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RESEARCH ARTICLE

Intrinsic motivation and knowledge sharing in the mood–creativity relationship

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Abstract
Although studies have identified a link between employee intrinsic motivation (IM) and creativity and between positive mood and creativity, some of this study has been equivocal and little research has included these variables in an integrative model. Drawing from several theories of IM, we address this gap by proposing that IM is a critical intervening mechanism in the relationship between positive mood and creativity, and team knowledge sharing affects the power of this mechanism. Research on field data from 120 R&D team members in 30 teams found that team-level knowledge sharing moderated the relationship between employees' positive mood and IM, and IM mediated the relationship between employees' positive mood and their creativity. Implications of our findings are discussed.

Key words: Employee creativity; intrinsic motivation; positive mood; team knowledge sharing

Introduction

Employee creativity management is thought to be critical to organizational effectiveness (Lampel & Germain, 2016; Lu, Bartol, Venkataramani, Zheng, & Liu, 2019), and R&D teams, in particular. Although research has accumulated over the last 40 years in several disciplines spanning multiple levels of analysis, the affective, cognitive, and motivational factors related to creativity are in need of research attention (Anderson, Potočnik, & Zhou, 2014). Two factors that have been found to be a critical driver of creativity are intrinsic motivation (IM; Hon, 2012) and positive mood, a general enthusiastic, active state that is not aimed at a certain event or object (Davis, 2009; De Dreu, Nijstad, & Baas, 2011; Watson, Clark, & Tellegen, 1988). However, some of the mood–creativity research has had mixed findings due to differences in methodology, operationalization, and a disregard for intervening variables. In particular, little research has examined the integrative impact of mood and IM on employee creativity, with the exception of experimental study by Isen and Reeve (2005). It is important to determine exactly how mood affects creativity in order to be able to offer managers' suggestions for creating conditions where employee creativity is likely to flourish.

This study addresses this gap by using the tripartite theory of IM (Carbonneau, Vallerand, & Lafrenière, 2012) to explain why IM mediates the relationship between positive mood and creativity, and R&D team knowledge sharing affects the power of this mechanism. The theory identifies three needs related to IM: IM to know (i.e., engaging in an activity to experience pleasure while learning and trying to understand something new), IM toward accomplishment (i.e., engaging in an activity for the pleasure experienced when attempting mastery), and IM toward experience stimulation (i.e., engaging in an activity for feelings of sensory pleasure; Carbonneau,

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Vallerand, and Lafrenière, 2012). The last two IM needs are especially relevant to employee creativity as it involves completing a task (IM toward accomplishment) that may be viewed as a sensory activity (IM toward experience stimulation).

In particular, this paper proposes that positive mood affects employee creativity through IM toward experience stimulation because experiencing pleasure (e.g., enjoying positive life events) should facilitate employee creativity, as people in positive moods are likely to be motivated to engage in tasks such as creativity that offer sensory pleasure. It is also expected that positive mood will influence employee creativity through IM toward accomplishment as it should lead employees to obtain more satisfaction from creative tasks. In addition, this paper proposes that R&D knowledge sharing affects the power of the mediated relationship between positive mood, IM, and creativity. The mediated relationship should be stronger for employees that share knowledge because this should give them satisfaction from being able to pool knowledge and increase their competence (IM toward accomplishment).

This study proposes that IM is a critical intervening mechanism in the relationship between positive mood and creativity, and team knowledge sharing affects the power of this mechanism. Positive mood and team knowledge sharing should improve employee IM through satisfying work experience stimulation needs and work accomplishment needs, which, in turn, enhance creativity.

Theory and hypotheses

IM and employee creativity

IM refers to performing certain activities for inherent satisfaction (Brown, 2007) without expectation of external rewards (Coon & Mitterer, 2010). When employees are intrinsically involved in their work, they dedicate all efforts to challenges they confront, which causes them to exhibit creativity through self-regulation (Kanfer, 1990). IM increases persistence and task engagement (Hon, 2012; Kong, Xu, Zhou, & Yuan, 2019), and facilitates confidence in one's ability to generate creativity (Grant & Berry, 2011; Ryan & Deci, 2000; Tan, Lau, Kung, & Kailsan, 2019). Thus, maintaining and enhancing IM is essential to facilitating employee creativity (Ryan & Deci, 2000).

