were shown for originality. Specifically, the polynomial contrasts test indicated that it was more appropriate to consider a quadratic effect of intensity of anger on originality ($p < .05$).

Insert Table 4 about here

Next, as detailed in the previous section on analyses, a multiple regression analysis was run to examine the possibility of an indirect effect of the manipulations on creativity through the mechanisms. Note that Step 2 in this analysis is essentially a re-test of the MANCOVA performed in the previous paragraph (i.e. $X \rightarrow Y$). In Step 3 all four of the potential mechanisms were added: performance inferences, felt anger, felt anxiety, felt positive emotion. The overall step did not result in a significant change in R^2 , but the linear and quadratic coefficients for liking appeared to be having a significant individual effect, so an exploratory regression analysis was conducted considering the effect of this mechanism on originality in isolation. Results from this analysis can be found in Table 5. The change in R^2 for the linear model did not add any predictive ability for originality, but the quadratic model was trending toward significance ($p = .059$). Unexpectedly, inclusion of the linear term at Step 3 actually increases the effect of the V2V dummy code, so I did not test for indirect effects, since liking does not explain the found relationship between V2V communication of angry feedback and originality. However, it is interesting that the negative coefficient for the quadratic liking term supports an inverted-U shaped effect on originality (i.e. moderate levels of liking are optimal), as predicted.

Insert Table 5 about here

Given a lack of support for the mechanisms of performance inferences and anger/anxiety to

predict performance improvements, there is not much evidence for indirect effects as suggested in Hypothesis 3. Thus, I explored additional mechanisms that go beyond the EASI model, and the possibility of an interactive effect for the EASI model.

Exploratory Mechanisms

Competence. The perceived competence of the feedback provider may influence the extent to which recipients are willing to accept the feedback. I was interested to investigate whether the level of perceived competence in the feedback provider varied by communication modality and what impact this might have on performance. Due to the low reliability of the two-item measure, the singular competence item was used instead. Contrary to recent findings that greater expressed anger is associated with greater status (Tiedens, 2001), participants in the most anger expression (cF2F) condition perceived the feedback provider to be least competent ($M = 3.51, SD = .895$), and this condition was statistically different than both the V2V ($M = 3.93, SD = 1.031$) and text ($M = 3.88, SD = .980$) conditions ($F = 2.50, p < .05$), but the V2V and text conditions were not statistically different from each other. Results from a partial correlation of competence and the three performance outcomes indicated that it was significantly correlated with originality. As such, additional regression analyses were run (one with the full set of other potential mediators and one with just competence) to evaluate the possibility of an indirect effect. Results showed no significant effects.

Feedback content accuracy. The feedback literature suggests that feedback focusing recipients' attention to the task should result in performance improvements, and the feedback provided in the current study consisted of suggestions on how to maximize performance on the task. As such, I was interested to see if there were differences by condition for participants'

ability to recall the strategies provided and the resulting impact on performance, but no significant differences were found ($F(2,133) = .575, p > .05$). Thus, I did not examine this further as a mechanism.

Interaction effect of epistemic motivation. Work by Van Kleef and colleagues (2010a) has previously shown that epistemic motivation (EM) moderated the effect of expressed emotion on performance such that individuals high in EM benefited from angry expressions during feedback, while those low in EM did worse. As detailed above, I attempted to manipulate EM by making the task and feedback to the extent that all participants were engaged in the task and invested in their results, regardless of condition. While EM was not found to differ by condition, it is possible that differences among participants within conditions could be obscuring overall effects on the performance outcomes. As such, I conducted an additional regression analysis for each of the three performance outcomes to with the Task 1 control, the condition dummy variables, EM, and the interaction terms for each dummy variable and EM. Results for fluency and flexibility showed no significant effects, and results for originality, which can be found in Table 6, do show a significant effect for epistemic motivation at Step 2 but also no significant interaction.

Insert Table 6 about here

Comparison of Anger with No Emotion. One final post-hoc analysis involved comparing the cF2F (angry condition comparable to that used by Van Kleef et al, 2010a) with the control (no emotion) condition (i.e., text). Regression analyses analogous to those performed for the

three-way comparison was conducted and results were mostly comparable with one exception: a significant effect (i.e. change in R^2) of felt anger on flexibility. Results can be found in Table 7 and suggest that moderate levels of felt anger resulted in optimal levels of originality.

Insert Table 7 about here

Discussion

Drawing on the EASI Model (Van Kleef, 2009), the current study sought to investigate the effects of angry feedback on subsequent performance across varying levels of intensity (i.e. communication modalities). I found partial support for Hypotheses 1 and 2 regarding the effect of the intensity of expressed anger on the EASI mechanisms but very little support for Hypothesis 3 (i.e. mediating effect of the mechanisms in the intensity-performance link).

Anger Intensity and EASI Mechanisms

As previously discussed, the EASI Model (Van Kleef, 2009) suggests that expressed emotions can impact observer behavior in two ways: to what extent we feel we are meeting expectations and the degree to which the feedback elicits positive or negative affective reactions. With respect to performance inferences, results indicated that, following angry feedback, participants in the richest media condition (cF2F) felt like they performed the worst of the three conditions, while those in the other two conditions reported equivalent (and higher) levels of perceived quality of performance despite the significant difference in perceived anger. This suggests that differences in performance inferences are not solely influenced by the anger expression. Perhaps, individuals discount the personal relevance of the feedback to their

performance if they are not able to see the person. Studies investigating differences in social presence across interactions provide evidence to suggest that individuals who perceive their interaction partner as more distant (less socially present) report feeling less emotionally invested (Kiesler, Siegel, & McGuire, 1984; Sproull & Kiesler, 1986). Participants in the current study did not report differences in perceived social presence, but it is possible that they were affected without be consciously aware of it.

