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ABSTRACT

As people working in groups might fare better in solving complex problems than those working alone (e.g., Laughlin, Hatch, Silver, & Boh, *Journal of Personality and Social Psychology*, **90**, 2006 and 644), organizations have increasingly assigned creative projects to groups. Group members contribute their collective efforts over time until the creative project has come to fruition. Although mood is identified as an important antecedent to creativity, little is known about the temporal pattern of how group mood enhances or inhibits group creativity, as well as the underpinning group process that explains the mood—creativity link in groups. We set out to address these questions by taking a within-group approach to study the temporal trends of how group mood precedes group creativity and to examine idea contribution equality (ICE) as a mediating group process. We conducted a three-wave longitudinal study among student workgroups tasked to complete a creativity project over a 1-month span. Evidence showed that positive mood is positively associated with concurrent ICE and negative mood is negatively associated with lagged ICE. Furthermore, a mediation model showed that negative mood eventually hampered expert-rated group creative performance by reducing ICE over time. These findings add new knowledge to the temporal mood—creativity relation within the group context.

Keywords: mood, group creativity, temporal pattern, idea contribution equality.

Given its centrality in human life, creativity—the generation of ideas or products that are both novel and useful (Amabile, 1982, 1983)—has been studied from a variety of perspectives. Research has informed us the dispositional, affective, cognitive, motivational, and cultural correlates of individuals' creative capabilities (e.g., Amabile, 1996; Csikszentmihalyi, 1996; Leung, Maddux, Galinsky, & Chiu, 2008; Sawyer, 2006; Simonton, 2003). One extensively studied antecedent of creativity attests to people's relatively long-lived mood states and relatively transient emotions (e.g., Baas, De Dreu, & Nijstad, 2008; Forgas & George, 2001; George & Zhou, 2002). Going beyond individual-level affect and creativity, the current research aims to enrich understanding of the affective basis of group creativity.

Research has investigated the mood-creativity link at the individual level primarily with one-shot experimental or survey design (Grawitch, Munz, & Kramer, 2003; Jordan, Lawrence, & Troth, 2006). Although interventions to boost group performance have received considerable attention, there is relatively little research to understand the mood effects on group performance, including group creativity (e.g., Amabile, Barsade, Mueller, & Staw, 2005; George, 2007). Furthermore, there is even less research that examines the temporal mood effects on group creativity as well as the group processes that account for such temporal effects (for exceptions, see Bledow, Rosing, & Frese, 2013; Knight, 2015).

Grounded in the mood-as-input theoretical framework (Schwarz, 2012; Schwarz & Clore, 1983, 1996), the current research employed the interval-contingent longitudinal study methodology to fill two important gaps. First, we seek to contribute to two research foci in the study of groups. In the group literature, we notice that the study of affect in groups is seen as "a promising front in the affective revolution in organizational behavior" (see also Barsade & Gibson, 2007; Knight, 2015, p. 100) and that the study of the dynamics that groups undergo over time is limited (Cronin, Weingart, & Todorova, 2011). We submit that group affect plays a critical role in driving group processes that produce downstream changes to group performance (see also Barsade & Gibson, 2007; George & Zhou, 2002). To bridge these two research fronts, the

current research aims to understand the affective dynamics in groups by studying the temporal pattern of how group mood influences group creativity over time.

Second, in a recent review, Barsade and Knight (2015) called for more real-time, process-oriented research that employs experience sampling or longitudinal study techniques to capture how affect implicates on group processes and to examine how group affect is causally linked to group outcomes (see also Hareli & Rafaeli, 2008; Kelly & Barsade, 2001; Marks, Mathieu, & Zaccaro, 2001; Walter & Bruch, 2008). The current research does exactly that. We respond to this call by conducting a process-focused, longitudinal study to examine the nuances of how group mood feeds back to influence the group process of idea contribution and in turn group creative outcome. This design also enables us to explore the causal connection between group mood and group creativity.

In this introduction, we first review findings on the relationship between mood and creativity in groups followed by a more focused discussion on the lagged effect of mood on creativity. Second, we outline the general rationale of the mood-as-input model. Third, we introduce equality in idea contribution as a group process. We apply the mood-as-input theory at the group level to explain how idea contribution equality as the mediating group process could transmit the effect of a prior mood state experienced in the group to affect perceived and actual group creativity. Finally, we make predictions about how group mood can lead to concurrent and lagged effects on group creativity through idea contribution equality. Note that in the current study we take the "bottom-up" approach of group affect (Barsade & Gibson, 2012; Kelly & Barsade, 2001) and define group-level mood as the aggregate of individual group members' mood states at a given point in time. Group-level positive mood and negative mood are not opposite ends on a continuum, but can be experienced simultaneously (George & Zhou, 2002, 2007; Watson, Clark, & Tellegen, 1988).

THE MOOD-CREATIVITY LINK IN GROUPS

Despite extensive research on how to boost performance in workgroups, the literature documenting mood effects on group creative performance remains unclear (Amabile et al., 2005; George, 2007; Jordan et al., 2006; Paulus & Nijstad, 2003). Research that theorizes and tests the mood-creativity link at the group level is limited (Grawitch et al., 2003; Oldham & Cummings, 1996; Shalley, Zhou & Oldham, 2004). Yet, it is oftentimes that people work in groups to collectively engage in creative problem solving (Drazin, Glynn, & Kazanjian, 1999; Fisher & Ashkanasy, 2000).

Some research demonstrated a positive relationship between group mood and group creativity. Grawitch et al. (2003) found that when group members were induced to experience positive mood, those groups produced more creative work and demonstrated higher efficiency in idea implementation than did groups whose members were induced to experience either neutral or negative mood. Other studies showed that positive emotions such as enthusiasm in a team setting could invigorate team members with positive energy and foster higher creativity (Barsade, 2002; Kelly & Barsade, 2001).

Other research, however, revealed that negative mood facilitates creativity. A recent study found that negative emotions promote creative process engagement when individuals have high trait learning goal orientation and feel psychologically empowered at work (i.e., having a sense of self-determination, meaning, impact, and competence; To, Fisher, & Ashkanasy, 2015). Although employing an experience sampling technique, this study mainly examined the cross-sectional, but not lagged, relationship between mood and creative process engagement. Another study showed that after receiving a negative mood induction, interacting groups questioned their productivity and corrected their inflated perception on creativity. Consequently, they became more persistent and creative in brainstorming ideas relative to individuals working in noninteracting groups (Jones & Kelly, 2009). Interacting group members in a negative mood state were better able to synergize different knowledge sets and perspectives (Nemeth & Wachtler, 1983). Although these research efforts are important first step to investigate the relationship between group mood and group creativity, findings remain inconclusive (see Jordan et al., 2006). This study sets out to contribute further knowledge on the mood-creativity relationship in groups.