Needs satisfaction and IM

Several theories are helpful in examining the antecedents of IM. First, the tripartite theory of IM (Carbonneau, Vallerand, & Lafrenière, 2012) suggests that satisfying the needs of accomplishment and stimulation should enhance individuals' IM. Second, cognitive evaluation theory (Ryan & Deci, 2000) suggests that social and environmental factors (e.g., feedback and communications) facilitate IM. One study found that students' IM in physical education was influenced by their perceived competence, perceived autonomy, physical appearance, goal orientation, and social environmental factors such as lesson content, the teacher, classmates, and school athletic facilities (Hassandra, Goudas, & Chroni, 2003). Research in a student sample identified students' perceived competence as an antecedent to IM (Cury, Biddle, Famose, Sarrazin, Durand, & Goudas, 1996). Research in the workplace found that employees' IM was influenced by their proactive personality (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013).

The reason why social and environmental factors are able to influence IM may be further clarified by self-determination theory, which suggests that there are three basic needs that must be satisfied in order for employees to be intrinsically motivated. The first need, competence, is defined as the knowledge that a person has the skills needed to successfully perform a task in a certain context. The second need, autonomy, involves a person's ability to have control related to the task. The third need, relatedness, encompasses individuals' beliefs that they are connected to others (Deci & Ryan, 1985). Thus, it is likely that contextual variables influence IM through the satisfaction of perceived needs. In this study, this paper uses these approaches to suggest that

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positive mood and team knowledge sharing improve employee IM through satisfying work experience stimulation needs and work accomplishment needs (Carbonneau, Vallerand, & Lafrenière, 2012), which, in turn, enhance creativity.

Positive mood, intrinsic motivation, and creativity

Both mood (De Dreu, Nijstad, & Baas, 2011) and IM (Hon, 2012) have been identified as antecedents of creativity. However, some mood–creativity research has had mixed results. A meta-analysis by Davis (2009) demonstrated that the results appear to depend on the type of study (laboratory experiment vs. field study), operationalization of affect (short-term emotion vs. long-term mood), and the lack of moderators and mediators affecting the mood–creativity relationship. Another meta-analysis by Baas, De Dreu, and Nijstad (2008) found that the positive mood–creativity relationship by itself has a fairly small effect size. This suggests that mediators are at play here. The current paper proposes that IM mediates this relationship. The authors argued that the reason why positive moods are associated with greater levels of creativity was because of IM (Baas, De Dreu, & Nijstad, 2008).

However, little research has examined mood and IM in the same creativity model, with the exception of experimental study by Isen and Reeve (2005). This paper hypothesizes that the relationship between positive mood and creativity is indirect, operating through IM. This paper proposes that IM is a mediator, rather than a moderator, in the relationship because it is thought to explain how positive mood is able to affect creativity. IM is a critical intervening mechanism in the relationship between positive mood and creativity because when employees with positive moods are intrinsically motivated to complete their work, they become committed to directing all their efforts to any novel challenges they confront, such as those required in creative work (Kanfer, 1990). In addition, Hon (2012) has suggested that employee creativity is not possible without IM. It appears that certain cognitive skills used by intrinsically motivated people are required in order for employees to generate creative ideas (Hon, 2012). Thus, it seems likely that IM acts as an intervening variable in the relationship between positive mood and creativity.

Drawing from the tripartite theory of IM (Carbonneau, Vallerand, & Lafrenière, 2012), positive mood due to experiencing pleasure (e.g., enjoying positive life experiences) should induce people's IM toward work experience stimulation. This study also expects IM toward accomplishment to be affected by positive mood. Specifically, this paper proposes that positive mood will increase self-determination and lead individuals to derive more satisfaction and direct more effort toward their creative tasks. Previous laboratory research on students found that positive affect, when generated by a non-job-related manipulation, increases the inherent satisfaction people obtain from their work because subjects with positive affect are better able to consider the requirements of the scenario, use their resources, and select the appropriate actions for a situation where work needs to be accomplished (e.g., Isen & Reeve, 2005). Thus, positive affect is thought to increase the inherent satisfaction people get from their work (Erez & Isen, 2002). Without this IM, employee creativity is not possible (Hon, 2012).

