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ROLE OF REWARD STRUCTURE OF CREATIVITY AND IDEA FIXATION



ROLE OF REWARD STRUCTURE IN CREATIVITY AND IDEA
FIXATION

BY GOH JIA HAO

MASTERS THESIS IN PART FULFILLMENT OF THE REQUIREMENTS FOR
DEGREE OF MASTER OF SCIENCE IN PSYCHOLOGY PRESENTED TO
SCHOOL OF SOCIAL SCIENCES, SINGAPORE MANAGEMENT UNIVERSITY

2016

ROLE OF REWARD STRUCTURE IN CREATIVITY AND IDEA FIXATION

Role of Reward Structure in Creativity and Idea Fixation

by

Goh Jia Hao

Submitted to School of Social Sciences in partial fulfilment of the requirements for
the Degree of Master of Science in Psychology

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ROLE OF REWARD STRUCTURE IN CREATIVITY AND IDEA FIXATION

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Goh Jia Hao

ABSTRACT

This study seeks to investigate the role of team reward structures, namely the equity and equality of rewards on team idea fixation, as well as its eventual effects on team idea creativity. Through a manipulation of reward structures, distributions of rewards differ across various teams, and this is expected to result in changes in individual motivation to share ideas within teams. Furthermore, due to the role of motivation in team processes, it is expected that team learning and performance goal orientation would moderate the relationship between team rewards structure and team idea fixation. Results shows that teams in the equality condition are more likely to fixate on ideas than teams in the equity condition. A higher degree of fixation in turn leads to a decrease in creativity of the ideas. No significant moderation of the relationship between team rewards and idea fixation is found for team learning and performance goal orientation.

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ACKNOWLEDGEMENT

I would like to thank my supervisor, Assistant Professor Guihyun Park for her patience, guidance, time and support throughout this research project. I would also like to thank my thesis committee members Associate Professor Norman Li and Assistant Professor Tsai Ming Hong for their valuable inputs towards my study. Finally, I would like to thank my family, friends and various research assistants from Singapore Management University for their valuable support and help one way or another that led to the successful completion of this project.

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In today's workplace environment, the widespread of globalization requires the need to stand out in terms of products and services produced by organizations in order to stay competitive. This puts pressure on work demands, making them increasingly focused on effective team decision-making, as well as innovation and creativity within the whole of work teams in the company (Park, & DeShon, 2010). As such, maximizing creativity within teams in the workplace becomes of utmost importance in organizations today. Creativity ideas are generally defined as the combination of two requirements, usefulness and novelty (Amabile, Conti, Koon, Lazenby, & Herron, 1996). However, in the process of generating creative ideas, research suggests that the sharing of ideas and solutions to an prior to the brainstorming disrupts the idea generation of teams, and to a large extent fixate them on a limited scope of ideas (Nijstad, Diehl, & Stroebe, 2003). In these cases, suggestions by teams would revolve around a fixed set of ideas, as a result coming up with ideas that are possibly useful, but not at all novel.

Why this this the case? At the individual-level creativity studies, research suggests that the provision of ideas prior to creative brainstorming triggers our mind to search for associated ideas based on our past experience. In other words, this is a form of cognitive heuristic. When presented with ideas, our minds are programmed to cognitively search for associated ideas saved in our long-term memory to apply them to problems, despite being told to solve these problems creatively (Nijstad, Stroebe, & Lodewijckx, 2002). This results in them generating ideas highly similar or ideas closely associated to the existing ideas that were provided to them. However, the above explanation is still insufficient to account for why some groups are more influenced by fixation than others. For instance, in majority of research and innovation departments of multi-national companies, research ideas are generated

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with reference to past products produced by the companies. Despite that, in some instances, certain companies such as the Apple Inc and Google are able to encourage their employees to avoid fixation, and produce revolutionary ideas different from anything the company has produced before (Fitzsimons, Chartrand, & Fitzsimons, 2008; Girard, 2009). In these companies, one similar defining factor is their emphasis on employee motivation and how that serves as a game-changer in promoting innovation and productivity within their organizations. Research has also shown that motivation plays an integral role in various team processes (Park, Spitzmuller, & DeShon, 2013), and thus it is important to examine if motivation does indeed affect a teams' creativity fixation. This research seeks to explore the role of motivation within teams, with the use of differential rewards systems, to examine how that affects one's creativity and likelihood of fixation on a creativity task. In addition, the role of team level learning and performance goal orientation will also be explored to allow a better understanding of the relationship between different reward structures and creativity.