LAGGED EFFECT OF MOOD ON CREATIVITY

As much research on the mood-creativity link was conducted in a one-time setting, an area that remains relatively understudied concerns the temporal pattern of whether mood precedes creativity in a predictable way (Amabile et al., 2005). In a recent paper, To, Fisher, Ashkanasy and Rowe (2012) succinctly summarized the current state of empirical knowledge on the study of mood and creativity: "Most of this research has investigated the effects of induced moods on immediate creative output on laboratory tasks (e.g., Hirt,

Devers, & McCrea, 2008; Isen, 1999a, 1999b; Martin & Stoner, 1996). Fewer studies have examined the relationship between naturally occurring moods and creativity, however, and even fewer have explored short-term fluctuations in mood and creativity over time. To our knowledge, Amabile and colleagues (2005) conducted the only prior study that assessed naturally occurring mood and daily creativity repeatedly over time and within-person" (p. 599). Apparently, it awaits more systematic investigations to further advance theory on the lagged effect of mood on creativity.

In Amabile et al. (2005) study, about 200 employees in seven companies completed daily dairies throughout the entire course or a specific phase of their project (mean duration is 19.04 weeks). Their results supported a positive linear relationship between positive affect and workplace creativity, with further analyses revealing positive affect to predict the next day's creative performance. Also taking a temporal approach, To et al. (2012) utilized experience sampling methodology to obtain momentary reports of mood and creative process engagement from 30 participants, who completed online questionnaires three times per day for 10 working days. They differentiated between positive activating (e.g., excited) and deactivating moods (e.g., calm), and between negative activating (e.g., anxious) and deactivating moods (e.g., fatigued) (see Baas et al., 2008; De Dreu, Baas, & Nijstad, 2008). Consistent with their prediction that activating moods energize and sustain cognitive capacity to enable creativity, they found that both activating (vs. deactivating) positive and negative moods were positively associated with concurrent creative process engagement, whereas only activating negative mood had a positive lagged effect on creative process engagement measured at the next survey period.

Extending these individual-level findings, the present study addresses the lagged effect of group mood on group creativity. Below we explicate how the mood-as-input model can provide the theoretical basis to predict how group mood exhibits concurrent and lagged effects on group process and creative performance. In particular, to enrich the mood-as-input interpretation at the group level, we argue that people rely on moods as evaluative cues about their group dynamics, thus influencing their judgment of group members' efforts in idea contribution.

THE MOOD-AS-INPUT MODEL

According to a meta-analysis on 63 empirical studies (Davis, 2009), general support for the creative benefit of positive mood was found across a broad range of settings, but results also revealed that both positive and negative moods could be conducive for creativity depending on the context in which moods are experienced (see also Ashby, Isen, & Turken, 1999; Forgas, 1995; Hirt, Melton, McDonald, & Harackiewicz, 1996; Leung et al., 2014; Martin & Stoner, 1996). Accordingly, the mood-as-input model provides a viable account to explain why both positive and negative moods facilitate creativity (Clore, Schwarz, & Conway, 1994; Martin & Stoner, 1996; Schwarz & Clore, 2003).

Based on the mood-as-input model, positive mood and negative mood each signal different information that supports creativity in different ways. Specifically, positive mood signals a satisfactory state that cues a positive evaluation of making good progress toward the goal, whereas negative mood cues an unsatisfactory state that calls for focused attention and continued persistence to increase chances of success (George & Zhou, 2002; Martin, Ward, Achee, & Wyer, 1993). When creativity is the goal, mood could signal the degree to which people should cease or sustain efforts to find creative solutions. People use their affective feelings as a subtle cue in evaluating their efforts and hence creative performance.

The mood-as-input model further postulates that the mood effect on creativity is not uniform, but largely context dependent (Bransford & Johnson, 1972; Martin & Stoner, 1996). For example, under the context where participants were instructed to think about the enjoyment of coming up with more creative solutions (i.e., an enjoyment-based rule), positive mood bolstered creativity more than negative mood (Friedman, Förster, & Denzler, 2007; Hirt, Levine, McDonald, Melton, & Martin, 1997; Martin & Stoner, 1996), possibly because it broadens people's mental capacity and flexibility and increases their variety seeking tendency (Fredrickson, 2001). Under the context where participants were instructed to think about whether their effort was sufficient to meet the performance standard (e.g., a performance-based rule), negative mood bolstered more creative generations than positive mood, possibly because it promotes higher perseverance and critical evaluation of their expended effort (George, 2011).

Empirical evidence is supportive of such mood signaling perspective. For example, De Dreu et al. (2008) found that positive activating moods (e.g., happy, elated) are conducive to creativity through promoting flexible, explorative thinking; negative activating moods (e.g., angry, fearful) are conducive to creativity through promoting perseverant effort and systematic thinking. In organizational contexts, George and Zhou

(2007) showed that creativity is the highest when negative and positive moods are both high within a supportive work environment. Concordant with the mood-as-input model, although positive mood facilitates divergent thinking, it also leads to satisficing on less creative ideas. Negative mood compensates by encouraging problem identification and inducing higher dissatisfaction with the status quo, thus contributing to higher creativity. In their research, positive and negative moods are experienced separately over time, rather than conceptualized as an ambivalent feeling (e.g., Fong, 2006).

Other research sheds light on the temporal changes in mood and creativity based on the mood-as-input perspective. Recently, Bledow et al. (2013) theorized and found support for a more nuanced view about "affective shift." When participants sequentially shifted from an experience of negative affect to a later increase in positive affect and a decrease in negative affect, they showed higher creativity as compared to the workdays on which they did not experience such an affective shift (Study 1) or compared to the participants who merely experienced an increase in positive affect through experimental mood induction (Study 2). With negative affect signaling the need for higher effort and persistence (De Dreu et al., 2008; Martin et al., 1993), it affords a narrower attentional focus and more detailed understanding of the task at hand (Baumann & Kuhl, 2002; Spering, Wagener, & Funke, 2005). Therefore, if individuals experience a phase of negative affect that enables persistent processing of information, followed by a subsequent phase of positive affect that enables higher cognitive flexibility, creative outcome is more likely to ensue.

The mood-as-input perspective was also applied to understanding group performance. Group research showed that groups tend to use the midpoint of a project timeline as a milestone for making evaluations about project progress and performance (Gersick, 1988). Extending this earlier finding with the mood-as-input model, Knight (2015) found that when groups use a performance-oriented frame to make progress evaluations at the temporal midpoint, positive mood signals satisfactory progress and inhibits exploratory search over the second half of the project. In contrast, negative mood signals group members to evaluate progress critically, leading to more persistence in exploratory efforts. Together, an accumulating body of research supports the usefulness of the mood-as-input perspective to understand both individual and group creativity.