This study builds on existing emotion/motivation research (e.g., Isen & Reeve, 2005). First, previous research measured affect rather than mood. Although the terms are often used interchangeably, affect refers to an immediate expression of an emotion directed toward a specific object or event whereas mood refers to a generalized emotion experienced for a long time (Davis, 2009). Thus, mood should be a more robust predictor of a broader range of employee attitudes and behaviors than affect. Second, the researchers induced affect artificially in the laboratory by giving candy to students in a positive affect experimental group. This paper extends this research by examining mood in a more natural way by asking employees about their moods at work. Third, although Isen and Reeve (2005) measured the ability to stay on an uninteresting task as the outcome, this paper focuses on creativity as the outcome.

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Research in the proactivity literature also lends support for the relationship between positive mood and IM. Proactivity has been defined as a 'special type of goal-directed behavior that is self-starting, change-oriented, and participatory' (Bindl & Parker, 2010: 388). Positive mood should affect proactivity because it triggers an approach action tendency and broadens employees' 'momentary action thought repertoire' (Bindl & Parker, 2010: 388), which is essential to proactivity. In turn, proactivity boosts their expectations of success (Seo, Bartunek, & Feldman Barrett, 2010). Den Hartog and Belschak (2007) found that health care employees in a positive mood had higher levels of personal initiative in the workplace. Fritz and Sonnentag (2009) demonstrated that positive mood encourages taking charge behaviors both on the same day and next day. Bindl, Parker, Totterdell, and Hagger-Johnson (2012) found that positive mood was positively related to four parts of proactive goal regulation: envisioning, planning, enacting, and reflecting. Hence positive mood should increase IM toward work experience stimulation and accomplishment (i.e., engaging in an activity for the pleasure experienced when attempting mastery).

Employees' IM should, in turn, boost employee levels of creativity because when employees are intrinsically motivated to complete stimulating work such as creativity, they devote their energy to innovation as a way of engaging their curiosity and focusing on new ideas (Kanfer, 1990). According to self-determination theory, by facilitating confidence, IM leads employees to pursue novel tasks such as generating creativity (Grant & Berry, 2011; Ryan & Deci, 2000). Furthermore, when employees experience positive moods, their IM has even more energy to draw from to direct toward creative tasks.

Hypothesis 1 Employees' intrinsic motivation will mediate the relationship between positive mood and creativity.

The role of team knowledge sharing in the relationship between mood, intrinsic motivation, and creativity in the R&D context

Next, this paper identifies a variable that we propose will affect the power of IM in transmitting the mood effects on creativity: team knowledge sharing, the degree to which team members share information, ideas, knowledge, and experiences (Kessel, Kratzer, & Schultz, 2012). R&D work is knowledge-intensive and aims to solve technical problems in a creative way. It involves the process of combining the aspects of existing knowledge into novel ideas (Nijstad & Stroebe, 2006). Thus, accessing information from team members is a necessary part of creativity (Amabile, Barsade, Mueller, & Staw, 2005; Hon, Bloom, & Crant, 2014; Men, Fong, Luo, Zhong, & Huo, 2019; Tang & Ye, 2015).

Similarly, a meta-analysis in the innovation field identified communication as a key driver of employee innovation because the sharing of knowledge leads to new ideas (Hülsheger, Anderson, & Salgado, 2009). This paper proposes that team knowledge sharing is a moderator, rather than a mediator, in the relationship because it is thought to explain the strength of the positive relationship between positive mood and IM. Although IM alone would be expected to lead employees to generate creative ideas, knowledge sharing should increase the perception of competence toward creative work as employees with access to more knowledge should be better able to integrate different knowledge bases and generate new knowledge.

The tripartite theory of IM (Carbonneau, Vallerand, & Lafrenière, 2012) may be used to explain the relationship between knowledge sharing and IM. IM toward accomplishment refers to engaging in an activity for the satisfaction that comes from trying to accomplish or create something. When group members share knowledge while completing a task, it follows that they derive satisfaction from being able to pool their knowledge, and, thus, increase their competence. As such, team knowledge sharing is thought to boost group members' confidence in their own capabilities (Amabile et al., 2005). Thus, knowledge sharing helps members of

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R&D teams accomplish their work, which should satisfy the need for competence required for IM proposed by self-determination theory (Ryan & Deci, 2000).

