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## Different Moods Lead to Different Creativity: Mediating Roles of Ambiguity Tolerance and Team Identification

Tae Jin Hwang<sup>a</sup> and Jin Nam Choi <sup>b</sup>

<sup>a</sup>Washington University in St. Louis; <sup>b</sup>Seoul National University

### ABSTRACT

The present study examined the effects of workplace mood states on employee creativity. Workplace mood was classified into four categories based on valence and activation to address a recent debate regarding the ambivalent effects of positive and negative moods on creativity and to examine the significance of the activation level of a given mood. To clarify the mood–creativity relationship, the four kinds of moods were proposed to have distinct effects on proactive and responsive engagement in creativity. The research hypotheses were tested using the data collected from 292 employees and 109 managers of Korean organizations. Multilevel path-analytic model indicated that positive and negative activating moods were positively related to proactive and responsive creativity, respectively. The effect of positive activating mood was mediated by ambiguity tolerance and team identification. Positive deactivating mood was negatively related to both types of creativity, whereas negative deactivating mood was unrelated to either type.

### ARTICLE HISTORY

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Various individual and situational predictors of creativity, which is a key determinant of organizational success and survival, have been examined (Hennessey & Amabile, 2010). This research stream has steadily investigated the role of mood, but the results remain inconclusive. In contrast with early studies that advocated either a positive or a negative mood state in enhancing creativity (Isen, Daubman, & Nowicki, 1987; Kaufmann & Vosburg, 1997), recent studies have acknowledged the potential contributions of both positive and negative mood states to creativity (Bledow, Rosing, & Frese, 2013; De Dreu, Baas, & Nijstad, 2008; To, Fisher, Ashkanasy, & Rowe, 2012). For example, mood-as-information model (Schwarz & Clore, 1996) provides theoretical accounts regarding the potential positive effects of positive and negative moods on creative performance. Moreover, George and Zhou (2007) claimed that positive and negative moods complement to improve creativity, and they showed that creativity is optimal when individuals experience both positive and negative moods under supportive contexts. The present study further elaborates the distinct effects of positive and negative moods on the creativity of employees.

Prior theoretical frameworks and empirical findings suggest that both positive and negative moods can enhance creativity (De Dreu et al., 2008; Kaufmann, 2003; Kaufmann & Vosburg, 1997). However, the assumption that the moods with opposite valence lead

to the same outcome may be unreasonable. Creativity has been broadly defined in most studies as a production of novel and potentially useful ideas. However, this broad and general conceptualization of creativity has been reconsidered, and several attempts have been made to distinguish among different types or dimensions of creativity (Montag, Maertz, & Baer, 2012; Unsworth, 2001). The present study attempts to reconcile the mixed results on the mood–creativity link by questioning the idea that the creativity promoted by different moods is the same and by theorizing that different moods may lead to various types of creativity through distinct intermediate mechanisms.

### Theoretical framework and hypotheses

#### *Mood–creativity relationship*

Moods are relatively enduring and less object specific in comparison with emotions, which are short-lived and highly directed toward a specific stimulus (Frijda, 1993). Moods and emotions are regarded as subtypes of affect, which is defined as “a neurophysiological state that is consciously accessible as a simple, non-reflective feeling that is an integral blend of hedonic and arousal values” (Russell, 2003, p. 147). Complementing discrete emotion theory (Izard, 1993) and the view that affect is categorized by six to twelve factors (Nowlis & Nowlis,

1956), Russell (1980) proposed that various affective states in a circumplex model of affect can be organized based on two dimensions, namely, activation and valence. Activation, also called arousal, refers to “a person’s state of readiness for action or energy expenditure” (Russell, 2003, p. 156), whereas valence distinguishes the pleasant tones from the unpleasant ones.

In their mood-as-information model, Schwarz and Clore (1996) argued that moods can convey information about the state of an environment (Carver, 2003). Specifically, moods signal a state of a goal achievement, which directs subsequent cognitive processing (Carver, 2003). Signaling a problem-free situation, positive moods lead to playful and flexible cognitive processes (Murray, Sujan, Hirt, & Sujan, 1990) and broaden the scope of attention (Fredrickson & Branigan, 2005). Hence, positive moods facilitate effortless and extra flexible thinking, which can be useful for quickly connecting ideas from diverse areas, thereby enhancing creativity (Isen et al., 1987). By contrast, negative moods signal a problematic situation that urges people to engage in effortful and analytic thinking to resolve the challenges (George & Zhou, 2002). Thus, negative moods can promote analytic and systematic styles of thinking to assess and address the deficiency in a situation, which can also improve creativity.

De Dreu et al. (2008) further extended the mood-as-information model and theorized that the activation level of mood, apart from valence, should be considered to understand the mood–creativity link. In contrast to deactivating mood, activating mood can increase creativity because activation enlarges the capacity to process information and provides motivation to challenge the status quo (Baas, De Dreu, & Nijstad, 2008). Activation increases the likelihood of creativity, whereas valence may determine the specific pathway to creativity. Positive activating mood can enhance the originality of ideas through its effect on cognitive flexibility, whereas negative activating mood can increase the amount of ideas through its effect on persistence. Thus, positive and negative moods may result in various types of creativity.

### **Proactive and responsive creativity**

Creativity has various types (Kaufmann, 2004; Montag et al., 2012; Unsworth, 2001). Unsworth (2001) categorized creativity into four types based on two dimensions, namely, the problem type (discovered by oneself vs. specified by others) and the driver for engagement (external vs. internal). These dimensions may not be orthogonal because when the problem is specified by others, the driver for engagement is likely external, and

vice versa. Similarly, Montag et al. (2012) distinguished between expected and unexpected creativity – expected creativity is externally driven so that a lack of creativity can be punished, whereas unexpected creativity is internally driven, without any fear of punishment for not performing creatively. Various types of creativity may have different antecedents. For example, extrinsic rewards can increase the expected creativity but decrease the unexpected one (Deci & Ryan, 1985).

Sung, Antefelt, and Choi (2017) demonstrated the discriminant validity of proactive versus responsive creativity. These types of creativity are the most contrasted in the typology of Unsworth (2001) and reflect the distinction suggested by Montag et al. (2012). Proactive creativity refers to the volunteered solutions for self-discovered problems. In other words, proactive creativity occurs when employees identify new problems and voluntarily suggest creative solutions. By contrast, responsive creativity refers to the required solutions for problems specified by others. Thus, responsive creativity occurs when employees generate creative solutions in response to external demands. Sung et al. (2017) found that proactive and responsive creativity emerge when employees are psychologically empowered and cognitively overloaded, respectively.