HYPOTHESIZING CONCURRENT AND LAGGED MOOD EFFECTS ON GROUP CREATIVITY

We draw upon the signaling notion of the mood-as-input model to ground our hypotheses about the concurrent and lagged mood effects on creativity. Notably, our participants were motivated by a performance orientation, with the course context making salient the project requirements, expected outcomes, and evaluation standards (Knight, 2015). Based on Knight's (2015) recent findings, we argue that mood affects group performance because it affects how groups make performance-based evaluations of their progress.

Key to our prediction is a distinction between group members' perception of their creativity and the actual group creativity (i.e., group project grade). We measured perceived creativity at three timepoints in the longitudinal study and had experts rate actual creativity at the end of the group project. We predict that as positive mood signals the making of sufficient progress in the performance-based context (thus promoting *perceived* creativity), group members will withdraw efforts in subsequent creative undertakings (thus eventually hurting *actual* creativity). In contrast, as negative mood signals insufficient progress (thus reducing perceived creativity), group members will devote continual efforts in the creative task (thus eventually promoting actual creativity).

Our hypotheses also concern the *lagged* mood effects on creativity, such that mood will exhibit a downstream, spillover effect on creativity over time. Although it is typically expected that mood effects last until mood states dissipate, recent theorizing such as the "positive group affect spiral" (see Walter & Bruch, 2008) captures the downstream impacts of positive mood on group outcomes unfolding over time (e.g., Barsade & Gibson, 1998; Lindsley, Brass, & Thomas, 1995; Spoor & Kelly, 2004). Other researchers contend that the affective experiences of group members can feed back into the group's mental model to shape their appraisal of future experiences and events (Hareli & Rafaeli, 2008; Kelly & Barsade, 2001; Walter & Bruch, 2008). Consonant with this theorizing, we posit that the information signaled by positive and negative moods offers people an evaluative cue about task progress, which does not dissipate immediately but can perpetuate to cue future perceptions. Together, we formulate the following hypotheses (Figure 1):

> Hypothesis 1a: Positive mood will have a positive (i) concurrent and (ii) lagged effect on perceived creativity; negative mood will have a negative (i) concurrent and (ii) lagged effect on perceived creativity.

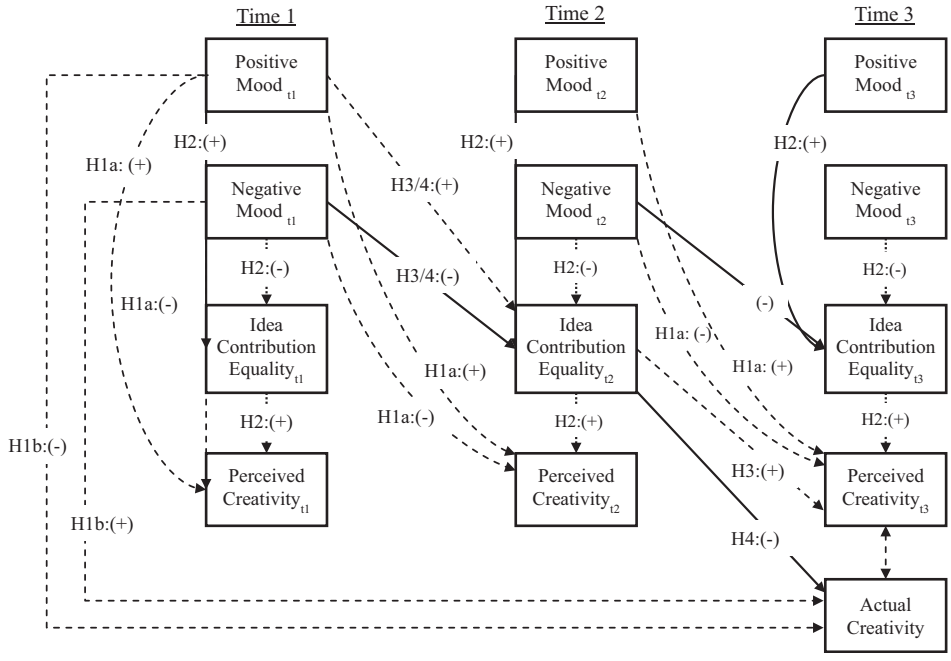

FIGURE 1. Combined schematic representation of Hypotheses 1 through 4. *Note.* The paths represent all hypothesized and tested predictions. (+) and (−) denote hypothesized positive and negative effect of the predictor on the outcome variable, respectively. Solid lines denote significant paths ($p < .05$), whereas dashed lines denote non-significant paths.

Hypothesis 1b: Positive mood will have a negative lagged effect on actual creativity (i.e., expert-rated creativity score of the group project); negative mood will have a positive lagged effect on actual creativity.

Because actual creativity was rated by experts only when the group projects had ended, it is unviable to examine concurrent mood effects on actual creativity. Additionally, we also tested potential reversed lagged effects from creativity to mood to rule out alternative models and strengthen our causal predictions.

EQUALITY IN IDEA CONTRIBUTION AS A GROUP PROCESS

In the prior section, we outlined the major postulates and empirical evidence of the mood-as-input theory to support our hypotheses relating group mood and group creativity. With the mood-as-input framework, we further predict an indirect effect of group mood on group creativity via a group process. Disentangling the impacts of group mood on group processes and outcomes is an important research direction (Barsade & Knight, 2015; Knight, 2015). Clearly, more research is needed to identify the manner in which group mood and group processes are dynamically intertwined to influence group performance (George & Zhou, 2002; Grawitch et al., 2003). In this study, we set out to elucidate positive participation—people's active involvement in group activities (Fleming, 1999; Melcher, 1976; Miller & Monge, 1986)—as one group process that links group mood and group creativity.