Rewards in work organizations today

When investigating rewards in organizations, one key area of interest that had been closely studied is the relationship between rewards and the achievement of goals (Bandura, 1977; DeShon, Kowlooski, Schmidt, Milner, & Wiechemann, 2004). It was argued that rewards serves two main purposes. First, to inform individuals on the accuracy and desirability of their actions, and second, to motivate individuals to take action (Schunk, 1990). Rewards serves to inform behaviors through the provision of different levels of reward to different types of behavior. For example, employees in a workplace are able to differentiate the desirable behavior from the undesirable behavior based on the amount of rewards allocated. This provides individuals with a guide for future behavior. Second, rewards motivates through the creation of a desired

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end state. In addition, the anticipation of achieving an eventual outcome results in increased perseverance towards one's end goal. This has been well studied in the early years of research investigating the effects of rewards, showing that rewards promotes motivation and task performance when compared with no rewards (McGraw, 1978; Goyen & Lyle, 1971). Furthermore, following the influence of expansive research on the goal setting theory, where rewarding of specific, challenging goals were found to be more effective compared to vague, easy goals (Locke, & Latham, 1990). As such, almost all organizations of today set various key performance indicators and distribute rewards based on its member's ability to meet specific, yet challenging goals (Locke & Latham, 2006).

Team reward structures are commonly conceptualized as reward interdependence, affecting one's cooperative or competitive tendency during the pursuit of goals (Deutsch, 1949; Deutsch, 1985). Based on this theory, positive team reward independence refers to a state of reward equality, where team member's rewards are equally distributed among team members. In other words, independent of individual performance, team members would all receive the same amount of reward depending on overall team performance. On the other hand, negative reward interdependence refer to a state of reward equity, where team member's rewards are proportionately distributed to individuals depending on their level of performance. As such, team members receives differentiated rewards determined via their performance in the team task. An equality in rewards has been found in previous research to promote a cooperative team environment and more team oriented approach to tasks, but has also been found to limit individual effort and promote groupthink (eg. DeMatteo, Eby & Sundstrom, 1998; Aime, Meyer & Humphrey, 2010). In the case of reward equity, teams are shown to be more motivated by the extrinsic rewards and

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more competitive (Johnson, Hollenbeck, Humphrey, Ilgen, Jundt, & Meyer, 2006), though it is also found that such rewards structure is detrimental towards one's intrinsic motivation (Deci, Koestner & Ryan, 1999). In relation to creativity, rewards has been suggested as one of the determinants that is inter-related to idea generation in teams, suggesting that reward structures affect team's motivation and willingness to think out of the box (Eisenberg, 1999). In this research, these changes in motivations are predicted to likely affect a team's tendency to fixate on ideas during creativity brainstorming.

In a study by Gordon et al. (2000)'s study, 32 3-member teams consisting of college students worked under different reward distributions in a simulation game in which team members interacted to manipulate garbage trucks to collect trash in a city. In the positive reward interdependence condition (ie. equality condition), team rewards was distributed equally. On the other hand, in the negative reward interdependence condition (ie. equity condition), team reward was divided proportionately, with the best performing player receiving proportionately more than the least performing player. Results from the study found that rewards affects a team's goal orientation, leading to differences in team cooperative and competitive perspective towards the tasks given to them. This suggest that team goal orientation potentially interacts with rewards, and plays a role in team motivation as well (Park, Spitzmuller, & DeShon, 2013).

Team goal orientation

Research in goal orientation first emerged in the field of educational psychology during the 1970s and 1980s, expanding from previous research in mastery and performance goals. It was argued by educational psychologists that individuals each possesses a particular orientation towards either learning or performance goals,

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and seeks to apply this concept to the classroom setting. This led to the incorporation of the social cognitive approach in which individuals define themselves based on goals, values and beliefs (Markus, 1977). Two different goal orientations were proposed, namely learning and performance goal orientation. Individuals with *learning goal orientation* approach tasks with the goal of learning for its own sake, while individuals with *performance goal orientations* takes on tasks in an attempt to gain favorable judgments (approach oriented) or avoid negative judgments (avoidance oriented) from others. Furthermore, it was argued that these goals were based on one's individual theory of intelligence (Bandura & Dweck, 1985; Elliot & Dweck, 1988). Incremental theorist, beliefs that intelligence and performance can be improved over time with practice, resulting in them adopting learning goals. Entity theorist on the other hand, assumes that intelligence and performance are fixed, and thus adopts performance goals. The concept was eventually introduced into organizational literature in the 1990s, taking reference to research by Dweck (1986) and was described as a mental framework that determines how individuals interpret and respond to achievement situations (Farr, Hoffman & Ringenbach, 1993; Kanfer, 1990).