Encompassed within the affective reactions pathway are two different components: liking of the feedback provider and felt (discrete) emotions. The effect of anger intensity for liking was quite clear. Participants who perceived more intense anger in the feedback liked the feedback provider less. This is in line with research suggesting that excessive (i.e. inappropriate) anger expressions lead to less liking of the expresser (Geddes & Callister, 2007; Glomb & Hulin, 1997; Van Kleef et al., 2010b). A similar pattern was found for felt anger (i.e. more intense observed anger led to more intense felt anger). Results for felt anxiety, however, more closely resembled those found for performance inferences (i.e. participants in the most intense anger condition felt more anxious than the other two, but the text and V2V conditions had roughly the same effect on felt anxiety). As with performance inferences, this result suggests a ‘threshold’ effect for anger expressions, such that perhaps seeing the emotional expressions makes the anger cues more personal. Overall, though, it appears that participants perceived more intense anger in richer media, but that perhaps they did not allow it to have a personal impact in the audio-only condition.

Mediated Model

The broad prediction of the EASI model is that emotional expressions can influence

observers' behavior – in the current study, angry feedback and performance on a divergent thinking task. The closest I came to a direct effect was trending significance for originality (i.e. the uniqueness of responses relative to rest of the sample). Participants in the V2V condition seemed to increase their generation of original responses to a greater extent than those in the other two conditions. Participants were able to produce more original output when motivated by anger expressions without being distracted from the task by excessive anger. In the absence of a solid direct effect, remaining mediation analyses were run and found evidence that moderate levels of liking are optimal for originality, but why were there no effects on fluency and flexibility? The answer likely lies in the nature of what I was testing. Previous studies that have found support for the effects of anger on the same divergent thinking outcome variables were investigating effect of anger relative to some other emotion (e.g. happiness; Van Kleef et al., 2009). The current study was interested in the effect of varying levels of the intensity of the expressed emotion (i.e. anger). The fact that I found no differences for fluency or flexibility indicates that intensity of perceived anger – and thus, the choice of feedback delivery modality – does not appear to influence performance quantity or flexibility of thought.

When comparing only results from cf2F and text, the significant quadratic relationship found for felt anger and flexibility indicated that participants experiencing moderate levels of felt anger produced more flexible responses (i.e. more different types). This is counter to the argument behind the “broaden-and-build” hypothesis (Fredrickson, 1998) and warrants further investigation. However, interpreted within the context of the current study and in conjunction with the finding that more intensely perceived anger was associated with more felt anger, this result suggests that moderate levels of expressed anger are optimal for encouraging flexibility.

Implications

Results from the current study contribute to research in two ways. First, this study merged the literatures on emotions and media richness to provide evidence to support the idea that a particular negative emotion (i.e. anger) was perceived more intensely in richer media conditions. While the effect of media richness on other emotions is yet to be seen, it provides a potentially fruitful area of research in these increasingly digitally-driven times. Second, this study attempted to test the EASI model across different levels of emotional intensity to determine how technology-mediated communication might influence the effects of expressed emotions on performance. Results from the current study do not necessarily support a mediated model but the fact that the perceived intensity of emotion influenced the EASI model mechanisms suggests the need for further investigation to better understand how it fits into the broader model.

These results also have practical implications. First, more intensely perceived expressed emotions generally lead to more negative affective reactions in the observer. As such, if feedback providers feel angry and want to avoid bringing others down, communicating by the less rich media is the better (e.g. e-mail, or even phone). However, if the feedback provider wants others to feel that performance is lacking, expressing anger via those methods will not be as effective as video conferencing. The current study investigated the effects of the intensity of expressed emotions on performance, but the EASI model only stipulates the outcome as “observer behavior.” Given the influence intensity had on affective reactions, it may be worthwhile to consider effects on the positive or negative nature of interpersonal interactions at work, which may influence other important work outcomes as seen in studies (Weiss & Cropanzano, 1996).

For actually modifying work performance, the results were complex. Moderate levels of liking appear to have the optimal effect on originality. This suggests that feedback providers should try to balance the extent to which their recipients like them, but this may be somewhat

difficult to manipulate. This finding may be more useful in diagnosing the causes of performance deficiencies rather than motivating performance (i.e. stagnant performance as a result of the feedback provider and recipient being too positive or too negative terms).

Limitations

The current study has several limitations. First, the 3x1 experimental design did not allow for teasing out neutral emotions from the communication modality (e.g. neutral, positive). Rather, I focused on comparing effects across different intensities of a single emotion (i.e. expressed anger) manipulated through varying levels of media richness (i.e. different technology-mediated communication modalities). Because I did not have a comparison emotion condition for each of the modalities, it is difficult to separate effects caused by the technology from those caused by the intensity of the emotion. Future researchers would be wise to include at least one comparison emotion condition (e.g. 3(modality)x2(emotion)). Additionally, given the complex nature of the relationships I predicted, it is possible that the some of the effect sizes are rather small and a larger sample size needed.