Positive participation norms refer to some unwritten rules of group behavior that facilitate active encouragement, involvement, and cooperation in the group to aid task completion (Fleming, 1999). An earlier meta-analytic review by Miller and Monge (1986) demonstrated that participation in group decision-making processes enhances group productivity, particularly when tasks are complex. Group participation provides members a richer base of information to enhance their quality of decision-making, and well-

informed members tend to be more coordinated and effective as executives of those decisions (see also Melcher, 1976). Participation also fosters individuals' ego needs, allowing them to feel a sense of respect, independence, and equality in the team process, thereby boosting their team morale and cooperation (Miller & Monge, 1986). Research has also demonstrated the critical role of group members' participation behaviors in explaining the relation between group mood and group performance. For instance, negative mood was found to increase the likelihood that group members cast doubt on others and withdraw their cooperation (Jones & George, 1998), and that they disengage from helping behaviors (George, 1990). In contrast, positive mood promotes group members' engagement in prosocial help (Chi, Chung, & Tsai, 2011), increases their willingness to create synergy and cohesion with each other (Isen & Baron, 1991), and supports a greater degree of consensus-seeking behaviors (Grawitch et al., 2003), thus enhancing social integration and cooperative work relations (see also Barsade, Ward, Turner, & Sonnenfeld, 2000; Knight & Eisenkraft, 2015). In a group negotiation task, Barsade (2002) showed that positive emotional contagion within groups promotes cooperative distribution of resources and lowers group conflict.

The current research focuses on the positive participation group process wherein group members contribute ideas *equally* (see Webber & Donahue, 2001). We contend that equality in idea contribution is more than simply cooperative or prosocial behaviors. Whereas cooperation is a matter of whether members are generally willing to work together and support each other for mutual benefits (Kelley & Stahelski, 1970), it does not necessarily entail that each member contributes to idea development equally.

Equal participation behavior is particularly essential when group members are required to share and integrate their imperfectly distributed information to solve problems (Campion, Medsker, & Higgs, 1993; Milliken, Bartel, & Kurtzberg, 2003; Stasser & Stewart, 1992; Wageman, 1995). As withholding information or perspective by one or more members is likely to undermine quality of problem solving, it is important for the group to recognize the benefit of exchanging unique expertise by each member for contributing to a diverse knowledge base (Paulus, 2000; Stasser, Stewart, & Wittenbaum, 1995). Therefore, some creativity-enhancing techniques (e.g., nominal group, brainwriting) were found to be effective because they facilitate information sharing through reducing production blocks (Diehl & Stroebe, 1987) or preventing group members from criticizing or giving dominant directions during idea brainstorming (Jackson & Poole, 2003). Interestingly, recent research showed evidence that the group's general collective intelligence factor (the "*c* factor") was positively correlated with equality in distribution of conversational turn-taking, suggesting that groups with members participating equally in idea contribution are more collectively intelligent (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010).

There is some suggestive evidence that mood and equality in idea contribution are related, with positive mood enhancing equal contribution from group members and negative mood hampering it. For example, research showed that negative emotions such as resentment and stress increase tendencies of social loafing and effort reduction in groups (Zhu, 2013), which undermines equal participation among group members. Conversely, when groups show interest in and enjoy group interactions (a positive group affective tone; George, 1990), they fare better in participative problem solving and generation of creative alternatives (Gilson & Shalley, 2004; Shalley, Gilson, & Blum, 2000). Equal participation benefits creativity because group members are receptive to raising and discussing disparate ideas and perspectives (Gilson & Shalley, 2004; Taggar, 2002). Using the interdependent task paradigm, Bramesfeld and Gasper (2008) showed that happy moods broaden group members' focus on the full range of information made available by the sharing of each member, thus promoting higher group performance than sad moods. However, other studies showed that groups working in interdependent tasks that were induced to experience negative (vs. positive) mood performed more adeptly (Kooij-de Bode, Van Knippenberg, & Van Ginkel, 2010; Van Knippenberg, Kooij-de Bode, & van Ginkel, 2010). The researchers attributed the more superior performance of the negative mood groups to their higher levels of information elaboration, possibly because negative mood is conducive to more systematic and critical processing of concrete information (George & Zhou, 2007; Sagiv, Arieli, Goldenberg, & Goldschmidt, 2010).

HYPOTHESIZING CONCURRENT AND LAGGED MOOD EFFECTS ON IDEA CONTRIBUTION EQUALITY

To recap, according to the mood-as-input model, people make evaluations on a given target or situation based on their mood (Martin & Stoner, 1996). A positive (negative) mood leads people to attribute a positive (negative) view on the target (Schwarz, 2012). The target on which any given mood produces its evaluative impact depends on the context within which the mood is experienced (Martin & Stoner, 1996). In the

individual context, personal effort tends to be the salient target of evaluation. Positive mood signals a positive view on personal effort and that good progress has been made; negative mood signals a negative view on personal effort and that greater effort has to be exerted to improve matters (George & Zhou, 2002, 2007). In the group context, group interaction dynamics (as an accessible way to assess group effort) could become the more salient target of evaluation. In this study, we argue that mood will signal important information on the status of the group process of equality in idea contribution, which is highly reflective of the amount of group effort expended on the shared creative goal.

As the group process of equality in idea contribution is deemed an accessible means to assess group effort, we extended the mood-as-input theory to predict the concurrent and lagged effects of group mood on group creativity via idea contribution equality.

Hypothesis 2: Positive (negative) mood has a concurrent indirect positive (negative) effect on perceived creativity via increased (decreased) equality in idea contribution (Figure 1).

Hypothesis 3: Positive (negative) mood at Time 1 has a lagged indirect positive (negative) effect on perceived creativity at Time 3 via increased (decreased) equality in idea contribution at Time 2, where Times 1, 2, and 3 are the three data collection timepoints in the longitudinal study (Figure 1).

Hypothesis 4: Positive (negative) mood at Time 1 has a lagged indirect negative (positive) effect on actual creativity via increased (decreased) equality in idea contribution at Time 2 (Figure 1).

THIS STUDY

We carried out a three-wave interval-contingent longitudinal study on student groups who worked on a creative design course project. Data collection was spread evenly at the beginning, middle, and end of the project. Immediately after the designated group meetings, participants filled out an online survey measuring their naturally occurring mood states, perceived equality in idea contribution, and perceived creativity. We obtained expert ratings of the group creative performance at the end of the project.

With a longitudinal study design, this study tested the lagged mood effects on group creativity with repeated observations. Each wave of the longitudinal study followed right after the designated group discussion. This way participants' responses are likely to be more accurate because they simply access their very recent experiences with minimal recall and aggregation of experiences across time (Robinson & Clore, 2002). Thus, this methodology minimizes memory problems commonly seen in one-shot surveys (Jordan et al., 2006).

By collecting naturally occurring field data, our study advances knowledge on the role of mood in group creativity in three important ways. First, it goes beyond individual-level investigations to study group mood and creativity. Second and more importantly, we join other empirical efforts to address the need of understanding the temporal dynamics that happen within groups in a natural setting. The study of lagged mood effects is particularly relevant to capture how evolving group dynamics bring about consequences on group creativity over time. Third, we enrich the nuances of the mood and creativity literature by examining the group process of equality in idea contribution as a potential mediator that transmits the effect of group mood on group creativity.