This paper proposes that knowledge sharing directs employees' attention toward pooling knowledge with other group members, boosting the effect of IM's mediating effect on creativity. This fits with motivated information processing theory, which suggests that people who are intrinsically motivated and engage in contributing to the group should be more likely to generate creative ideas (Grant & Berry, 2011). In an empirical test of this theory, Grant and Berry (2011) found that perspective taking, the extent to which employees perceive that they take others' perspectives at work, increased the impact of IM on creativity by helping employees to attend to useful and novel ideas. Although the authors did not explicitly measure knowledge sharing, they noted that perspective taking also gives employees access to viewpoints that offer new information. Other researchers have proposed that people who are in a good mood are more likely to be willing to share their knowledge (Krok, 2013).

Taken together, co-workers in a positive mood should be more likely to share knowledge in their creative efforts. According to broaden-and-build theory, team members in positive moods have improved communication (Rhee, 2007). Positive moods facilitate interactions that allow co-workers to develop social bonds (Keltner & Haidt, 1999) and result in more cooperative behaviors (Barsade, 2002). Positive team emotions should create an environment that positively influences knowledge sharing (George & Brief, 1992). As a result, it is expected that team knowledge sharing will moderate the relationship between positive mood and IM. The positive relationship between positive mood and IM should be stronger for those employees whose teams engage in a high degree of knowledge sharing. Thus, this paper proposes that a team's knowledge sharing behaviors generate a context that, when combined with positive moods, should facilitate higher levels of IM and creativity.

Hypothesis 2 When team knowledge sharing is high, the positive effect of intrinsic motivation on the mood–creativity relationship will be higher.

Method

Participants and procedure

Two hundred surveys were provided to team leaders from three national research institutes in the energy, geochemistry, and chemistry fields in China. Team leaders distributed the surveys to team members. Thirty teams completed and returned the packets (60% response rate) – with 120 scientists responding. A total of 74.2% were male; 30% were aged 20–25, 62.5% were 26–35, and 7.5% were 36–45. A total of 8% had a bachelor's degree, 51% had a master's degree, and 41% had a PhD. A total of 28% had fewer than 2 years of work experience, 62% had between 2 and 5 years, 3% had 5–8 years, and 8% had more than 8 years. A total of 47% were a part of a team with fewer than five members, 43% had 5–10 members, and 10% had 10–20 members. Team members completed the measures assessing knowledge sharing, IM, and mood. Thirty leaders evaluated member creativity.

Measures

The measures were adapted from English instruments, using a back translation procedure (Brislin, 1986) to convert to Mandarin Chinese.

Intrinsic motivation

Ten items ($\alpha = .94$; Van Yperen & Hagedoorn, 2003) beginning with 'Why do you do this job?' assessed IM (e.g., 'For the excitement I feel when I am really involved in my job'). The 5-point Likert-type scale ranged from '*strongly disagree*' to '*strongly agree*.'

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Knowledge sharing

Five items ($\alpha = .95$) adapted from Chiu, Hsu, and Wang's (2006) scale assessed knowledge sharing (e.g., 'I share work-relevant knowledge with my team members'). The 5-point Likert-type scale ranged from '*strongly disagree*' to '*strongly agree*.'

Positive mood

The positive mood scale ($\alpha = .91$; Watson, Clark, and Tellegen, 1988) consisted of 10 emotion-related terms. Items assessed how the emotion term described a participant's feeling in the past half-year on a 5-point Likert-type scale ranging from '*very slightly or not at all*' to '*extremely*' (e.g., 'enthusiastic'). The item 'alert' was removed due to not loading onto one factor with the other items.

Creativity

Zhou and George's (2001) 8-item ($\alpha = .81$) scale of leader-reported creativity of team members was used (e.g., 'This team member [name] suggests new ways to achieve goals or objectives'). The 5-point Likert-type scale ranged from '*strongly disagree*' to '*strongly agree*.'

Control variables

In addition, data on age, gender (male = 0, female = 1), team size, education, and work experience were collected to serve as control variables, as they have been shown to affect creativity (Mueller & Kamdar, 2011).