The study of goal orientation began aggregating to involve teams at the start of the millennium, investigating the roles of team learning goal orientation, team performance-approach goal orientation and team performance-avoid goal orientation in determining various team outcomes, such as team's performance (Mehta, Feild & Armenakis, 2008; Bunderson & Sutcliffe, 2003), creativity (Hirst, Van Knippenberg & Zhou, 2009; Gong et. al, 2013), feedback seeking behavior (Park, Schmidt, Scheu, & DeShon, 2007) and conflict management (Huang, 2010; LePine, 2005). These teams can take on one of three types of team goal orientation. A team that seeks self-

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actualization and focuses building competence of the team is considered one with a team learning goal orientation. In contrast, a team that seeks high returns and gaining favorable judgments is said to be one with a team-performance goal orientation. Last, a team that seeks to avoid task failures and prevent negative judgments from others is considered to be a team with a team performance-avoid goal orientation (Gong et al, 2013; Bunderson & Sutcliffe, 2003).

However, despite over a decade of research in team goal orientation, the construct of goal orientation in relation to teams is still not clearly understood (DeShon, & Gillespie, 2005; LePine, 2005). In many past studies, team goal orientations were simply deduced from an aggregate of the goal orientations of individual members in the group. This method, though seems most convenient and logical, is potentially flawed as team level goal orientation need not necessarily coincide with individual level goal orientation. In a review paper done on team motivation, it was emphasized that it was important for researchers to note the distinction between individual and team level goal orientation, and that team goal orientation possess unique team level-antecedents (Park, Spitzmuller, & DeShon, 2013). This finding is replicated across many studies, where team goals are influenced not only by individual factors, but other multiple factors as well, that will indirectly change the goal orientation of a team. For example, Mehta, Field, Armenakis, & Mehta (2008) argued that team members form a team goal orientation through various contextual cues, exerting a top-down effect. At the same time, social interaction among team members influences individual team goal orientation, exerting a bottom-down effect. In a separate study, teams with members high in performance goal orientation were shown to be able to display team-learning behaviors. In contrast, teams consisting of individuals high in learning goal orientation were found to show a

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lack of learning behaviors under certain circumstances. This disjunction between individual goal orientation and team goal orientation was found to disrupt overall team performance differently (Hirst, Van Knippenberg & Zhou, 2009). As such, the above past research suggests an incomplete understanding of individual level goal orientation and team level goal orientation and how it affects overall team performance and creativity. Therefore, this research also seeks to explore the differential effects of individual and team level goal orientation in relation to how it affects fixation within teams, as well as the overall creativity within teams.

Purpose of study

This study aims to investigate how differences in reward structures, in particular rewards equality versus rewards equity, results in differences in teams' tendency to fixate on ideas previously presented to them in a creativity idea generation task. In a paper by Park, Spitzmuller and DeShon (2013), a theory of interdependent regulatory dynamics was proposed. The theory posits the interdependence of individual motivations and efforts to team motivation and efforts, which results in the achievement of team goals and team outcomes. For example, in a paper by Bharadwaj and Menon, 2000, in an attempt to understand creativity in organizations, a study is conducted with data from 634 organizations to examine if innovation stems from the individual or from the organization as a whole. The results indicate that in order to encourage innovation, creativity has to be instituted into the entire system as a whole rather to specific sector of the organization as each individual, team, or department are inter-related in influencing the level of creativity in the organization. This study suggests that at the various levels of an organization, changes to one level interact with another level to influence the eventual creativity and innovation within the organization as a whole. This finding also supports the

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theory of interdependent regulatory dynamics, that changes at the individual level interacts with changes at the team level, resulting in variable outcomes. Therefore, by varying the reward distribution of teams, changes in motivation at the individual level to contribute ideas to the team is expected, which in turn changes the overall motivation of the team, leading to team outcomes and goals that differ from one another.

Under the equality condition (positive reward interdependence), team members each receives the same amount of reward regardless of team performance. Such conditions acts as a feedback loop, prompting individuals to experience a reduced motivation to speak up and propose new ideas, as it does not affect their eventual individual rewards (Park, Spitzmuller, & DeShon, 2013). Studies have shown that the primary drive of individuals, despite being in teams is the desire to satisfy their personal needs and to meet their individual goals (Carver, & Scheier, 1998). Past research has also shown that this form of conflict between individual goals and team goals, termed as team asymmetry is extremely prevalent within teams in the workplace, and that individual goals often are the ones that takes precedence over that of team goals (Pearsall, & Venkataramani, 2015). Furthermore, speaking up when there is no need to risks affecting the harmony within teams while not gaining any individual benefits (DeMattio, Eby, & Sundstrom, 1998). Studies have suggested that it is detrimental to the creativity of teams in situations where teams are expected engage in active discussion, but are in contrast with individual goals that does not serve to encourage contribution (Kim, MacDuffie, & Pil, 2010; Chen, & Kanfer, 2006). However, members of a team tend to behave cooperatively and work with the team to complete the task in the most efficient way possible despite being individually motivated. Research suggests that this cooperative behavior arise because team