PARTICIPANTS AND PROCEDURES

The participants were 276 students (193 males, 83 females; M_{age} = 21.39, SD_{age} = 1.26) from a public university in Tainan, Taiwan who completed the study as part of course requirement. They worked in one of the 34 groups to complete their course project.

Students selected six to nine members to work as a group to develop an innovative product or service together with plans of implementing and running the business. The project commenced in mid-May and ended in mid-June in 2012. Participants had high stakes in the project outcome as it constituted 40% of their final course grade. This provided an ideal context for this study because it made salient the performance orientation of the group project.

Given that we want to preserve the naturally occurring group setting, we did not restrict the number of times the groups should meet (during the whole project duration they met four times on average). However, with an interval-contingent longitudinal design, we designated data collection at the 2-week interval (i.e., first group meeting in mid-May, a meeting in early June, and the last meeting in mid-June). Each wave was

2 weeks apart, as based on Wheeler and Reis's (1991) recommendation a period of 2 weeks provides a stable time window to observe the prevalence or effect of certain events in daily life (e.g., mood states, stressors; see also Chi & Yang, 2015; Dimotakis, Scott, & Koopman, 2011). After the designated meetings, participants were required to complete an online survey, preferably immediately after the meeting or at least on the day of the meeting. Reminders were sent to those who did not complete the survey on the meeting day. The response rate was 95.7%, 98.2%, and 96.3% for each of the three waves, respectively.

MEASURES

Positive and negative moods

Participants completed the 10-item short form of PANAS (Thompson, 2007). The scale includes five positive mood (e.g., "determined" and "inspired;" $\alpha_{\text{Time 1}} = .86$; $\alpha_{\text{Time 2}} = .91$; $\alpha_{\text{Time 3}} = .87$) and five negative mood items (e.g., "nervous" and "upset;" $\alpha_{\text{Time 1}} = .87$; $\alpha_{\text{Time 2}} = .92$; $\alpha_{\text{Time 3}} = .91$) to measure the extent to which they had felt the mood states during the group meeting (1 = *does not apply* to 7 = *applies very much*). Following prior research (e.g., Hirt et al., 2008; Knight, 2015), the mean of each group member's positive mood and negative mood ratings was computed to operationalize group positive mood and group negative mood.

Equality in idea contribution

We measured equality in idea contribution with three items that we developed ("Each member had an equal opportunity to express his/her opinions during group discussions", "Each member had an equal say in the final decision made in the team"; "Decisions in my team were made via agreement among all group members"). Participants indicated their degree of agreement with each statement (1 = *strongly disagree* to 7 = *strongly agree*). The scale's internal consistency ($\alpha_{\text{Time 1}} = .91$; $\alpha_{\text{Time 2}} = .92$; $\alpha_{\text{Time 3}} = .93$) was high across time. The mean of members' individual ratings was used to operationalize perceived equality in idea contribution at the group level.

Perceived creativity

We asked participants to report their perception of creative activities during group discussions by adapting four items from Zhou and George (2001). Sample items are "I often had a fresh approach to problems" and "I suggested new ways to achieve goals or objectives" anchored on a 1 (*definitely untrue*) to 7 (*definitely true*) scale ($\alpha_{\text{Time 1}} = .94$; $\alpha_{\text{Time 2}} = .96$; $\alpha_{\text{Time 3}} = .93$). The mean of members' individual ratings was used to operationalize perceived creativity at the group level.

Actual creative performance

We measured performance outcome of the group project with expert ratings given by the course instructor and another faculty teaching similar courses on creativity. Instead of grading the group project individually, we adopted the consensus-based assessment technique where the two expert evaluators reached consensus through collaboratively deliberating a decision on the creative quality of the project (Hartnett, 2011). The assessments were made by expert judges because they have familiarity and domain knowledge with the project requirements to arrive at a consensual evaluation of the creative work (Amabile, 1982). The project was scored on a 100-point scale.

VALIDITY OF MEASURES

To confirm measurement invariance, confirmatory factor analysis (CFA) and longitudinal factor invariance analyses were performed using MPlus with maximum likelihood estimation. Model fit was assessed by three indices: comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). A satisfactory model would have CFI > .90, RMSEA < .08, SRMR < .08, and standardized indicator loadings >.60 (Bentler, 1990, 2007; Hu & Bentler, 1999; Kenny, 2013).

We first fitted a base model within each of the three waves separately before combining them as the configural invariance model. Each item was loaded on their corresponding latent factor for each time point. As the data involved repeated measures, residuals for the same indicator were allowed to covary across time points (Gerbing & Anderson, 1984; Jöreskog, 1974). The metric invariance model further constrained factor loadings to equality for each item over time. To freely estimate all factor loadings simultaneously, factor variances for the first time point were fixed to one (Yoon & Millsap, 2007). In the scalar invariance model,

all intercepts were freely estimated but constrained to equality over time. For identification, Time 1 factor means and variances were fixed to zero and one, respectively.

We tested each successively constrained model with a chi-square difference test. Invariance is established when constraining particular parameters does not produce a worse model (at $\Delta\chi^2(1) > 3.84$, $p < .05$). To increase rigor, using modification indices (Sörbom, 1989), we checked that further relaxing any parameter did not significantly improve model fit. Our measurement model exhibits full metric invariance but only partial scalar invariance (see Table 1 for fit indices). In particular, two negative affect items (i.e., nervous, scared) had nonequivalent intercepts at Time 3. According to Steenkamp and Baumgartner (1998), the equality of factor loadings accompanied by the equality of at least two intercepts per construct are sufficient for comparison of means across times/groups. As such, our measurement model with partial scalar invariance is adequate for further longitudinal analyses.

We also evaluated the measurement model's reliability and validity by computing composite reliability (CR) based on Joreskog ρ_η and average variance extracted (AVE) based on Joreskog $\rho_{vc(\eta)}$ (see Fornell & Larcker, 1981; equations 10 & 11). A scale is deemed reliable if CR > .70 and AVE > .50, generally indicating that item covariance and variance extracted exceeds measurement error (Bagozzi & Yi, 1988; Fornell & Larcker, 1981). The observed CRs range between .77 and .92, and AVE between .51 and .94. All factor loadings exceeded .60, providing support for structural and convergent validity. The partial scalar invariance model identified meets and exceeds all the above criteria, thus supporting the reliability and validity of our measurement model.