### **Different moods lead to different types of creativity**

Moods provide information about the state of internal and external environment, thereby shifting people’s information processing styles and attentional focus (Carver, 2003; Schwarz & Clore, 1996). As such, positive activating moods may enhance proactive creativity. Individuals in positive activating moods, such as excitement, can easily recall their successful memories, during which they felt joyful and excited (Forgas & Bower, 1987; Michael, Hou, & Fan, 2011). With successful memories in mind, they will explore and initiate new possibilities even without external instructions because they are confident about their judgment and expect favorable outcomes of their venture (Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005). Positive activating moods promote openness toward other possibilities by signaling the absence of urgent problems (Derryberry & Tucker, 1994). People also become open to novel issues with a broad scope of attention, which promotes the discovery of previously unattended opportunities (Fredrickson & Branigan, 2005; Rowe, Hirsh, & Anderson, 2007). Based on an optimistic stance and attention to broad issues, individuals in positive activating moods tend to explore new possibilities and experiment by combining various ideas.

*Hypothesis 1: Positive activating moods are positively related to proactive creativity.*

Conversely, negative activating moods can lead individuals to develop and display responsive creativity. Individuals in negative activating moods, such as anxiety, can readily recall their failures or mistakes. Accordingly, they feel insecure and tend to carefully and persistently examine the issue at hand to avoid repeating their mistakes or failures, which have mood-congruent contents (Forgas & Bower, 1987; Marks & Nesse, 1994). With the strong intent to prevent any additional loss or threats to personal resources, these individuals may place significant emphasis on fulfilling organizational expectations and task demands (Maslach, Schaufeli, & Leiter, 2001). In this respect, careful and persistent information processing style associated with the experience of negative activating moods may help employees respond to creative demands and identify solutions as expected (De Dreu et al., 2008; George & Zhou, 2002).

Moreover, employees in negative activating moods can favor the problems specified by others because insecurity compels them to obtain social approval by conforming to the demands presented by others. In addition, by signaling a problematic state of the goal achievement, negative activating moods can limit attention scope and lead people to selectively process information closely related to the focal issue (Fredrickson & Branigan, 2005; Rowe et al., 2007). Negative activating moods also confine attention to the given issue, further decreasing the possibility of discovering new problems (Fredrickson & Branigan, 2005). Although individuals in negative activating moods selectively attend to information that is closely related to the impending problem and thus are unlikely to discover new problems, they still persist in identifying solutions to fix the problem within the domain as specified and requested by others (De Dreu et al., 2008).

*Hypothesis 2: Negative activating moods are positively related to responsive creativity.*

Although the experience of activating moods of different valence is expected to increase different types of creativity, the experience of deactivating moods is likely to decrease creativity regardless of the valence. People exert additional efforts on tasks when they are feeling activated regardless of the valence because deactivating moods lead to inactivity and disengagement from the environment (Seo, Bartunek, & Barrett, 2010). Only activating moods can enhance the capacity for holding temporary information and activate the cognitive

resources needed for creativity (Brehm, 1999). Creativity is a highly effortful process that necessitates people to engage in an environment (To et al., 2012). To be creative, employees should apprehend the embedded contexts, understand the problem either specified by others or discovered by them, and generate novel ideas to solve the problem. The experience of deactivating moods, positive or negative (e.g., being relaxed or depressed), may detach employees from the reality and make them distracted or even indifferent from the ongoing situations and problems, thereby diminishing both proactive and responsive creativity.

*Hypothesis 3: Deactivating moods are negatively related to proactive and responsive creativity regardless of valence.*

### **Mediating role of ambiguity tolerance**

In contrast to the participants of laboratory experiments who individually work on creative tasks (e.g., Isen et al., 1987; Kaufmann & Vosburg, 1997), employees in organizations exhibit creativity while interacting with their colleagues. Employees are influenced by others' opinion, subject to group norms, and exposed to information provided by their colleagues – all of which can influence creative performance (Hennessey & Amabile, 2010). Thus, both cognitive and social processes should be considered to understand how creativity is manifested in organizations. Ambiguity tolerance (cognitive process) and team identification (social process) are proposed as the mechanisms that explain how the experience of varying mood states shapes employee creativity.

Ambiguity tolerance refers to “the tendency to perceive ambiguous situations as desirable” (Budner, 1962, p. 29). Individuals perceive the situation to be ambiguous when they do not have sufficient information about an issue and thus find estimating the future states difficult (McLain, 2009). Moods can shift individuals' ambiguity tolerance level by changing the expected outcome of uncertain and complex situations. Individuals who experience positive activating moods become optimistic and evaluate ambiguous issues as a controllable and potentially beneficial opportunity (Segerstrom, Taylor, Kemeny, & Fahey, 1998). By contrast, individuals in negative activating moods may expect ambiguous tasks to result in failures than successes, thus becoming avoidant of ambiguity (Mittal & Ross, 1998).

Once shaped by mood states, the level of ambiguity tolerance can change the types of tasks in which employees engage and their cognitive approaches.

Employees with high ambiguity tolerance can be attracted to unfamiliar and complex tasks, which may become fruitful. At workplace, employees may hesitate suggesting new ideas out of fear of rejection (Grant, Parker, & Collins, 2009). Colleagues who are satisfied with the status quo can perceive employees who proactively suggest new ideas as disturbing and thus reject new ideas. However, employees with high ambiguity tolerance level can overcome the fear of rejection and readily produce new ideas because they anticipate that their new ideas would result in favorable outcomes.

*Hypothesis 4: Ambiguity tolerance mediates the positive relationship between positive activating moods and proactive creativity.*

Employees, who experience negative activating moods and thus become avoidant of ambiguity, can be drawn to the problems specified by others. Employees with low ambiguity tolerance level would not search for new problems because they expect unfamiliar issues to result in unfavorable outcomes. Instead, they would prefer tasks specified by others because many aspects of ambiguity have been already eliminated during the specification processes. For example, the nature of a problem, the criteria for appropriate solutions, the expected duration, and the required knowledge and skills are outlined during task specification (Lubart, 2001). Employees with low ambiguity tolerance level would also want to avoid uncertain situations that might emerge if they fail to accomplish managerial directions and fulfill given challenges. Thus, by urging employees to persistently work on a given task challenges and demands, a low ambiguity tolerance level would help employees produce creative ideas responsively.

*Hypothesis 5: Ambiguity tolerance mediates the positive relationship between negative activating moods and responsive creativity.*

### **Mediating role of team identification**

Group identification refers to the degree to which group members link their group membership to their self-concept (Riketta, 2005). Mood experiences in the workplace can change how employees perceive their team, which then affect how closely they identify with their team. People selectively observe and remember others' behaviors, which are congruent with their own mood states (Forgas & Bower, 1987). Employees with positive moods focus on the positive aspects of their team, and they also feel proud to belong to their group and define their self-concept based on membership (Dutton, Dukerich, & Harquail, 1994). By contrast,

the unfavorable images of the team driven by negative moods result in employees' disengagement of their self-concept from the group, thereby reducing team identification (Dukerich, Golden, & Shortell, 2002).