Future Directions

As the primary topics considered in the current study (i.e. the EASI model, benefits of angry feedback, role of technology-mediated feedback) are still relatively new to the field, there are many different directions available for future research. Here, I list several of those possibilities.

First, as previously mentioned, future research should strive to include comparison emotions. The study by Van Kleef et al. (2009) comparing the effects of angry and happy leader expressions on team performance found that anger was more motivating for those high in EM,

while happiness was more motivating for those low in EM. A next step would be to investigate to investigate whether the same effect holds true for different intensities of both the positive and angry emotions. For example, if positive emotions are seen as more intense in richer media and more likely to be caught through emotional contagion, there might be a very powerful effect on creative performance outcomes (i.e. “broaden-and-build” – Fredrickson, 1998). This would be potentially useful to understand, as organizations do also give their employees positive feedback.

Second, as also previously mentioned, there is a real need to considering the long-term effects of these angry feedback scenarios. If this type of feedback is a regular occurrence – due to either poor performance or an unreasonable supervisor – it could have deleterious effects on relational aspects of the workplace, including perceived injustice and stress. While the one-way nature of communication used in the current is not so uncommon in the modern workplace (e.g. e-mail), the one-time nature of the situation (i.e. feedback from a stranger) is not necessarily characteristic of the typical workplace feedback scenario. Further, recent research suggests that even relatively subtle negative interactions in the workplace have the potential to escalate (Andersson & Pearson, 1999). Accordingly, future research should examine the effects of this kind of feedback in familiar pairs (i.e. supervisor-subordinate), as well as the long-term effects in longitudinal studies.

A third promising direction involves comparing results across individual differences (e.g. gender of the feedback provider and feedback recipients’ emotion recognition ability). In the case of gender, the literature provides mixed results regarding the effects of agentic versus communal displays and actions from men and women (e.g. Eagly & Karau, 2002; Glomb & Hulin, 1997). For example, Glomb and Hulin (1997) present an interesting finding wherein female supervisors were rated higher than their male counterparts regardless of the degree of

anger they expressed. The authors suggest that this may be the result of giving the female supervisor additional credit for holding a supervisory position at all (i.e. “the dancing bear” effect; Abramson, Goldberg, Greenberg, & Abramson, 1977). Adding a comparable female stimulus set to the current design would allow researchers to further investigate how angry expressions may be perceived differently coming from men compared to women and any possible interactions with communication modality. Also, it seems logical that an individual’s ability to recognize and interpret emotions in others would influence the effect of communication modality (i.e. perceived intensity). For example, the additional salience of emotions in richer mediums may have less influence on the performance of individuals who are good at recognizing and interpreting emotions, because they comprehend the message even at the most subtle level.

Three final suggestions for future directions involve minor tweaks to the current paradigm: using a different type of outcome task, including a version of the clips with less ambiguous verbal content, and including a version of the clip with visual cues only. The first change would allow researchers to ask whether results differ depending on the degree to which an individual can be certain about the quality of his or her performance. Does increased certainty regarding one’s performance prior to feedback minimize the effect of emotional expressions on performance inferences? The second change would allow researchers to address the importance of emotional expressions (including level of intensity) in when the verbal content is more or less clear. According to the EASI model, expressed emotions should matter less if the expressed verbal content is clear, but other research suggests that this is not the case – as when the emotion expressed and verbal message are incongruent (Dasborough & Ashkanasy, 2002). Finally, adding a condition with only visual cues (i.e. no sound) would allow researchers to isolate whether the effect of modality on perceived intensity is driven by a cumulative effect (i.e. more

cues lead to more intensity) or by facial expressions and body language alone.

Conclusion

Results presented here generally support the idea that angry expressions in feedback provide information – beyond what is conveyed explicitly by the verbal content of the feedback message. In some cases, these angry emotional expressions may help bolster feedback effectiveness, but there may be a point of diminishing returns at which anger is no longer helpful. In general, the more intensely you wish your message to be perceived (at least with regard to anger), the richer the media you should choose – but be aware of the potential consequences this choice may have on performance inferences and affective responses. Additional investigation is warranted to better understand the role of emotional intensity in the EASI model.

Table 1

Descriptive Statistics and Correlations Between Variables

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
EASI Mechanisms											
1. Performance Inferences	2.18	0.620	-								
2. Liking	2.73	0.852	.327**	-							
3. Felt Anxiety	1.75	1.014	-.298**	-.157	-						
4. Felt Anger	2.27	1.097	-.326**	-.345**	.637**	-					
5. Felt Positive Emotion	2.57	1.130	.330**	.198*	.047	-.056	-				
Task 2 Performance Outcomes											
6. Fluency	13.92	6.996	.005	.089	-.085	-.162	-.114	-			
7. Flexibility	8.05	3.368	.065	.119	-.013	-.172*	-.006	.802**	-		
8. Originality	0.65	0.718	.089	.082	-.027	-.017	.115	-.458**	-.403**	-	
Manipulation											
9. Perceived Anger	2.93	1.888	-.414**	-.593**	.350**	.448**	-.067	-.069	-.066	-.098	-