RESULTS

To analyze our variables (mood states, idea contribution equality, perceived creativity) as group phenomena, we aggregated individual-level data into group-level data. This aggregation was based on the additive model that involves a group-level unit representing an average of individual-level measures and allows for differences to exhibit at the lower individual level (Chan, 1998). In other words, the subjects of our measures are individual-level ratings to be averaged to represent the value on the higher group-level variable. Based on the additive model, we do not treat the group-level variables as representing shared perceptions of group mood, idea contribution equality, and creativity within groups, therefore this conceptualization is not based on intra-group individual-level agreements (see Kim, Shin, & Kim, 2013; Wróbel, Królewiak, & Czarna, 2015).

Table 2 presents descriptive statistics of each group-level variable and the correlation matrix. Results revealed that group-level perceived creativity at three time points and actual group creative performance (i.e., group project score) were not correlated with each other, all $|rs| < .11$, all $ps > .10$, suggesting that group-level perceived creativity did not necessarily map onto actual group creativity. Thus, we regarded perceived creativity and actual creativity as two different dependent measures.

ASSOCIATIONS AMONG MOODS, IDEA CONTRIBUTION EQUALITY, AND PERCEIVED CREATIVITY

Given that moods, idea contribution equality, and perceived creativity were measured at three time points, we used *restricted maximum likelihood* (REML) regression analyses to take into account time differences (i.e., using time point as a random effect variable). We also followed To et al. (2012) research to examine the concurrent and lagged effects of the predictors and to control for lagged effects of the dependent variable at Time $t - 1$ for all regression models in order to take into account residual independence across different time points (Ilies & Judge, 2002; Judge & Ilies, 2004). Table 3 presents all REML regression models.

Hypothesis 1a predicted a positive concurrent and lagged effect of positive mood and a negative concurrent and lagged effect of negative mood on perceived creativity. We tested Hypothesis 1a in Model 1. The

TABLE 1. Invariance CFA Fit Indices Presented in Ascending Degree of Measurement Invariance

Model	χ^2	*df*	RMSEA	CFI	SMSR	χ^2 Difference test
Configural	1902.18	1,107	.051	.929	.060	
Metric	1938.82	1,136	.051	.928	.064	$\Delta\chi^2$ (29) = 36.64, p = .16
Partial Scalar	1971.598	1,158	.050	.927	.065	$\Delta\chi^2$ (22) = 32.78, p = .07
Scalar	2010.631	1,162	.051	.924	.065	$\Delta\chi^2$ (4) = 39.03, p < .001

TABLE 2. Means, Standard Deviations, and Correlations of Group-Level Variables

	Mean	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. PM at T1	4.35	0.37												
2. PM at T2	4.63	0.51	.38											
3. PM at T3	4.82	0.48	.40	.70										
4. NM at T1	3.58	0.56	−.28	−.19	−.11									
5. NM at T2	3.61	0.58	−.28	−.24	−.10	.46								
6. NM at T3	3.71	0.54	−.30	−.42	−.13	.23	.57							
7. ICE at T1	5.40	0.50	.50	.38	.34	−.39	−.36	−.44						
8. ICE at T2	5.48	0.51	.37	.75	.57	−.46	−.35	−.50	.56					
9. ICE at T3	5.40	0.45	.55	.63	.79	−.28	−.44	−.39	.39	.63				
10. PC at T1	5.30	0.65	.50	.30	.25	.00	−.35	−.20	.36	.12	.26			
11. PC at T2	5.29	0.64	.49	.23	.17	−.08	−.34	−.15	.31	.08	.20	.97		
12. PC at T3	5.68	0.42	.44	.24	.36	−.31	−.43	−.13	.32	.25	.34	.48	.43	
13. Creativity	78.01	6.79	.22	.35	.07	−.14	−.20	−.20	.31	.41	.22	−.05	−.10	.06

Note. PM/NM at T1/2/3 = Positive Mood/Negative Mood at Time 1/2/3; ICE at T1/2/3 = Idea Contribution Equality at Time 1/2/3; PC at T1/2/3 = Perceived Creativity at Time 1/2/3; Creativity = Actual Group Creativity Rated by Experts. $|r| \geq .38$, $p < .05$; $|r| \geq .44$, $p < .01$; $|r| \geq .55$, $p < .001$.

TABLE 3. Restricted Maximum Likelihood Regression Analyses

Variables	Model 1 DV: PC (Time *t*)	Model 2 DV: ICE (Time *t*)	Model 3 DV: PC (Time *t*)	Model 4 DV: NM (Time *t*)
Controls				
PC (Time *t*−1)	0.58*** (0.08)		0.57*** (0.08)	
ICE (Time *t*−1)		0.21* (0.10)		
NM (Time *t*−1)				0.36** (0.12)
Concurrent Effects				
PM (Time *t*)	0.07 (0.11)	0.65*** (0.08)	0.23 (0.17)	0.18 (0.20)
NM (Time *t*)	0.00 (0.10)	−0.04 (0.07)	−0.01 (0.10)	
ICE (Time *t*)			−0.25 (0.19)	−0.19 (0.22)
Lagged Effects				
PM (Time *t*−1)	0.07 (0.13)	−0.10 (0.10)	0.03 (0.15)	−0.16 (0.18)
NM (Time *t*−1)	−0.07 (0.09)	−0.23*** (0.07)	−0.12 (0.10)	
ICE (Time *t*−1)			0.10 (0.13)	−0.20 (0.17)
Wald Chi-Square	81.57***	167.20***	83.11***	31.71***

Note. PM/NM = Positive Mood/Negative Mood; ICE = Idea Contribution Equality; PC = Perceived Creativity. *$p < .05$; **$p < .01$; ***$p < .001$. All regression coefficients are unstandardized. The numbers in the parentheses represent standard errors.

results were non-significant (all $ps > .10$) for both concurrent and lagged effects, thus disconfirming our Hypothesis 1a.

Next, we tested Hypotheses 2 and 3, which predict an indirect concurrent and lagged positive (negative) relationship between positive (negative) mood and perceived creativity via increased (decreased) idea contribution equality. First, we examined the concurrent and lagged effects of moods on idea contribution equality in Model 2. The results indicated that the concurrent effect of positive mood on idea contribution equality was significantly positive ($B = .65$, $p < .001$) and the lagged effect of negative mood on idea contribution equality was significantly negative ($B = -.23$, $p < .001$). However, neither the concurrent effect of negative mood nor the lagged effect of positive mood on idea contribution equality was significant ($p > .10$). Then, controlling for the effects of moods, in Model 3 we examined the concurrent and lagged effects of idea contribution equality on perceived creativity. We did not find any significant effects (all

ps > .10), thus these findings eliminated the possibility that idea contribution equality could mediate the relationship between moods and perceived creativity. Together, our Hypotheses 2 and 3 pertaining to the indirect concurrent and lagged mood effects on perceived creativity via idea contribution equality were only partially supported, as positive mood had only a concurrent positive effect on idea contribution equality and negative mood had only a lagged negative effect on idea contribution equality without a downstream effect on perceived creativity.