Employees with strong team identification readily accept team goals, attempt to contribute beyond their assigned task, and become altruistic toward others (Dukerich et al., 2002; Janssen & Huang, 2008). Prosocial orientation based on strong team identification enables employees to consider diverse issues beyond their individual responsibilities. Prosocial engagement in various team activities can help employees identify new problems around the collective team task (Bechtoldt, De Dreu, Nijstad, & Choi, 2010). Furthermore, a strong team identification enhances job involvement and motivation to perform well (Riketta, 2005; Van Knippenberg, 2000). Thus, employees with strong team identification may actively utilize ideas and information to explore new opportunities and generate creative solutions. In sum, positive activating moods indirectly increase proactive creativity by enhancing team identification that facilitates active engagement in team processes, thereby leading to the discovery of new issues and enabling the combination of a large pool of information.

*Hypothesis 6: Team identification mediates the positive relationship between positive activating moods and proactive creativity.*

Task engagement becomes relatively individualistic when employees separate self-concept from team membership. Employees with weak team identification may reduce the levels of their task involvement and thus focus on their immediate responsibility (Riketta, 2005). These employees may passively engage in the given task rather than actively searching for new problems. Nonetheless, they may still provide ideas when they receive an explicit order to seek creative solutions, as required by their job (De Dreu et al., 2008).

In addition, employees who feel psychologically distant from others within the team can willingly deviate from the established norms and standard procedures, which may promote unconventional ideas (Han & Harms, 2010). In their experimental study, Goncalo and Staw (2006) found that individualistic groups produced more creative ideas in comparison with collectivistic groups when presented with a clear instruction to creatively solve a given problem. Thus, the experience of negative activating moods indirectly enhances responsive creativity by weakening team identification, which urges employees to focus on tasks that they are directly responsible for and to deviate from the standard procedures.

*Hypothesis 7: Team identification mediates the positive relationship between negative activating moods and responsive creativity.*

The overall theoretical model proposed and empirically tested in the present study is summarized in Figure 1.

## Method

### Sample and procedure

Data were collected from managers enrolled in a part-time executive MBA program of a university in Korea. They were drawn from two sources, namely, employees and their team leaders, to reduce the concern regarding common method bias. The surveys were distributed to 582 employees and their leaders in 194 teams. Employees and their leaders responded to different surveys. The survey for employees included measures of moods, ambiguity tolerance, and team identification, recollecting their affective and cognitive states during the past month. The survey for team leaders included measures of proactive and responsive creativity of up to three employees. The participants returned their responses via postal mail without revealing their personal identity.

Among the initial target sample, 330 employees from 110 teams returned the completed surveys (response rate = 56.7%). After matching the responses of the employees with those of their leaders, the data from 292 employees working in 109 teams were verified usable for analysis. The average company tenure of

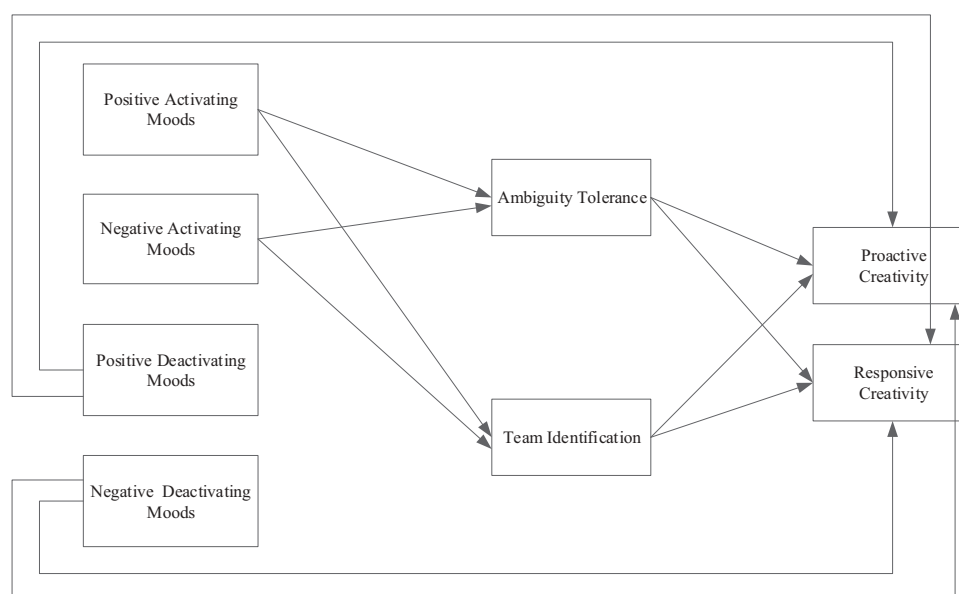
the employees was 8.8 years. Their average age was 36.5 years, and 70.4% were men. The participants had varying education levels, namely, high school diploma (1.4%), two years of college (6.5%), a bachelor's degree (75.2%), a master's degree (15.3%), and a doctoral degree (1.7%). The sample also included employees from various hierarchical positions, including rank-and-file employees (19.3%), associates (25.9%), assistant managers (28.9%), managers (16.0%), senior managers (6.5%), and directors (2.0%). The participants performed diverse functions, including general management and planning (56.8%), sales (17%), research and development (7.5%), manufacturing (5.8%), marketing (5.1%), and others (6.8%).

### Measures

Unless otherwise indicated, all variables were measured using the responses of the participants to the items on a six-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

### Mood at work

Following a circumplex model (Russell, 2003), mood states were classified into four quadrants based on valence and activation. Employees were asked to report their moods at the workplace during the past month using the items adopted from recent studies (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012; To et al., 2012). Positive activating moods were measured using the adjectives "enthusiastic," "excited," "inspired," and



**Figure 1.** Theoretical framework predicting proactive and responsive creativity.

“joyful” ( $\alpha = .87$ ), whereas negative activating moods were measured using the adjectives “anxious,” “nervous,” “tense,” and “angry” ( $\alpha = .87$ ). Positive deactivating moods were measured using the adjectives “at ease,” “calm,” “laidback,” and “relaxed” ( $\alpha = .85$ ), whereas negative deactivating moods were measured using adjectives “dejected,” “depressed,” “despondent,” and “hopeless” ( $\alpha = .93$ ).

### Ambiguity tolerance

Five items ( $\alpha = .74$ ) from McLain (2009) were used to measure the ambiguity tolerance of employees during the past month. McLain’s scale assesses how people respond to five types of ambiguous stimuli, namely, complex, uncertain, unfamiliar, insoluble, and ambiguous stimuli in general terms. One representative item for each of the five stimulus types was employed in this study. The items were slightly modified to ensure their appropriateness in the workplace context. For example, an original item, “I prefer familiar situations to new ones” (reverse-coded) was modified to “During the past month, I preferred new tasks to familiar tasks.” The other four items were as follows (all items were reverse-coded): “I avoided situations that were too complicated for me to easily understand”; “I tried to avoid tasks that didn’t seem to have only one best solution”; “I disliked ambiguous tasks”; and, “I found it hard to make a choice when the outcome was uncertain.”

### Team identification

Items from Mael and Ashforth (1992) were adapted by changing the referent from an organization into a team to measure the identification of employees with their team during the past month ( $\alpha = .76$ ). Among the four original items, only the following were used: (a) “When I talked about my team, I usually said *we* rather than *they*,” (b) “My team’s successes were my successes,” and (c) “When someone criticizes my team, it feels like a personal insult.” One item (i.e., “When someone

praises my team, it feels like a personal compliment”) was excluded because it was similar to but oppositely paraphrased in the third item (item c).