Table 2

Results from Analyses of Variance (ANOVAs) – Mechanisms and Manipulation Checks

Variables	Text		V2V (Audio-only)		cF2F (Audio-visual)		Planned Comparisons
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
EASI Mechanisms							
Performance Inferences	2.35	(.614)	2.33	(.586)	1.88	(.554)	9.48**** 1-3****, 2-3****
Liking	3.32	(.664)	2.83	(.749)	2.09	(.655)	36.31**** 1-2****, 1-3****, 2-3****
Felt Anxiety	1.48	(.757)	1.63	(.870)	2.10	(1.243)	4.89**** 1-3****, 2-3**
Felt Anger	1.96	(.916)	2.25	(1.090)	2.58	(1.188)	3.65** 1-3****
Felt Positive Emotion	2.66	(1.203)	2.54	(1.112)	2.53	(1.100)	0.08
Exploratory Mechanisms							
Competence	3.88	(.980)	3.93	(1.031)	3.51	(.895)	2.5* 2-3**
Feedback Content Accuracy	2.44	(.808)	2.48	(.794)	2.60	(.744)	.575
Manipulation Checks							
Perceived Anger ^a	1.80	(1.226)	2.50	(1.546)	4.38	(1.788)	34.23**** 1-2****, 1-3****, 2-3****
Epistemic Motivation	3.48	(.757)	3.43	(.622)	3.50	(.686)	0.10
Task Engagement	3.75	(.827)	3.85	(.851)	3.78	(.796)	0.17
Immediacy	3.52	(1.708)	3.35	(1.636)	3.65	(1.220)	0.45
Personal Source	2.63	(1.328)	2.46	(1.277)	2.60	(1.346)	0.22
Social Presence	2.56	(1.333)	2.30	(1.093)	2.68	(1.065)	1.26

Note. *N* = 136 (43, text condition; 46, V2V condition; 47, cF2F condition), *M* and *SD* values are descriptives, *F*-values and planned comparisons are from ANOVAs, ^a single item

* *p* < .10. ** *p* < .05. *** *p* < .01. **** *p* < .001.

Table 3

Results from Analyses of Variance (ANOVAs) – Performance Outcomes and Controls

Variables	Text			V2V (Audio-only)			cF2F (Audio-visual)			Planned Comparisons
	M	SD		M	SD		M	SD	F	
Task 1 Performance										
Fluency	10.49	(4.337)		10.65	(5.326)		10.72	(6.303)	.022	
Flexibility	8.59	(4.345)		6.13	(3.953)		5.45	(2.749)	8.69	1-2***, 1-3****
Originality	.51	(.588)		.52	(.745)		.54	(.803)	.016	
Task 2 Performance										
Fluency	14.69	(6.665)		13.85	(7.911)		13.28	(6.395)	1.082 ^a	
Flexibility	8.52	(3.164)		7.88	(3.667)		7.79	(3.270)	.233 ^a	
Originality	.58	(.570)		.79	(.850)		.57	(.691)	2.254 ^a	1-2*, 2-3*
Control										
Epistemic Motivation	3.48	(.757)		3.43	(.622)		3.50	(.686)	.098	

Note. N = 136 (43, text condition; 46, V2V condition; 47, cF2F condition), M and SD values are descriptives, F-values and planned comparisons are from ANOVAs

^aANCOVA results – controlling for Task 1 Performance

* p < .10. ** p < .05. *** p < .01. **** p < .001.

Table 4

Summary of Multiple Regression Analysis for Time 2 Originality (EASI Mechanisms)

Predictor	<i>B</i>	β	R^2	(ΔR^2)
Step 1				
Task 1 Originality	0.60**	0.60	0.358	(0.358)**
Step 2				
Task 1 Originality	0.60**	0.60	0.380	(0.022)*
V2V	0.21*	0.14		
cF2F	-0.03	-0.02		
Step 3				
Task 1 Originality	0.63**	0.63	0.403	(0.023)
V2V	0.27**	0.18		
cF2F	0.07	0.05		
Performance Inferences	-0.09	-0.07		
Liking	0.15*	0.17		
Felt Anxiety	0.01	0.02		
Felt Anger	0.04	0.06		
Step 4				
Task 1 Originality	0.63**	0.63	0.428	(0.024)
V2V	0.25*	0.16		
cF2F	0.09	0.06		
Performance Inferences	-0.10	-0.09		
Liking	0.15*	0.18		
Felt Anxiety	-0.01	-0.01		
Felt Anger	0.06	0.08		
Performance Inferences ²	-0.11	-0.08		
Liking ²	-0.11*	-0.13		
Felt Anxiety ²	0.00	0.01		
Felt Anger ²	-0.01	-0.01		

Note. V2V = audio-only; cF2F = audio-visual; ² indicates quadratic terms.

* $p < .10$. ** $p < .05$.

Table 5

Summary of Regression Analysis for Time 2 Originality (Liking Only)

Predictor	<i>B</i>	β	R^2	(ΔR^2)
Step 1				
Task 1 Originality	0.60**	0.60	0.359	(0.359)**
Step 2				
Task 1 Originality	0.60**	0.60	0.380	(0.021)
V2V	0.20*	0.13		
cF2F	-0.03	-0.02		
Step 3				
Task 1 Originality	0.61**	0.61	0.393	(0.012)
V2V	0.26**	0.17		
cF2F	0.11	0.07		
Liking	0.12	0.14		
Step 4				
Task 1 Originality	0.61**	0.61	0.409	(0.017)*
V2V	0.24*	0.16		
cF2F	0.12	0.08		
Liking	0.12*	0.14		
Liking ²	-0.12*	-0.13		

Note. V2V = audio-only; cF2F = audio-visual; ² indicates quadratic term.