Given the significant lagged effect of negative mood on idea contribution equality, we conducted a reverse effect analysis to examine the effect of idea contribution equality on negative mood in Model 4. The results demonstrated non-significant lagged and concurrent effects of idea contribution equality on negative mood (both *ps* > .10), suggesting that negative mood lowered idea contribution equality but not vice versa.

ASSOCIATIONS AMONG MOODS, IDEA CONTRIBUTION EQUALITY, AND ACTUAL GROUP CREATIVITY

Given that we measured actual group creative performance at the end of the group project, we used the time-lagged method. Specifically, we analyzed positive mood and negative mood at Time 1 as independent variables, idea contribution equality at Time 2 as a mediator variable, and actual group creativity as a dependent variable in ordinary least squares (OLS) regression models. Table 4 presents all OLS regression models.

Hypothesis 1b predicted a negative lagged effect of positive mood and a positive lagged effect of negative mood on actual creativity. As shown in Model 1 of Table 4, results revealed that neither positive mood nor negative mood at Time 1 was significantly related to actual creativity ($p > .10$), thus Hypothesis 1b did not receive support.

We then tested Hypothesis 4 concerning the lagged indirect negative effect of positive mood and lagged indirect positive effect of negative mood on actual creativity via idea contribution equality. Model 2 tested the associations between moods and idea contribution equality. Results showed that Time 1 negative mood ($B = -.35$, $p < .05$), but not positive mood ($p > .10$), was significantly and negatively associated with idea contribution equality at Time 2. Then, Model 3 examined the association between idea contribution equality at Time 2 and actual creativity. Idea contribution equality was significantly and positively associated with actual creativity ($B = 5.52$, $p < .05$). To investigate the indirect relationship between negative mood and actual creativity via idea contribution equality, we used Preacher and Hayes' (2008) bootstrapping method with 5000 repetitions. The findings supported a negative, indirect relationship between negative mood at Time 1 and actual creativity via decreased idea contribution equality at Time 2 ($B = -1.94$, bias-corrected 95% CI [−5.80, −0.29]). This partially confirms Hypothesis 4 because negative mood showed a hypothesized negative lagged effect on idea contribution equality, which in turn led to a negative, but not a hypothesized positive lagged effect on actual creativity.

GENERAL DISCUSSION

To harness brainstorming and idea combination in workgroups (Paulus & Yang, 2000), organizations have increasingly involved groups in creative assignments. Identifying factors that foster or impair group creativity is paramount to creative success in organizations. The creativity literature has identified mood states as one important antecedent to individual creativity, but the extension to group creativity is relatively

TABLE 4. Ordinary Least Squares Regression Analyses

Variables	Model 1 DV: Actual Group Creativity	Model 2 DV: Idea Contribution Equality at Time 2	Model 3 DV: Actual Group Creativity
Positive Mood at Time 1	3.72 (3.35)	0.36 (0.22)	1.71 (3.31)
Negative Mood at Time 1	−0.98 (2.20)	−0.35* (0.15)	0.96 (2.26)
Idea Contribution Equality at Time 2			5.52* (2.57)
R^2 change	.06	.27**	.13*
F change	0.92	5.80**	4.62*

Note. *$p < .05$; **$p < .01$; ***$p < .001$. All regression coefficients are unstandardized. The numbers in the parentheses represent standard error.

understudied. To address this concern, we explored within-group relationship between mood and creativity. Furthermore, we studied the mediating group process of equality in idea contribution and the temporal trends of how group mood precedes group creativity.

In the three-wave longitudinal study, we detected a concurrent relationship between positive group mood and equality in idea contribution, and a lagged relationship between negative group mood and equality in idea contribution. Of import, the finding suggests a mediating relationship: the negative link between negative group mood at Time 1 and actual creativity measured at the end of the group project was mediated by decreased equality in idea contribution at Time 2. In other words, the early experience of negative mood within the group predicted lower levels of idea contribution equality at the temporal midpoint of the group project, which in turn predicted poorer expert evaluated creativity of the project.

CONCURRENT EFFECT OF POSITIVE MOOD AND LAGGED EFFECT OF NEGATIVE MOOD ON IDEA CONTRIBUTION EQUALITY

The current findings support the concurrent facilitating role of positive group mood in equality in idea contribution, but a lagged debilitating role of negative group mood in equality in idea contribution. Based on the mood-as-input perspective, these findings suggest that the evaluative impact of positive group mood on group effort (as reflected in the perception of idea contribution equality) is immediate but that of negative group mood can perpetuate to the next point in time when the group meets. We do not have a good explanation for these findings, but if we were to speculate, this could potentially be explained by the different information positive and negative moods convey and the cognitive styles positive and negative moods induce (Schwarz, 2012). Positive mood signals that the situation is benign, thus facilitating a broad and heuristic thinking style that is conducive for making a quick judgment of participation equality. However, negative mood signals that the situation is problematic, thus facilitating a more careful analysis of the problem at hand. As such, group members might take longer to arrive at a negative judgment of participation equality, thus explaining the manifestation of a lagged negative mood effect. As limited research has empirically tested the lagged effects of group mood on group processes, future research is needed to replicate the differential temporal effects of positive and negative group moods on process variables.

IDEA CONTRIBUTION EQUALITY MEDIATES THE LINK BETWEEN NEGATIVE GROUP MOOD AND ACTUAL CREATIVITY

The current finding revealed that Time 1 negative mood adversely affected actual creative performance via decreasing likelihood of equal idea contribution at Time 2. This suggests that (a) equality in idea contribution could be one mediating mechanism that accounts for the negative relationship between negative group mood and actual group creativity and (b) negative group mood could exert a reinforcing downside effect on the group process and creative outcome at subsequent time periods.

We contend that idea contribution equality serves as a mediator because the equality norm is conducive to the creativity-supporting process of information sharing (Campion et al., 1993; Milliken et al., 2003; Stasser & Stewart, 1992; Wageman, 1995). Information sharing broadens the group's domain-relevant knowledge and fosters cognitive flexibility (Brown & Paulus, 2002), which are some essential conditions for improving creativity. Research also suggested that information sharing is an important precursor to information elaboration and integration, the core group processes identified to stimulate group creativity through exchange, discussion, and integration of disparate ideas and insights (Hoever, van Knippenberg, van Ginkel, & Barkema, 2012). As Webber and Donahue (2001) argued, participation equality could boost creativity because it enables "cognitive elaboration and information exchange within work groups, drawing out the different knowledge and skills represented" (p. 158). Hence, attaining creative success is likely to hinge on exchanging unique expertise among group members (Paulus, 2000; Stasser et al., 1995). Research on the study of representational gaps, a group-level phenomenon that arises when group members hold different perceptual schemata about the group's problem, also suggested that team success requires members to share their highly differentiated, but compatible representations of the problem, thus reducing representational gaps (Cronin & Weingart, 2007). To the extent that equal contribution of ideas results in effective information sharing, group members who adhere to the equality norm are more likely to reap the creative benefits. It follows that if negative mood upsets the equality norm, then the group creative outcome will be adversely affected.