Results

Before conducting the analysis for the two mediation effect models, a confirmatory factor analysis (CFA) and a concept model fit analysis were conducted. The four-factor model included positive mood, IM, knowledge sharing, and creativity. The four-factor model fit the data well ($\chi^2 = 705.79$, CFI = .90, RMSEA = .07). This paper also tested three alternative models: a three-factor model 1 (combining knowledge sharing and IM as one factor), a three-factor model 2 (combining positive mood and IM into one factor), and a one-factor model including all study items. The results showed that the four-factor fit the data better than each of the alternative models and there were significant differences between them ($\Delta\chi^2 = 678.56^{**}$, $\Delta\chi^2 = 717.07^{**}$, $\Delta\chi^2 = 1{,}200.84^{**}$, respectively), supporting the construct distinctiveness of these variables (see Table 1). To test the concept model's validity, structural equations modeling was used. The fit indices of the fully mediated model were superior to those in the partially mediated model ($\chi^2/df = 1.69$; RMSEA = .08; CFI = .90).

Next, the possibility of common method bias was assessed. First, Harman's one-factor test was performed by including all items in a principal components factor analysis (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff, MacKenzie, & Podsakoff, 2012). As each factor explained equal variance, and no one factor accounted for most of the covariance, the data did not indicate evidence of common method bias. Second, the fit indices of a CFA model with a single unmeasured common latent factor were compared with those of a model without the common latent factor (Podsakoff, MacKenzie, & Podsakoff, 2012). If the fit indices of the common latent factor model were significantly better than those of the original model, then a common method bias would be detected. In this study, the fit indices of the model with the common latent factor were not significantly better than those of the original model (see Table 2), providing further evidence that a common method bias did not influence this study's results. Also, the correlation matrix of individual-level variables did not indicate any highly correlated factors. These results, and the fact that the dependent variable was provided by team leaders, suggest that common method bias was not a major concern in this study. Descriptive statistics and correlations are given in Table 3.

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Table 1. Results of confirmatory factor analysis of the measurement models

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$	CFI	RMSEA	TLI	IFI	RFI	RMR	NFI
Four factor model	705.79	433	1.63	–	.90	.07	.90	.91	.76	.06	.80
Three factor model 1	1,384.35	461	3.00	678.56**	.69	.13	.67	.70	.58	.09	.61
Three factor model 2	1,409.55	461	3.06	717.07**	.69	.13	.66	.69	.57	.18	.60
One factor model	1,893.31	464	4.08	1,200.84**	.53	.09	.49	.53	.42	.19	.46

Note. Four factor model: positive mood, IM, knowledge sharing, and creativity. Three factor model 1: combining IM and knowledge sharing. Three factor model 2: combining positive mood and IM. One factor model: all items set to load on one factor.
*$p < .05$, **$p < .01$.

Table 2. Common method bias test

	χ^2/df	CFI	RMSEA	IFI	RFI	RMR	NFI
Measurement model without common method factor	1.63	.90	.07	.91	.76	.06	.80
Measurement model with common method factor	1.44	.93	.06	.93	.78	.05	.82

Table 3. Means, standard deviations, and correlations

	Mean	SD	1	2	3	4
Team variable						
Knowledge sharing	2.93	.99	1			–
Individual variable						
Positive mood	2.76	1.02	–	1	–	
Intrinsic motivation	3.67	.73	–	.55**	1	–
Creativity	3.37	.46	–	.51**	.62**	1

*$p < .05$, **$p < .01$, two-tailed test.

Before analyzing team knowledge sharing, inter-rater agreement and intra-class correlation coefficients (ICCs) were found to be at acceptable levels; thus, it was possible to proceed with the team-level analyses ($r_{wg} = .87$, ICC(1) = .33, ICC(2) = .98).

The data in this study were multilevel in nature, so we used hierarchical linear modeling to test the hypotheses, which permits the examination of individual- and team-level variables in the same model. To test hypothesis 1, we examined models which only involved individual-level variables (see Table 4). Model 1 showed that employee positive mood was positively associated with creativity (β = .185, $p < .001$). Model 2 showed that, after entering IM, positive mood had no significant effect on creativity (β = .066, $p > .05$), and IM was positively associated with creativity (β = .299, $p < .001$). Next, regression analyses with IM as the dependent variable were conducted. Model 3 showed that employee positive mood was positively associated with IM (β = .372, $p < .001$). Thus, hypothesis 1 was supported.