* $p < .10$. ** $p < .05$.

Table 6

Summary of Regression Analysis for Time 2 Originality (Epistemic Motivation X Condition Interaction)

Predictor	<i>B</i>	β	<i>R</i> ²	(ΔR^2)
Step 1				
Task 1 Originality	.60**	.07	.359	(.359)**
Step 2				
Task 1 Originality	.57**	.07	.402	(.043)*
V2V	.19	.12		
cF2F	-.03	.12		
EM	-.16*	.07		
Step 3				
Task 1 Originality	.57*	.07	.415	(.013)
V2V	.19	.12		
cF2F	-.03	.12		
EM	-.08	.12		
V2V * EM	-.27	.18		
cF2F * EM	-.02	.17		

Note. V2V = audio-only; cF2F = audio-visual; EM = Epistemic Motivation.

* $p < .10$. ** $p < .05$.

Table 7

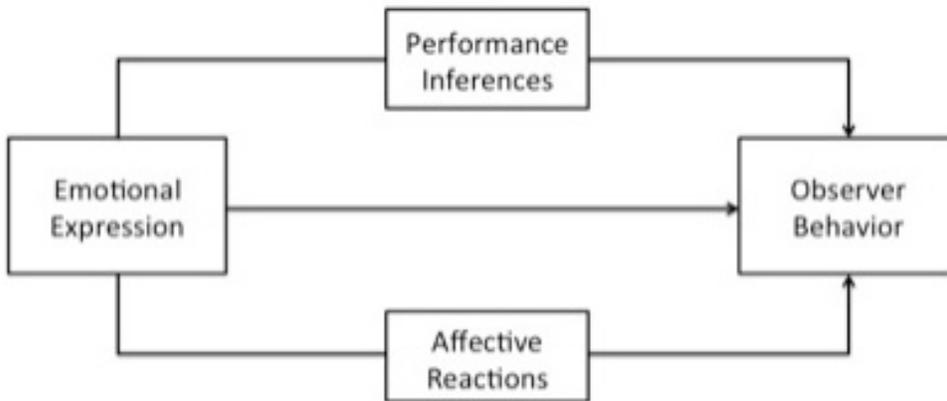
Summary of Regression Analysis for Time 2 Flexibility (Felt Anger Only – cF2F vs. Text)

Predictor	<i>B</i>	β	R^2	(ΔR^2)
Step 1				
Task 1 Flexibility	0.30**	0.36	0.132	(0.132)**
Step 2				
Task 1 Flexibility	0.32**	0.38	0.134	(0.002)
cF2F	0.28	0.04		
Step 3				
Task 1 Flexibility	0.31**	0.38	0.135	(0.001)
cF2F	0.32	0.05		
Felt Anger	-0.08	-0.03		
Step 4				
Task 1 Flexibility	0.31**	0.37	0.179	(0.044)**
cF2F	0.36	0.06		
Felt Anger	3.42**	1.17		
Felt Anger ²	-0.66**	-1.22		

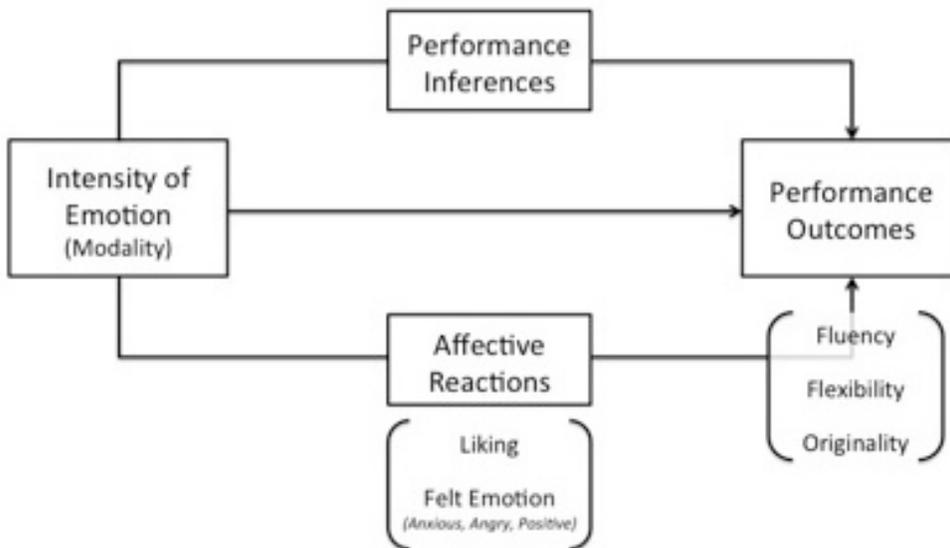
Note. V2V = audio-only; cF2F = audio-visual; ² indicates quadratic term.

* $p < .10$. ** $p < .05$.

Figure 1: Original EASI Model (a) compared to the model tested in the current study (b) – specifying operationalizations of EASI variables.