### Proactive and responsive creativity

Team leaders evaluated proactive and responsive creativity of their employees during the past month by using the 10 items validated by Sung et al. (2015). *Proactive creativity* scale included the following five items ( $\alpha = .92$ ): “During the past month, this employee (a) suggested new ways of performing work in a proactive manner, (b) made substantial voluntary and creative contributions in his or her work, (c) was a good source of unexpected creative solutions, (d) suggested creative ideas in an independent and proactive way, and (e) suggested useful ideas and solutions even without a specific problem to solve.” *Responsive creativity* was assessed using the following five items ( $\alpha = .88$ ): “During the past month, this employee (a) exerted acceptable creative efforts as required, (b) came up with creative solutions with guidance, (c) suggested creative solutions when told to do so, (d) responded properly to the demands for creative effort, and (e) suggested new ideas and solutions when presented with a specific problem to solve.”

### Control variables

Following previous studies on the mood–creativity relationship (George & Zhou, 2002, 2007), the current analysis included the following demographic characteristics that can influence creativity as control variables: gender (0 = “male,” 1 = “female”), age (in years), education, organizational rank, and company tenure (in months).

## Results

Confirmatory factor analysis (CFA) was performed to examine the discriminant validity of the variables. The

**Table 1.** Means, standard deviations, and correlations among the study variables.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	.30	.46	–												
2. Education	3.10	.58	.01	–											
3. Age	35.65	6.60	-.25**	.02	–										
4. Rank	2.69	1.26	-.16**	.15**	.82**	–									
5. Company tenure	105.29	83.54	-.07	-.10	.81**	.66**	–								
6. Ambiguity tolerance	3.54	.70	-.13*	.05	.04	.12*	-.01	–							
7. Team identification	4.55	.81	-.16**	.05	.12*	.10	.11	.25**	–						
8. Positive activating moods	3.50	.87	-.06	-.06	-.04	-.02	-.06	.21**	.35**	–					
9. Positive deactivating moods	3.03	.84	-.06	-.12*	-.03	-.01	-.02	-.02	-.04	.28**	–				
10. Negative activating moods	3.17	1.01	.10	.02	.10	.10	.13*	-.21**	-.05	-.18**	-.53**	–			
11. Negative deactivating moods	2.42	1.07	.19**	.00	.03	.03	.09	-.25**	-.14*	-.47**	-.32**	.60**	–		
12. Proactive creativity	3.61	.89	-.13*	.18**	.05	.18**	-.02	.25**	.17*	.13*	.08	-.13*	-.11	–	
13. Responsive creativity	3.62	.90	.03	-.04	-.11	-.20**	-.07	-.12*	-.07	-.08	-.17**	.15*	.15*	-.60**	–

Unit of analysis is individual ( $N = 292$ ).

\*  $p < .05$ ; \*\*  $p < .01$ .

hypothesized eight-factor model indicated a decent fit to the data ( $X^2[499] = 770.35$ ,  $p < .001$ ; CFI = .96, RMSEA = .044). Three theoretically plausible alternative models were compared against the hypothesized eight-factor model. The first alternative model was a seven-factor model that combined proactive and responsive creativity into a single factor ( $X^2[506] = 1172.38$ ,  $p < .001$ ; CFI = .89, RMSEA = .068). The other two measurement models were the two alternative six-factor models that classified mood based only on valence ( $X^2[512] = 1235.45$ ,  $p < .001$ ; CFI = .88, RMSEA = .070) and activation ( $X^2[512] = 1399.32$ ,  $p < .001$ ; CFI = .86, RMSEA = .078). Chi-square difference tests confirmed that the hypothesized eight-factor model outperformed any of the alternative seven- and six-factor models (all  $p < .001$ ). Therefore, the CFA results supported the empirical distinctiveness of the eight study variables. Table 1 provides the descriptive statistics and correlations for the variables.

The current hypotheses were tested using multilevel path analysis, which was run using the scale means of each construct instead of incorporating the observed variables at the item level to create latent factors. This procedure was inevitable because the model included 39 indicators for eight study variables, thereby resulting in the estimation of 741 parameters ( $39 [39 - 1] / 2 = 741$ ) that was considerably larger than the current sample size of 292. Bandalos and Finney (2001) suggested that the number of indicators should be reduced when the sample size is insufficient considering the number of parameters. In this study, one team manager rated the creativity of up to three employees who worked in the same team. Nested data structure was accounted for by allowing random effects at the team level for proactive and responsive creativity ratings (Gong, Cheung, Wang, & Huang, 2012). Mplus version 6.12 (Muthén & Muthén, 2010) was used to conduct a multilevel path analysis while controlling for the interdependence of the nested data.

### **Hypothesized and alternative models**

The effects of five demographic factors on two types of creativity were controlled while testing the hypothesized relationships among the constructs (George & Zhou, 2002, 2007). Preliminary analysis results indicated that only education level and rank of the employees had significant positive effects on proactive creativity, whereas the other effects were all non-significant. Becker (2005) and Spector and Brannick (2011) noted that the relationships among the main study variables can be distorted and the statistical power of the model can be diminished if

non-significant control variables are included in the model. In this study, the overall pattern and statistical significance of the findings remained the same with or without the three non-significant control variables, namely, gender, age, and company tenure of the employees. Therefore, only two meaningful control variables, that is, education level and rank of the employees, were included in the subsequent analyses.