Our finding also aligns with the mood-as-input theorizing that negative mood can cue individuals to evaluate negatively their group efforts in contributing ideas equally during group discussions. This finding is noteworthy for two reasons. First, a parallel effect did not emerge for positive mood. We find it reasonable

to argue that negative mood is a stronger predictor of perceived group efforts than positive mood because group members may exhibit a negativity bias in attending to their negative (vs. positive) affective experiences (Rozin & Royzman, 2001). In other words, negative mood trumps positive mood in group members' diagnosis of group dynamics and interpersonal interactions, thus producing real impacts on group creativity.

Second, as expected, negative emotional experiences could spiral to hamper group creativity over time. The finding that negative mood produced a spillover evaluative impact on group members' participation equality is consistent with prior findings on negative mood's adverse influence on relationship synergy in groups (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Gilson & Shalley, 2004; Shalley, Gilson, & Blum, 2009; Zhu, 2013). However, based on the mood-as-input model we hypothesized that given negative group mood cues an unsatisfactory evaluation of group efforts, as reflected in lower perceived participation equality, it will increase persistence and consequently promote actual group creativity. This hypothesis was not supported. We speculate that the unsatisfactory state of idea contribution cued by negative mood did not increase or had yet to increase perseverance efforts, thus it undermines rather than raises actual creative performance. On the basis of the current finding, we see much promise in future research to contribute to theory advancement by examining the diagnosticity of negative and positive moods in terms of group interaction dynamics, as well as the timeframe of converting task persistence to actual increase in creative performance.

DISCREPANT MOOD EFFECTS ON PERCEIVED CREATIVITY AND ACTUAL CREATIVITY

Our correlation results showed that how participants perceived their creativity and the rated creativity of the group project did not align. More importantly, whereas negative mood adversely affected actual creativity via lowering equality in idea contribution, it did not affect perceived creativity. The divergent results between perceived and actual creativity are consistent with a prior finding by Kurtzberg (2005), which showed that group members' own ratings of their creativity were statistically unrelated to more objective measures of creativity. In fact, an earlier meta-analysis demonstrated that external assessments of performance (e.g., peer and supervisor ratings) might diverge from individuals' own ratings, even though the agreements of the external assessments were high (Harris & Schaubroeck, 1988). In an earlier research by Jones and Kelly (2009), it was found that members of interacting groups corrected their inflated perception on creativity after being experimentally induced to experience negative mood. It is plausible that with naturally occurring negative mood in this study (vs. experimental induction of negative mood in Jones and Kelly's (2009) study), the effect of negative mood might not be uniform on our participants to induce the corrective process that aligns their perception of creativity with the expert rating of creativity. There is much room for future research to gain a richer understanding of how mood plays a role in subjective impression of creative capability and in actual creative production.

LIMITATIONS

One caution to note is that the groups in our study consisted of students and these project groups dissolved upon completion of the task. There may be grounds to ask whether these student participants are representative of members in real-world organizational groups. One potential distinction lies in the liberty for students to elect members that compose the group, whereas this may not be the case for groups in organizations. Therefore, the interpersonal dynamics in the two types of workgroups could differ. In addition, research on cognitive entrenchment has suggested that people can become inflexible when they have acquired high domain-specific expertise, thus hampering their creative problem solving and idea generation (Dane, 2010; Smith, 2003). It is arguable that because student groups have yet to develop strong domain-specific expertise, the influence of cognitive entrenchment on student groups' creativity will be less apparent than that in organizational groups.

Besides these potential differences, we view that student groups could exemplify organizational groups in other aspects. For example, the students were trained in the course to be expert for the task and they were serious and performance-oriented toward the group project, which imposed real consequences on their school grade. Many performance-oriented groups at the workplace are also formed for completing a given project within a limited time frame (e.g., matrix teams). The creative group projects completed in this study have no quantifiable right or wrong solution and would require group members to consider divergent perspectives on the problem. Similarly, broad analyses of a variety of perspectives and approaches are also essential to resolving business-related cases in organizational groups (see Swann, Kwan, Polzer, & Milton,

2003). Furthermore, the current topic of investigation draws on fundamental affective processes to understanding group dynamics and creative thinking, which is deemed to be a largely universal human experience (Diener, Sandvik, & Pavot, 2009; Schwarz & Clore, 2003). In sum, there are sufficient reasons to believe that our student participants would act similarly as those individuals performing in organizational workgroups and our current findings could contribute to useful insights on the mood—creativity link in real-life group settings.

We also recognize that perhaps a more ideal design would be to collect data at more time points over the course of the project in order to get a more nuanced analysis of the concurrent and lagged effects of group mood. However, we acknowledged the participants' time constraint and the fact that they could not conduct discussion meetings more than a few times over the one-month project duration. Thus, we decided to preserve the naturally occurring nature of group interactions by not imposing more meetings on the groups and sampling at three critical time points at the start, the middle, and the end of the group's project life. Relatedly, as the study was conducted in a naturally occurring field context, we did not have video recordings to capture the number of times group members contributed ideas and the duration of their speaking time, which is deemed more viable in a laboratory setting. However, we put a higher emphasis on group members' perception of as opposed to objective equality in idea contribution. Future research could identify whether there is a gap between perceived and actual participation behaviors. Finally, with the consensus-based assessment technique (Hartnett, 2011), the course instructor and another faculty served as expert evaluators to deliberate collaboratively a decision on the creative quality of the project. Notably, as the evaluators shared expertise and domain knowledge of the project requirements, they also shared much consensus in their evaluations. However, we acknowledge that this aspect could be improved by obtaining interrater reliability if we had the experts evaluate the group projects independently.

CONCLUSION

In conclusion, our study has answered to calls for more research on the mood—creativity relationship in groups and on the temporal trends of how group moods unleash their concurrent and lagged effects on group processes and group creativity. As the current research is one of the early empirical attempts to study the temporal patterns of group mood and group creativity, the present preliminary findings await validation in future research. Nevertheless, we believe that the current study has opened up research avenues in the mood and creativity literature by taking a more nuanced analysis to unpack the complex phenomenon that attests to the affective basis of group creativity.

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