To test hypothesis 2, we controlled for the level-2 team variables (knowledge sharing and interaction term). The effects of positive mood, knowledge sharing, and their interaction term on intrinsic mood were significant (β = .297, $p < .001$; β = .514, $p < .01$; β = .282, $p < .05$) (see Table 4, model 4). Next, to examine the cross-level moderating effect, a multi-level moderated mediation analysis was conducted. The sample was divided into two groups according to whether the moderating variable was high (one standard deviation above the mean) or low (one standard deviation below the mean) (see Table 5). When team knowledge sharing was high, after entering the control variables, employee positive mood was positively associated with IM (β = .19, $p = .01$, 95% confidence interval [CI] = .11 to .48), and IM was positively associated with creativity (β = .29, $p = .01$, 95% CI = .11 to .48). Employees' positive mood had no effect on their creativity (β = −.01, $p = .91$, 95% CI = −.15 to .13). When team knowledge sharing was low, the relationship between employee positive mood and IM was not significant (β = .05, $p = .39$, 95% CI = −1.00 to .27).

Discussion

This study demonstrates that IM is a critical intervening mechanism in the relationship between positive mood and creativity, and team knowledge sharing affects the power of this mechanism.

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Table 4. Hierarchical linear modeling analysis

Variable	Creativity			IM		
	Null model	Model 1	Model 2	Null model	Model 3	Model 4
Intercept	3.371***	3.023***	2.193***	3.669***	3.669***	3.703***
Control variables						
Gender		.111	.103		−.004	−.007
Age		.071	.065		.215	.191
Team size		.028	.047		−.038	.0004
Education background		−.300*	−.244		−.317	−.337
Work experience		.100	.131		−.149	−.217
Level-1						
Positive mood		.185**	.066		.372***	.297***
IM			.299***			
Level-2						
Knowledge sharing						.514**
Positive mood × Knowledge sharing						.282*
Within-group variance	.136	.135	.105	.394	.332	.330
Between-groups variance	.080	.021	.018	.144	.059	.009
χ^2	97.710	43.817	44.864	71.499	46.137	27.593
Model deviance	138.031	128.029	104.759	256.148	231.225	221.274

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 5. Multi-level moderated mediation analysis

Model	Team knowledge sharing Level	P_{MX}	P_{YM}	Direct effect (P_{YX})	Indirect effect ($P_{YM}P_{MX}$)	Total effects $P_{YX} + (P_{YM}P_{MX})$
Positive mood → IM → creativity	Low	.05	.29**	−.01	.01	.00
	High	.19*	.29**	−.01	.06*	.05*

*$p < .05$, **$p < .01$, ***$p < .001$.

These findings have implications for theory and practice. First, previous research has documented the mood–creativity relationship from a cognitive perspective. Studies have found that positive affect leads to greater cognitive flexibility and facilitates creative problem solving (Shalley, Zhou, & Oldham, 2004). Positive mood has been found to be beneficial for creativity

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(Amabile et al., 2005). Most studies have found that positive mood increases creativity through cognitive means, such as leading people to feel less constrained, think flexibly and act in a more generative way (George & Zhou, 2007). However, a meta-analysis (Davis, 2009) indicated that some mood–creativity research has had mixed results due to the type of study (laboratory experiment vs. field study), operationalization of affect (short-term emotion vs. long-term mood), and the presence of moderators and mediators affecting the mood–creativity relationship. This paper responds to this call by identifying a moderator (team knowledge sharing) and mediator (IM) of this relationship in an organizational context.

Another gap in the existing literature is that until recently there has been little attention paid to the influence of positive affect on motivation (with the exception of experimental study by Isen & Reeve, 2005). Although IM is frequently mentioned in creativity research, it is not often directly assessed in empirical tests (Dewett, 2007), or it is addressed mainly in the laboratory with student samples (Grant & Berry, 2011). Furthermore, research has shown ambiguous findings about whether IM boosts creativity (Grant & Berry, 2011). This study helps to clarify the mechanism through which mood affects employee creativity by demonstrating that positive mood influences creativity through IM. This paper found that employees who are experiencing a positive mood should exhibit higher levels of creativity if they are intrinsically motivated.