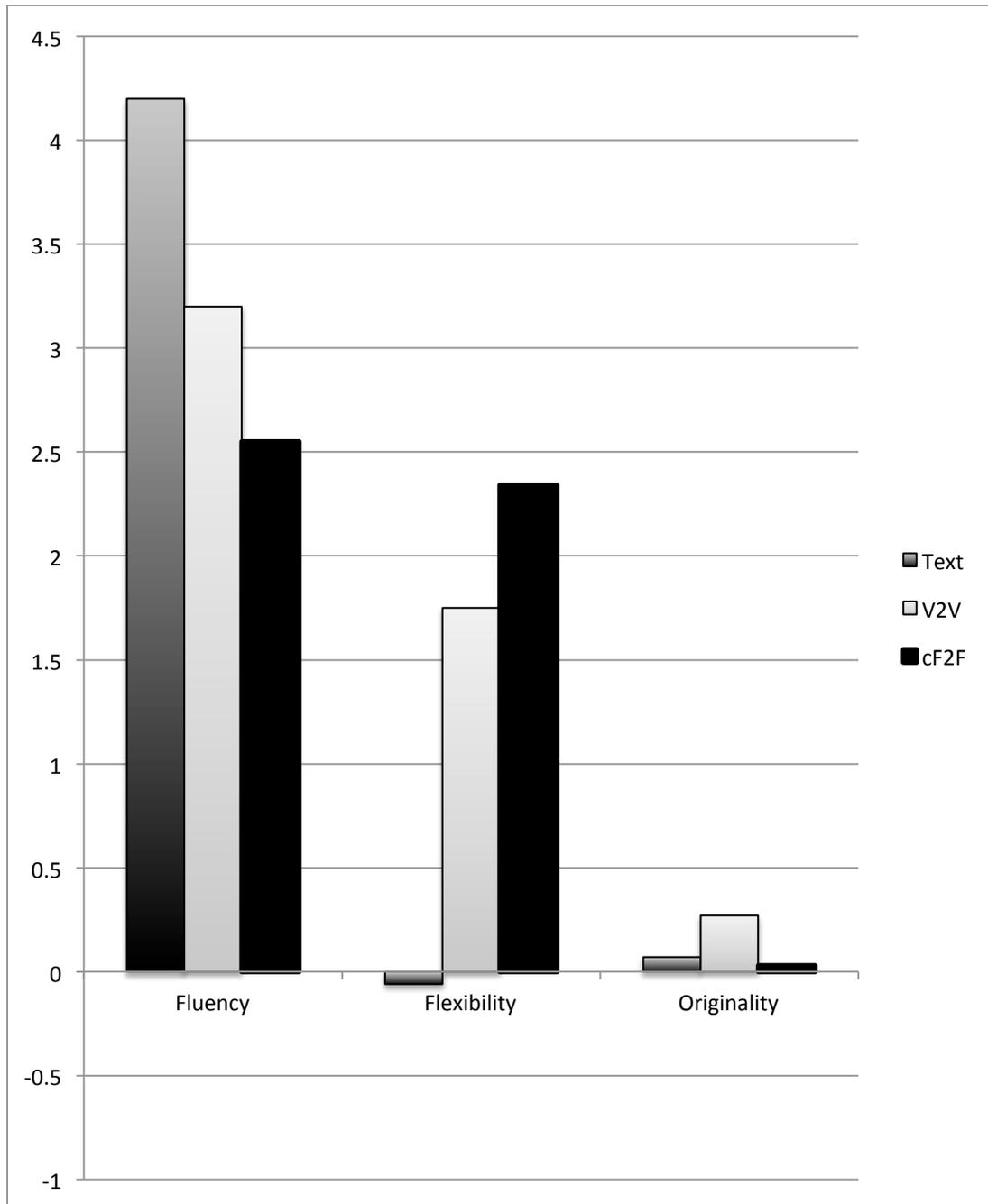


a)



b)

Figure 2. Difference scores for performance outcomes by condition – calculated by subtracting participants’ scores on Task 1 from their scores on Task 2. Significant differences were found for flexibility, such that participants in both the V2V and cF2F conditions saw greater improvements than those in the text condition. Additionally, the comparison between V2V and cF2F was trending toward significance for originality. No differences were found for fluency.



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Appendix A

Hi, my name is Jeff Lovelace. I'll be giving you feedback today on your creative performance, and then you'll move on to the second task.

First, I'd say the more ideas the better. You need to focus on your quantity.

*Also, the more **unusual** the ideas the better. You need to think outside the box.*

You should try to combine and improve your ideas before you submit them. That will help with their quality.

Also – don't forget – it's really important not to criticize your ideas during this kind of task. That should help generate creative responses.

I think that's about all I have for you. Good luck on your second task.

Appendix B

Demographics Questionnaire

Instructions: Please indicate the following information about yourself.