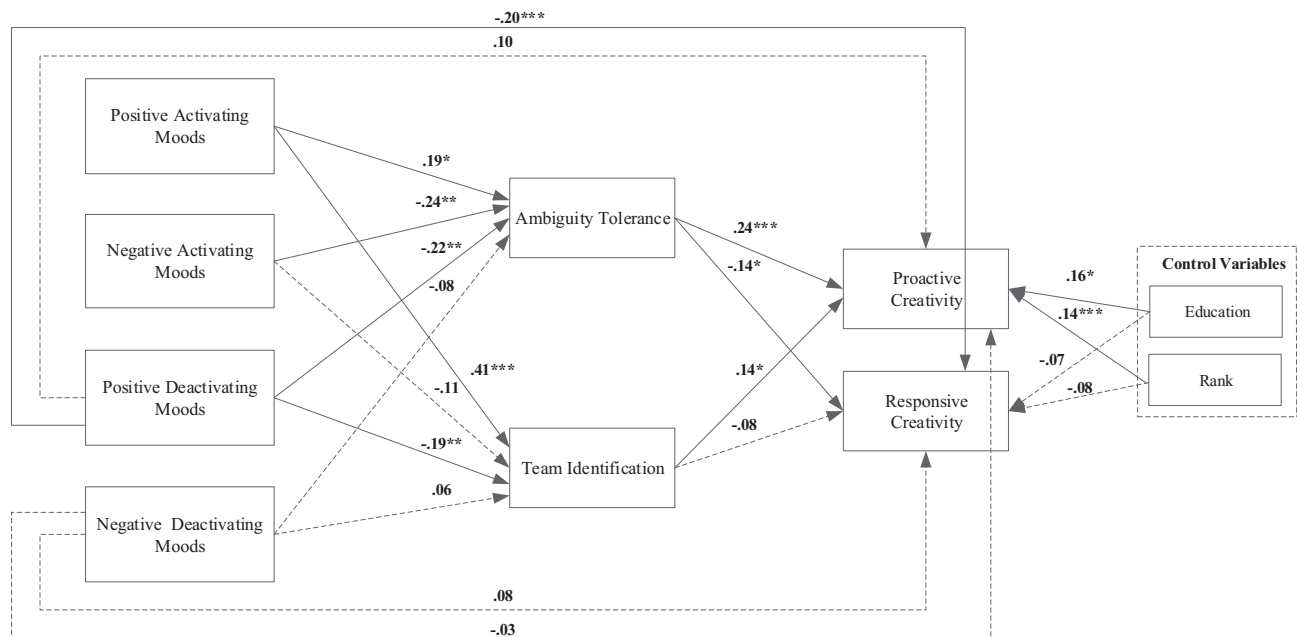
As summarized in Figure 1, a path analytic model that incorporated all hypotheses was tested while the nested data structure was controlled by allowing the team-level random effects for creativity scores. The model fit ( $X^2[14] = 51.08$ ,  $p < .001$ ; CFI = .87, RMSEA = .095, AIC = 2589.28) was only marginally acceptable (Medsker, Williams, & Holahan, 1994). A common practice in path analysis is to check the possibility that theoretically plausible alternative models can better explain the data (MacCallum & Austin, 2000). Accordingly, two alternative models were identified. First, although the full mediation by ambiguity tolerance and team identification was hypothesized, these variables may only partially mediate the relationships between the activating moods and two types of creativity. To test this possibility, four direct paths from positive and negative activating moods to the two creativity types were added. When these four direct paths were added to the hypothesized model, the resulting model fit ( $X^2[10] = 49.91$ ,  $p < .001$ ; CFI = .86, RMSEA = .117, AIC = 2596.42) was not significantly better than that of the hypothesized model ( $\Delta X^2[4] = 1.17$ ,  $p > .10$ ). Therefore, ambiguity tolerance and team identification fully mediated the effects of activating moods on creativity, as hypothesized.

Second, the current framework hypothesized that ambiguity tolerance and team identification mediate the relationships between activating moods and creativity but not deactivating moods and creativity (see Figure 1). Nonetheless, the two mediating variables can explain the latter relationship. This possibility was verified by adding four paths that link two deactivating moods to two mediators. This second alternative structural model indicated a fit ( $X^2[10] = 28.29$ ,  $p < .05$ ; CFI = .94, RMSEA = .079, AIC = 2576.29) that was significantly better than that of the hypothesized model ( $\Delta X^2[4] = 22.79$ ,  $p < .001$ ). Accordingly, this model was adopted as the final structural model as depicted in Figure 2.

### **Hypothesis testing**

Figure 2 and Table 2 summarize the results of the best-fitting model. Hypothesis 1 proposes a positive





**Figure 2.** Final structural model predicting two types of creativity.

$N = 292$ , Non-significant paths are depicted as dotted lines in the diagram. Team level random effects are added in the model. Standardized path coefficients are reported. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 2.** Results of multi-level structural path analysis.

Predictors		Outcomes	
		Proactive Creativity	Responsive Creativity
Positive Activating Moods	Total effects	.10** (Hypothesis 1)	-.06*
	Indirect effects via AT	.05* (Hypothesis 4)	-.03
	Indirect effects via TI	.05* (Hypothesis 6)	-.03
Negative Activating Moods	Total effects	-.07**	.04* (Hypothesis 2)
	Indirect effects via AT	-.06*	.03 (Hypothesis 5)
	Indirect effects via TI	-.01	.01 (Hypothesis 7)
Positive Deactivating Moods	Total effects	.02 (Hypothesis 3)	-.15** (Hypothesis 3)
	Indirect effects via AT	-.05*	.03*
	Indirect effects via TI	-.03*	.02
	Direct path	.10	-.20***
Negative Deactivating Moods	Total effects	-.05 (Hypothesis 3)	.09 (Hypothesis 3)
	Indirect effects via AT	-.02	.01
	Indirect effects via TI	.00	.00
	Direct path	-.03	.08

$N = 292$ . AT = Ambiguity Tolerance; TI = Team Identification. Standardized coefficients are reported. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

association between positive activating moods and proactive creativity. As expected, the total effect of positive activating moods on proactive creativity was significant and positive ( $\beta = .10$ ,  $p = .005$ ), thereby supporting Hypothesis 1. Consistent with Hypothesis 2, the total effect of negative activating moods on responsive creativity was significant and positive ( $\beta = .04$ ,  $p = .03$ ). Hypothesis 3 proposes that positive and negative deactivating moods are negatively related to the two types of creativity. As expected, positive deactivating moods had a significant and negative relationship with responsive creativity ( $\beta = -.15$ ,  $p = .007$ ). Although the total effect of positive deactivating moods on proactive creativity was

insignificant ( $\beta = .02$ ,  $ns$ ), its indirect effects through ambiguity tolerance ( $\beta = -.05$ ,  $p = .02$ ) and team identification ( $\beta = -.03$ ,  $p = .04$ ) were significant and negative. However, negative deactivating moods were unrelated to either proactive or responsive creativity (all  $p > .10$ ). Therefore, Hypothesis 3 was only partially supported.

Supporting Hypothesis 4, positive activating moods had a significant and indirect effect on proactive creativity through ambiguity tolerance ( $\beta = .05$ ,  $p = .03$ ). However, the mediating function of ambiguity tolerance between negative activating moods and responsive creativity (Hypothesis 5) was not fully supported. The indirect effect was only marginally significant although

its direction was positive ( $\beta = .03, p = .07$ ), as expected. Consistent with Hypothesis 6, the indirect effect of positive activating moods on proactive creativity through team identification was significant ( $\beta = .05, p = .02$ ). However, the indirect effect of negative activating moods on responsive creativity through team identification was insignificant ( $\beta = .01, ns.$ ), thereby rejecting Hypothesis 7.

### **Exploratory analysis and robustness check**

An exploratory analysis was conducted to test potential relationships among the workplace moods, two types of creativity, and two mediators, which were not proposed as formal hypotheses. The results are summarized in Table 2. Positive activating moods were negatively related to responsive creativity ( $\beta = -.06, p = .02$ ), though the indirect effects among these variables were insignificant. Negative activating moods had a significant negative relationship with proactive creativity ( $\beta = -.07, p = .008$ ), and this relationship was mediated by ambiguity tolerance ( $\beta = -.06, p = .03$ ) but not by team identification ( $\beta = -.01, ns.$ ).