This paper builds on the existing research by measuring moods in a more natural way by asking employees rather than inducing a mood in a laboratory setting. Davis (2009) suggested that creativity in the workplace is different from that of the laboratory because it involves considerable effort directed at generating real-world ideas. His meta-analysis showed that research in the laboratory was more likely to detect a positive mood–creativity relationship than research in the field. Thus, the findings of the current study offer stronger support for the mood–creativity relationship in the field where multiple creativity performance measures are expected, rather than single ideation tasks generally observed in lab studies. Another way that this paper extends existing creativity research is by measuring creativity with a leader-report rather than a self-report measure. A meta-analysis in the innovation area suggested that such measures are more valid than self-report assessments (Hülsheger, Anderson, & Salgado, 2009).

This paper also builds on cognitive evaluation theory (Ryan & Deci, 2000), self-determination theory (Deci & Ryan, 2004), the tripartite theory of IM (Carbonneau, Vallerand, & Lafrenière, 2012), and the proactivity literature (Bindl & Parker, 2010) to suggest that positive mood enhances employee IM through satisfying work experience stimulation needs and work accomplishment needs (Carbonneau, Vallerand, & Lafrenière, 2012), which, in turn, enhance creativity. The study's findings may also be explained by motivated information processing theory (Kunda, 1990), which suggests that motivations facilitate information processing as people selectively process knowledge that is in keeping with their motivations. As a result, when positive moods heighten their IM, employees' desires to experience work stimulation and accomplishment should trigger them to concentrate on generating new ideas. But, in order to generate the most creative ideas, they must share knowledge.

This study contributes to the existing literature on knowledge sharing. By including it as a moderator in the model, this paper responds to Grant's (2008) call to empirically examine the processes that affect the relationship between IM and creativity. In addition, research in the computer science field has called for research on knowledge sharing that goes beyond laboratory experiments with student samples (Hung, Durcikova, Lai, & Lin, 2011). Previous research suggested that knowledge sharing is important for creativity (Huang, Hsieh, & He, 2014). This paper builds on this by showing that a team's knowledge sharing behaviors generate a context that, when combined with positive moods, should facilitate higher levels of IM and creativity. Previous studies have emphasized cognitive antecedents of IM. This paper extends the existing theories of IM to suggest that team knowledge sharing interacts with positive mood to increase employee IM through satisfying competence and work accomplishment needs (Carbonneau, Vallerand, & Lafrenière, 2012), which, in turn, enhance creativity.

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This study has implications for practice. Given the key role of IM in affecting creativity, supervisors should ensure that their management techniques enhance their employees' IM. For instance, they could include autonomy and challenge in their employees' jobs, and offer opportunities for the sharing of ideas to occur. Third, to the extent that managers can create conditions that enhance the likelihood of employees experiencing positive moods (e.g., encouraging social opportunities, conducting morale surveys, and emphasizing the positive things about the workplace), they can increase the potential for effective creative idea generation.

Limitations

Some caveats should be taken into account in the interpretation of this study's results. First, the cross-sectional design used to test the hypotheses was nonexperimental and, therefore, impeded causal conclusions. Baas, De Dreu, and Nijstad's (2008) meta-analysis found that the effect of positive moods on creativity weakened the longer time spent on a task. The finding of a mood–creativity relationship is in keeping with the notion that positive moods facilitate quick global processing and cognitive flexibility (De Dreu, Nijstad, & Baas, 2011). However, Baas, De Dreu, and Nijstad (2008) found that through continued determination and persistence, subjects in a neutral mood are eventually able to catch up to those creativity levels exhibited by individuals in a positive mood. Future research should incorporate longitudinal designs.

Second, although this paper discussed different kinds of IM (e.g., IM to accomplish, and IM to experience stimulation; Carbonneau, Vallerand, & Lafrenière, 2012), the measure of IM did not distinguish between the types. Future research should empirically examine each component of IM to further clarify the antecedents. Third, as noted earlier, the current study involved team members and their leaders in three national research institutes in the energy, geochemistry, and chemistry fields in China. Thus, the study's findings may not be easily generalizable to other cultures, and future research should examine the study's hypotheses in other countries.

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