1. *Gender:*

Male

Female

2. *Age:* _____

3. *Current GPA:* _____

4. *Class Rank:*

Freshmen

Sophomore

Junior

Senior

5. *Race/Ethnic Identity:*

American Indian / Native American

Hispanic / Latino

Asian

Pacific Islander

Black / African American

White / Caucasian

Other

Individual Differences – Section 2

Instructions: Read each of the following statements and decide how much you agree with each according to your attitudes, beliefs, and experiences. It is important for you to realize that there are no “right” or “wrong” answers to these questions. People are different, and we are interested in how you feel. Please response according to the following 6-point scale:

1 = *strongly disagree*

4 = *slightly agree*

2 = *moderately disagree*

5 = *moderately agree*

3 = *slightly disagree*

6 = *strongly agree*

- ___ 1. It upsets me to go into a situation without knowing what I can expect from it.
- ___ 2. I'm not bothered by things that interrupt my daily routine.
- ___ 3. I enjoy having a clear and structured mode of life.
- ___ 4. I like to have a place for everything and everything in its place.
- ___ 5. I enjoy being spontaneous.
- ___ 6. I find that a well-ordered life with regular hours makes my life tedious.
- ___ 7. I don't like situations that are uncertain.
- ___ 8. I hate to change my plans at the last minute.
- ___ 9. I hate to be with people who are unpredictable.
- ___ 10. I find that a consistent routine enables me to enjoy life more.
- ___ 11. I enjoy the exhilaration of being in unpredictable situations.
- ___ 12. I become uncomfortable when the rules in a situation are not clear.

Feedback Provider Bio

PsychMail Username: [JLovelace](#)

Creativity has been linked to beneficial outcomes such as school and career success. Today, you will have the opportunity to develop your skills with a creativity task and feedback to help you improve over time.

The individual who will be providing your feedback today is **Dr. Jeff Lovelace, who is a visiting scholar from the Center for Creative Leadership (CCL).**



Dr. Lovelace is an expert in the field of creativity and has a great deal of experience providing performance feedback to students like you. Some of his relevant experience and accomplishments include:

- A Ph.D. in Industrial/Organizational Psychology from University of Maryland.
- Ground-breaking research on creativity in organizational settings, including:
 - Google
 - Aerosoles
 - Military Intelligence Organizations
- Assessment and Development of Creativity in academic and applied settings
 - Penn State students
 - Applied Research Lab (ARL)
 - PNC Leadership Assessment Center
 - United States Military Academy at West Point

**** Dr. Lovelace is interested in seeing the creativity of our Penn State students and we hope you take advantage of this opportunity to enhance your creativity with feedback from Dr. Lovelace.****

In addition to practicing your creative skills in today's tasks, we are also able to provide you with **feedback** on your performance from one of several **highly experienced** creativity researchers, well known within their field.

← To the left, you will find
← information about your
← feedback provider.

Once you have read over the “Feedback Provider Bio” to the left, please turn the page.

Appendix D

Please follow to instructions below to complete Task 1

1) **Task 1** – List as many uses as you can for a **potato**.

*Type your responses into the open Word document – “1”

*Please type one response per line, ending with a comma

You have 8 minutes to complete this task.

After 8 minutes, please follow the instructions below:

Task Example Text:

Example,
Example,
Example,
Example,
Etc.

2) Sending responses to the feedback provider:

a. Highlight all the text (“Ctrl+A”)

b. Copy the text (“Ctrl+C”)

c. Open “PsychMail” program from Desktop

d. Enter the following login information:

Username: **PsychLab**

Password: **Lab1**

e. Click “Login”

f. Click “Mail”

g. Click “Compose”

h. Paste responses from Word document “1” (“Ctrl+V”)

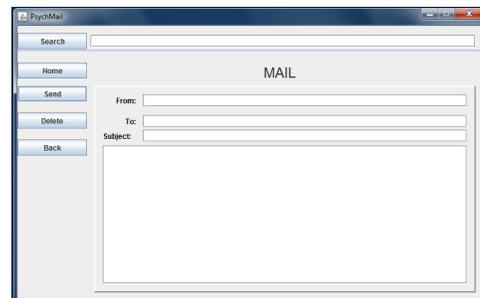
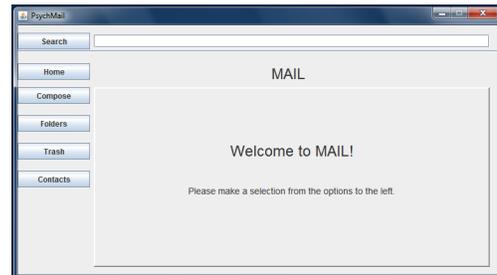
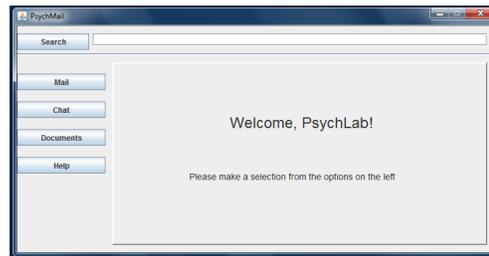
i. Fill in the following information:

From: **[Your Participant #]** (on computer)

To: **JLovelace**

Subject: **1**

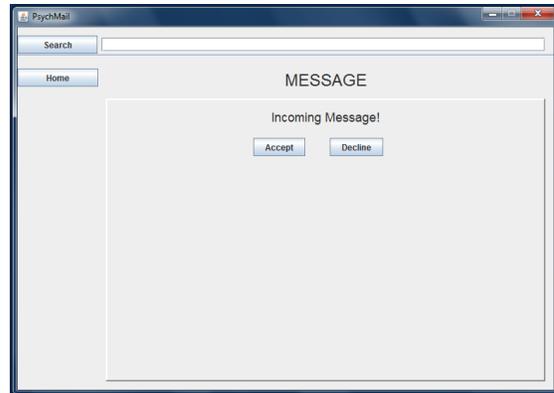
j. Click “Send”