As a robustness check, the sample was half-split and the same analysis was performed for two subsamples. Although the general patterns were similar to the analysis results based on the full sample, some of the paths became more significant, whereas others became less significant perhaps due to random variations in the two subsamples and diminished statistical power with reduced sample size. In the first subsample ( $N = 147$ ), the direct effect of positive deactivating moods on proactive creativity became significant ( $\beta = .14, p = .05$ ), although the indirect effects via ambiguity tolerance and team identification remained negative. In the second subsample ( $N = 145$ ), the effects of positive and negative activating moods on ambiguity tolerance became insignificant, although their effects involving task identification remained the same. Despite minor differences across two subsamples, the overall empirical patterns were consistent across the full data and the two subsamples.

### **Discussion**

Although recent studies suggest that positive and negative activating moods can increase creativity by their interaction or through different pathways (De Dreu et al., 2008; George & Zhou, 2007), whether the types of creativity that are promoted by moods with opposing valence are the same remains unclear. The probable reason behind the puzzle is that a consolidated, general conceptualization of creativity has been used despite

the increasing awareness that multiple types of creativity may exist (Kaufmann, 2004; Montag et al., 2012; Unsworth, 2001). Additionally, existing studies on the mood–creativity link have focused on the cognitive processes of individuals and have not elaborated how mood states influence creativity when individuals are interacting with others, as in organizational contexts. The present study extends prior research by verifying that different mood states characterized by valence and activation can lead to different types of creativity by influencing the social and cognitive processes of employees.

### **Theoretical implications**

By adopting the distinction between proactive and responsive creativity, this study confirms the empirical distinctiveness of these types of creativity and demonstrates the utility of such classification to clarify the creative processes driven by workplace moods. Current findings indicate that researchers should carefully specify the type of creativity they investigate. The same antecedent variable can predict one type of creativity but not the other, or even hold opposite effects on different types of creativity. Therefore, the seemingly paradoxical findings of previous studies may be consistent. Each study may have investigated different types or forms of creativity.

In the current data, positive activating moods were positively related to proactive creativity, which is consistent with previous findings that positive moods can benefit creativity and proactivity (Amabile, Barsade, Mueller, & Staw, 2005; Bindl et al., 2012; Isen et al., 1987). However, the same moods were also negatively related with responsive creativity. Certain teams may need responsive creativity because of the characteristics of their tasks, environments, and performance strategies. In this case, positive activating moods, which are known for having universal positive consequences, can be detrimental to the team. Thus, identifying the conflicting effects of positive or negative moods is a meaningful endeavor. To develop diverse and ecologically valid perspectives, Lindebaum and Jordan (2012) suggested that the organizational literature should problematize the symmetrical assumption that positive emotions yield positive outcomes, whereas negative emotions produce negative outcomes. The current findings present a potential research direction toward conceptualizing and investigating the asymmetrical effects of positive and negative moods (Kaufmann, 2003).

The experience of negative activating moods was positively related to responsive creativity. This finding enriches the interpretations of previous findings on

a positive association between negative moods and creativity. Gasper (2003) reported that experimental subjects with negative moods engaged in flexible thinking only when they were provided with additional information that the previously provided data may be problematic. By contrast, subjects with positive moods did not wait until they received external information. Instead, they attempted to exercise flexible thinking by following their internal drives. Although people with negative moods can perform creatively, they react to external demands and cues instead of proactively initiating creative processes. George and Zhou (2002) also found that negative moods increased creativity only when the employees perceived a high level of recognition and rewards for creativity. This pattern is consistent with the current finding that negative activating moods were positively related to responsive creativity. Likewise, Montag et al. (2012) suggested that extrinsic motivators will increase employee creativity when expected by organizations. In this sense, the employees in negative activating moods are more responsive to managerial interventions designed to improve individual and team performance than employees in positive moods. Therefore, future studies must consider pros and cons of positive and negative moods in the workplace in a balanced manner.

As expected, positive deactivating moods were negatively related to both proactive and responsive creativity. People who are feeling relaxed may be satisfied with the status quo and lose motivation, thereby becoming noncritical and inert (To et al., 2012). Inactive psychological states drive employees' disengagement with the task and irresponsive to managerial demands for creative performance. Therefore, positive activating and deactivating moods may have opposite effects on proactive creativity. Conversely, negative deactivating moods were not related to the two types of creativity. These contrasting patterns confirm that both the valence and activation of mood should be considered to understand the influence of moods on creative performance (De Dreu et al., 2008).

The analysis showed that ambiguity tolerance mediated the relationships between activating positive and negative moods and the two types of creativity. By contrast, team identification was a significant mediator between positive moods (activating and deactivating) and proactive creativity but not between negative moods and responsive creativity. Therefore, team identification may be more strongly related with prosocial and proactive task engagement, than with passive compliance to a given task. Creativity in organizations can be

characterized as a social, interactive process as much as an individualistic, cognitive process (Mueller & Cronin, 2009). Future research should examine the role of various social perceptions and interpersonal interactions, such as trust, conflict, and knowledge sharing, which may be driven by workplace mood and influence different types of creativity.

### ***Practical implications***

Current findings indicate that proactive and responsive types of creativity have distinctive antecedents. Hence, managers should first understand the type of creativity needed in their organizations and then try to arouse the mood states appropriate for needed creativity. Certain business contexts require proactive creativity of employees, whereas others accrue substantial benefits from responsive creativity. Hence, managers must identify a desirable form of creativity by assessing their task environments and business strategies. If employees voluntarily search for new problems and suggest creative solutions for the problems they discover, then the organization can identify new opportunities and adapt to dynamic business environments (Grant & Ashford, 2008). By contrast, proactive creative attempts by employees can be distracting when the task and environment of the organization are relatively stable and its strategy is geared toward the efficient and reliable completion of the routine process (Chan, 2006; Grant et al., 2009). In this case, managers may want to channel the time and effort of their employees toward addressing the specified problems instead of diverting resources to discover and address problems with unknown value.

Based on the prevailing belief regarding the connection between positivity and creativity (Kaufmann, 2003), managers who want creative performance from their employees can subconsciously encourage their employees to feel positive all the time. However, if their organization requires responsive creativity, then the managers' efforts to promote positive moods may backfire because positive activating and deactivating moods can diminish responsive creativity. Even when proactive creativity is favorable, managers must not encourage positive deactivating moods, which can demotivate and prevent employees from engaging in any form of creative efforts. In sum, managers must understand the desirable type of creativity within their organization or team and then adopt an appropriate mood management scheme.

## Limitations and conclusion

Several limitations should be considered in interpreting the results. First, all variables were collected simultaneously. Although the data were collected from two sources, the current results cannot establish the directionality between workplace moods and creativity. However, previous longitudinal (e.g., Amabile et al., 2005; Bledow et al., 2013; To et al., 2012) and experimental studies (De Dreu et al., 2008; Kaufmann & Vosburg, 1997) showed that the directionality of the effects was from mood to creativity and not the reverse. Future studies may conduct controlled laboratory experiments to establish the causality between mood and creativity. However, proactive creativity that individuals initiate to solve their self-discovered problems may be difficult to observe in laboratory settings in which the creativity tasks are mostly presented by the experimenters (Kaufmann, 2004; Unsworth, 2001).

Second, cultural differences between East Asian and Western countries need to be considered because the data were collected in Korean organizations. In comparison with Western countries, East Asian countries are culturally characterized by collectivism and uncertainty avoidance (Triandis & Gelfand, 1998). Hence, the baseline levels of team identification and ambiguity tolerance in the present sample can be respectively higher and lower in comparison with the data collected in Western cultures. Employees in various cultures may experience different moods to varying degrees. Whereas East Asian people in general prefer positive deactivating moods (e.g., peacefulness, calm) over positive activating moods (e.g., excitement, enthusiasm), Western people highly value positive activating moods (Tsai, 2007). Cultural difference in preferred mood states may shift the baseline levels of employees' mood experience in organizations. In comparison with Western employees, East Asian employees may more frequently experience positive deactivating moods as they pursue such mood state. Future studies should test the possibility of replicating the current findings in other cultural contexts and, if not, how the patterns may shift.

Third, the value and performance implications of proactive and responsive creativity may depend on several contingency factors, such as task characteristics and business environment. Additionally, the effects of various moods on the two types of creativity may depend on numerous individual and contextual factors pertinent to employee creativity, such as creative ability and the characteristics of leaders and coworkers. These boundary conditions that attenuate or strengthen the relationships proposed in this study should be investigated further.

Despite these potential limitations, this study meaningfully contributes to the mood and creativity literature by theorizing and empirically validating distinct effects of various moods on proactive and responsive creativity. The current results are consistent with the existing findings regarding the ambivalent effects of positive and negative moods on creativity (Bledow et al., 2013; De Dreu et al., 2008; George & Zhou, 2007) as well as the importance of the activation dimension in understanding the mood influence on human behavior (Bindl et al., 2012; De Dreu et al., 2008; To et al., 2012). This study also advances the literature by specifying different types of creativity connected to the distinct dimensions of workplace mood (Montag et al., 2012; Unsworth, 2001). The current findings suggest that specifying creative outcomes can be a potential solution to reconcile inconsistent findings involving the predictors of creativity.

## Disclosure statement

The authors attest that there are no conflicts of interest and the data reported here have not been used in any other publications.

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## ORCID

Jin Nam Choi  <http://orcid.org/0000-0001-7890-3195>

## References

- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, 50(3), 367–403. doi:10.2189/asqu.2005.50.3.367
- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin*, 134(6), 779–806. doi:10.1037/a0012815
- Bandalos, D. L., & Finney, S. J. (2001). Item parceling issues in structural equation modeling. In G. A. Marcoulides & R. E. Schumacker (Eds.), *New developments and techniques in structural equation modeling* (pp. 269–296). Mahwah, NJ, USA: Lawrence Erlbaum Associates Publishers.
- Bechtoldt, M. N., De Dreu, C. K., Nijstad, B. A., & Choi, H.-S. (2010). Motivated information processing, social tuning, and group creativity. *Journal of Personality and Social Psychology*, 99(4), 622–637. doi:10.1037/a0019386
- Becker, T. E. (2005). Potential problems in the statistical control of variables in organizational research: A qualitative analysis

- with recommendations. *Organizational Research Methods*, 8 (3), 274–289. doi:10.1177/1094428105278021
- Bindl, U. K., Parker, S. K., Totterdell, P., & Hagger-Johnson, G. (2012). Fuel of the self-starter: How mood relates to proactive goal regulation. *Journal of Applied Psychology*, 97 (1), 134–150. doi:10.1037/a0024368
- Bledow, R., Rosing, K., & Frese, M. (2013). A dynamic perspective on affect and creativity. *Academy of Management Journal*, 56(2), 432–450. doi:10.5465/amj.2010.0894
- Brehm, J. W. (1999). The intensity of emotion. *Personality and Social Psychology Review*, 3(1), 2–22. doi:10.1207/s15327957pspr0301\_1
- Budner, S. (1962). Intolerance of ambiguity as a personality variable. *Journal of Personality*, 30(1), 29–50. doi:10.1111/j.1467-6494.1962.tb02303.x
- Carver, C. S. (2003). Pleasure as a sign you can attend to something else: Placing positive feelings within a general model of affect. *Cognition & Emotion*, 17(2), 241–261. doi:10.1080/02699930302294
- Chan, D. (2006). Interactive effects of situational judgment effectiveness and proactive personality on work perceptions and work outcomes. *Journal of Applied Psychology*, 91(2), 475–481. doi:10.1037/0021-9010.91.2.475
- De Dreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation level in the mood-creativity link: Toward a dual pathway to creativity model. *Journal of Personality and Social Psychology*, 94(5), 739–756. doi:10.1037/0022-3514.94.5.739
- Deci, E., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Boston, MA: Springer Science & Business Media.
- Derryberry, D., & Tucker, D. M. (1994). Motivating the focus of attention. In P. M. Niedenthal & S. Kitayama (Eds.), *The heart's eye: Emotional influences in perception and attention* (pp. 167–196). San Diego, CA, US: Academic Press.
- Dukerich, J. M., Golden, B. R., & Shortell, S. M. (2002). Beauty is in the eye of the beholder: The impact of organizational identification, identity, and image on the cooperative behaviors of physicians. *Administrative Science Quarterly*, 47(3), 507–533. doi:10.2307/3094849
- Dutton, J. E., Dukerich, J. M., & Harquail, C. V. (1994). Organizational images and member identification. *Administrative Science Quarterly*, 39(2), 239–263. doi:10.2307/2393235
- Forgas, J. P., & Bower, G. H. (1987). Mood effects on person-perception judgments. *Journal of Personality and Social Psychology*, 53(1), 53–60. doi:10.1037/0022-3514.53.1.53
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition & Emotion*, 19(3), 313–332. doi:10.1080/02699930441000238
- Frijda, N. H. (1993). Moods, emotion episodes, and emotions. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (pp. 381–403). New York, NY, US: Guilford Press.
- Gasper, K. (2003). When necessity is the mother of invention: Mood and problem solving. *Journal of Experimental Social Psychology*, 39(3), 248–262. doi:10.1016/S0022-1031(03)00023-4
- George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology*, 87(4), 687–697. doi:10.1037/0021-9010.87.4.687
- George, J. M., & Zhou, J. (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management Journal*, 50(3), 605–622. doi:10.5465/amj.2007.25525934
- Goncalo, J. A., & Staw, B. M. (2006). Individualism–collectivism and group creativity. *Organizational Behavior and Human Decision Processes*, 100(1), 96–109. doi:10.1016/j.obhdp.2005.11.003
- Gong, Y., Cheung, S.-Y., Wang, M., & Huang, J.-C. (2012). Unfolding the proactive process for creativity integration of the employee proactivity, information exchange, and psychological safety perspectives. *Journal of Management*, 38(5), 1611–1633. doi:10.1177/0149206310380250
- Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, 28, 3–34. doi:10.1016/j.riob.2008.04.002
- Grant, A. M., Parker, S., & Collins, C. (2009). Getting credit for proactive behavior: Supervisor reactions depend on what you value and how you feel. *Personnel Psychology*, 62(1), 31–55. doi:10.1111/j.1744-6570.2008.01128.x
- Han, G., & Harms, P. D. (2010). Team identification, trust and conflict: A mediation model. *International Journal of Conflict Management*, 21, 20–43. doi:10.1108/10444061011016614
- Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology*, 61(1), 569–598. doi:10.1146/annurev.psych.093008.100416
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology*, 52(6), 1122–1131. doi:10.1037/0022-3514.52.6.1122
- Izard, C. E. (1993). Organizational and motivational functions of discrete emotions. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 631–641). New York : Guilford Press.
- Janssen, O., & Huang, X. (2008). Us and me: Team identification and individual differentiation as complementary drivers of team members' citizenship and creative behaviors. *Journal of Management*, 34(1), 69–88. doi:10.1177/0149206307309263
- Kaufmann, G. (2003). Expanding the mood-creativity equation. *Creativity Research Journal*, 15, 131–135.
- Kaufmann, G. (2004). Two kinds of creativity—but which ones? *Creativity and Innovation Management*, 13(3), 154–165. doi:10.1111/j.0963-1690.2004.00305.x
- Kaufmann, G., & Vosburg, S. K. (1997). “Paradoxical” mood effects on creative problem-solving. *Cognition and Emotion*, 11(2), 151–170. doi:10.1080/026999397379971
- Lindebaum, D., & Jordan, P. J. (2012). Positive emotions, negative emotions, or utility of discrete emotions? *Journal of Organizational Behavior*, 33(7), 1027–1030. doi:10.1002/job.1819
- Lubart, T. I. (2001). Models of the creative process: Past, present and future. *Creativity Research Journal*, 13(3–4), 295–308. doi:10.1207/S15326934CRJ1334\_07
- Luszczynska, A., Gutiérrez-Doña, B., & Schwarzer, R. (2005). General self-efficacy in various domains of human functioning: Evidence from five countries. *International Journal of Psychology*, 40(2), 80–89. doi:10.1080/00207590444000041

- MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology*, 51(1), 201–226. doi:10.1146/annurev.psych.51.1.201
- Mael, F., & Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior*, 13(2), 103–123. doi:10.1002/job.4030130202
- Marks, I. M., & Nesse, R. M. (1994). Fear and fitness: An evolutionary analysis of anxiety disorders. *Ethology & Sociobiology*, 15(5–6), 247–261. doi:10.1016/0162-3095(94)90002-7
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52(1), 397–422. doi:10.1146/annurev.psych.52.1.397
- McLain, D. L. (2009). Evidence of the properties of an ambiguity tolerance measure: The multiple stimulus types ambiguity tolerance scale–II (MSTAT–II). *Psychological Reports*, 105(3), 975–988. doi:10.2466/PRO.105.3.975-988
- Medsker, G. J., Williams, L. J., & Holahan, P. J. (1994). A review of current practices for evaluating causal models in organizational behavior and human resources management research. *Journal of Management*, 20(2), 439–464. doi:10.1177/014920639402000207
- Michael, L. A. H., Hou, S.-T., & Fan, H.-L. (2011). Creative self-efficacy and innovative behavior in a service setting: Optimism as a moderator. *The Journal of Creative Behavior*, 45(4), 258–272. doi:10.1002/j.2162-6057.2011.tb01430.x
- Mittal, V., & Ross, W. T. (1998). The impact of positive and negative affect and issue framing on issue interpretation and risk taking. *Organizational Behavior and Human Decision Processes*, 76(3), 298–324. doi:10.1006/obhd.1998.2808
- Montag, T., Maertz, C. P., & Baer, M. (2012). A critical analysis of the workplace creativity criterion space. *Journal of Management*, 38(4), 1362–1386. doi:10.1177/0149206312441835
- Mueller, J. ., & Cronin, M. A. (2009). How relational processes support team creativity. In E. A. Mannix, J. A. Goncalo, & M. A. Neale (Eds.), *Research on managing groups and teams: Vol. 12. Creativity in groups* (pp. 291–310). Bingley, West Yorkshire, England: Emerald Group Publishing Limited.
- Murray, N., Sujan, H., Hirt, E. R., & Sujan, M. (1990). The influence of mood on categorization: A cognitive flexibility interpretation. *Journal of Personality and Social Psychology*, 59(3), 411–425. doi:10.1037/0022-3514.59.3.411
- Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén.
- Nowlis, V., & Nowlis, H. H. (1956). The description and analysis of mood. *Annals of the New York Academy of Sciences*, 65(4), 345–355. doi:10.1111/j.1749-6632.1956.tb49644.x
- Riketta, M. (2005). Organizational identification: A meta-analysis. *Journal of Vocational Behavior*, 66(2), 358–384. doi:10.1016/j.jvb.2004.05.005
- Rowe, G., Hirsh, J. B., & Anderson, A. K. (2007). Positive affect increases the breadth of attentional selection. *Proceedings of the National Academy of Sciences*, 104(1), 383–388. doi:10.1073/pnas.0605198104
- Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39(6), 1161–1178. doi:10.1037/h0077714
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, 110(1), 145–172. doi:10.1037/0033-295X.110.1.145
- Schwarz, N., & Clore, G. L. (1996). Feelings and phenomenal experiences. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 433–465). New York, NY, US: Guilford Press.
- Segerstrom, S. C., Taylor, S. E., Kemeny, M. E., & Fahey, J. L. (1998). Optimism is associated with mood, coping, and immune change in response to stress. *Journal of Personality and Social Psychology*, 74(6), 1646–1655. doi:10.1037/0022-3514.74.6.1646
- Seo, M.-G., Bartunek, J. M., & Barrett, L. F. (2010). The role of affective experience in work motivation: Test of a conceptual model. *Journal of Organizational Behavior*, 31(7), 951–968. doi:10.1002/job.655
- Spector, P. E., & Brannick, M. T. (2011). Methodological urban legends: The misuse of statistical control variables. *Organizational Research Methods*, 14(2), 287–305. doi:10.1177/1094428110369842
- Sung, S. Y., Antefelt, A., & Choi, J. N. (2017). Dual effects of job complexity on proactive and responsive creativity moderating role of employee ambiguity tolerance. *Group & Organization Management*, 42(3), 388–418. doi:10.1177/1059601115619081
- To, M. L., Fisher, C. D., Ashkanasy, N. M., & Rowe, P. A. (2012). Within-person relationships between mood and creativity. *Journal of Applied Psychology*, 97(3), 599–612. doi:10.1037/a0026097
- Triandis, H. C., & Gelfand, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74(1), 118–128. doi:10.1037/0022-3514.74.1.118
- Tsai, J. L. (2007). Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science*, 2(3), 242–259. doi:10.1111/j.1745-6916.2007.00043.x
- Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review*, 26(2), 289–297. doi:10.5465/amr.2001.4378025
- Van Knippenberg, D. (2000). Work motivation and performance: A social identity perspective. *Applied Psychology*, 49(3), 357–371. doi:10.1111/1464-0597.00020