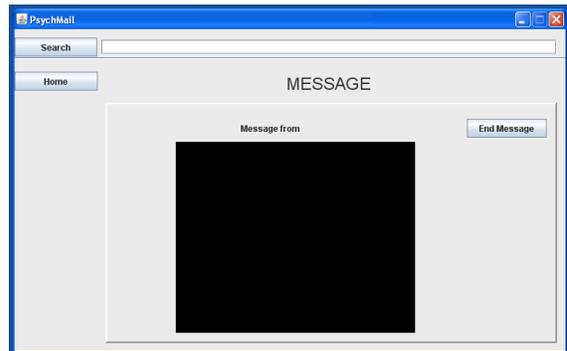
3) Turn to the next page.

4) Your feedback provider will review your responses and should get back to you in 3-4 minutes via the PsychMail system as pictured to the right (→)

When you see the incoming message alert, please click “**Accept**” to receive your feedback.



Example Feedback screen →



Please wait patiently for your feedback provider.

They will contact you once they have reviewed your responses and will refer to your responses during the feedback.

5) After receiving your feedback, please end the connection by clicking the “Home” button.

6) Move on to Folder 2.

Appendix E

Current Feelings

Instructions: Please rate the extent to which each of the following adjectives describes your current feelings.

Very Slightly or
Not at All

1 2 3 4 5 6 Extremely
7

___ 1. angry ___ 6. disgusted ___ 11. happy
___ 2. afraid ___ 7. distressed ___ 12. irritated
___ 3. bored ___ 8. embarrassed ___ 13. nervous
___ 4. contemptuous ___ 9. enthusiastic ___ 14. proud
___ 5. disappointed ___ 10. guilty ___ 15. unhappy

Feedback Reactions - 1

Instructions: Please indicate the extent to which you agree with the following statements.

Strongly Somewhat Neither Agree Somewhat Strongly
Disagree Disagree nor Disagree Agree Agree
1 2 3 4 5

___ 1. I feel that the feedback provider was satisfied with my performance.
___ 2. I feel that the feedback provider had expected more of me.
___ 3. I feel that the feedback provider thought I had performed poorly.
___ 4. I think I made a good impression on the feedback provider.
___ 5. I feel that the feedback provider was disappointed in my performance.
___ 6. The feedback provider has made a positive impression on me.
___ 7. The feedback provider appears to be a nice person.
___ 8. The feedback provider seems sympathetic.
___ 9. The feedback provider struck me as an unlikable person.
___ 10. I would like to work with this feedback provider in the future.
___ 11. The feedback provider seems to be a sociable person.
___ 12. I was satisfied with the content of the feedback I received (e.g., what was said).
___ 13. I was satisfied with the way I received feedback (e.g., the way it was delivered).
___ 14. I would be interested in receiving future feedback from this feedback provider.
___ 15. Next time, I would want to receive feedback from a different feedback provider.

Appendix F

Task Engagement

Instructions: Please indicate your agreement with the following statements.

1 (totally disagree) ----- 2 ----- 3 ----- 4 ----- 5 (totally agree)

- ___ 1. I was motivated to generate ideas in the last task.
- ___ 2. I found it very engaging to come up with ideas in the last task.
- ___ 3. I tried my best to come up with as many ideas as possible in the last task.
- ___ 4. I found this task to be engaging.
-

Feedback Perceptions

Instructions: Please rate the extent to which the following emotions were expressed to you by the feedback provider. To what extent did he seem....

Very Slightly or Not at All							Extremely
1	2	3	4	5	6	7	

- | | | |
|---------------------|---------------------|-------------------|
| ___ 1. angry | ___ 6. disgusted | ___ 11. happy |
| ___ 2. afraid | ___ 7. distressed | ___ 12. irritated |
| ___ 3. bored | ___ 8. embarrassed | ___ 13. nervous |
| ___ 4. contemptuous | ___ 9. enthusiastic | ___ 14. proud |
| ___ 5. disappointed | ___ 10. guilty | ___ 15. unhappy |

Instructions: Please answer the following questions regarding the feedback you were provided with today.

1. When receiving the feedback about your creativity, did you see the feedback provider's face through the computer interface?
 Yes
 No

2. When receiving the feedback about your creativity, did you hear the feedback provider's voice through the computer interface?
 Yes
 No

3. To what extent did you perceive the feedback to be personal, directed specifically to you?

Impersonal ----- Personal
1 2 3 4 5

4. To what extent did you perceive the feedback provider to be close in proximity to you (how nearby did he feel)?

Distant ----- Close
1 2 3 4 5

5. To what extent did you perceive the feedback provider to be sociable (how interested in interacting with you)?

Unsociable ----- Sociable
1 2 3 4 5

6. To what extent did you perceive the feedback provider to be sensitive (how concerned about your feelings and reactions)?

Insensitive ----- Sensitive
1 2 3 4 5

7. To what extent did you perceive the feedback provider to be warm (how pleasant)?

Cold ----- Warm
1 2 3 4 5

Strategy Recall Accuracy

Instructions: Please use the space below to list the suggestions given to you by the feedback provider. Try to remember as many of them as you can.