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members are aware that they will only be able to receive their individual reward if the team performs and completes the task (Pearsall, & Venkataramani, 2015). For instance, one study showed that when teams are rewarded as long as they completed the task, teams often chose the easier task to complete as compared to the challenging task. However, when teams are told that their rewards depends on how well they work as a team, teams are more likely to choose the more challenging task. This behavior indicated that depending on team members' individual motivation, teams select solutions to their task most suited in achieving their objectives (Nickerson, & Zenger, 2004). Thus, under the equality condition, as teams just needs to complete the task well to stand a chance for the individual reward, teams are more likely going to choose to adopt ideas given to them, rather than risk contributing a drastically different idea, which eventually does not possibly increase their individual rewards (Paulus, & Nijstad, 2003).

On the other hand, under the equity condition, individual team member receives rewards depending on the quality of their individual performance. This leads to a different individual motivation, and thus a different feedback loop, encouraging and motivating individuals to voice their opinions, in order to showcase their own ideas and allow them to stand out (Park, Spitzmuller, & DeShon, 2013). This puts team members in a situation where individuals have to outperform one another, and constantly strive to have their ideas accepted as a team idea, as a result generates competition within the team (Pearsall, & Venkataramani, 2015). Team goals are in turn affected by the competition as well as individual motivations, thus resulting individuals striving harder and constantly trying to both generate new ideas during their discussions (Beersma, Hollenbeck, Humphrey, Moon, Conlon, & Ilgen, 2003),

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as a result avoid fixating on ideas given to them. Therefore, the first hypothesis of this research is as follows.

H1: Teams in the equality condition are more likely to generate similar ideas to ideas previously presented to them than teams in the equity conditions.

Creativity is defined as ideas that are both novel and useful (Amabile, Conti, Koon, Lazenby, & Herron, 1996). As such, when teams become fixated on ideas, their ideas are considered less creative. This is so as even though the ideas might still be regarded as useful, but are no longer considered novel due to its similarity to past ideas generated (Mayer, 1999). Furthermore, research has shown that the degree of sharing and idea exchange by members within teams plays a critical role in the generation of creative ideas in teams (Paulus, & Yang, 2000; De Dreu, & West, 2001). For example, in a study with 149 employee teams in an organization, teams that were rated the most creative were teams whose members were constantly voicing out suggestions and feedback to one another within the team (Zhou, & George, 2001). This emphasizes the importance of the role of speaking up in encouraging team creativity in organizations. As seen above, teams in the equality condition are less motivated to share amongst one another, while teams in the equity condition are more motivated to share their ideas due to differing individual motivation (Paulus, & Nijstad, 2003). Therefore, under conditions of greater fixation of ideas predicted in the equality condition, teams are likely to be rated less creative. Similarly, when there is less fixation of ideas as predicted in the equity condition, teams will likely be rated as more creative.

As such, the second and third hypotheses are as shown below.

H2: Teams in equality condition are less likely to be rated as creative than teams in the equity conditions

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H3: Teams that fixate on ideas given to them are likely to be rated less creative than teams that did not fixate on ideas.

In addition, one's individual motivation is found to be a dynamic process within teams, and that it is influenced by multiple other significant factors (Park, Spitzmuller, & DeShon, 2013). As such, it is important to consider other motivational factors shown to affect team creativity as well (Shalley, & Gilson, 2004). One such significant factor affecting one's motivation in teams is the team's learning and performance goal orientation (DeShon, & Gillespie, 2005). In a study conducted across the United States, it was found that teams high in learning behavior were found to be more creative. However, both team learning and performance goal orientations were found to moderate the level of creativity within teams. Specifically, team learning goal orientation attenuate team creativity at high levels of learning behavior, while team performance goal orientation decreases a team's creativity at low levels of learning behavior while increasing team creativity at high levels of learning behavior (Hirst, Van Knippenberg, & Zhou, 2009). In the case of rewards equality, a lack of motivation to share ideas with one another might be moderated by the team's learning goal orientation. Past research has shown that teams with high team learning goal orientation results in greater intrinsic motivation within individuals to perform well for a task (Wolters, Shirley, & Pintrich, 1996). With greater intrinsic motivation, teams are found to be less affected by the motivation of individual reward, but more motivated by the opportunity to learn from the experience (Park, Schmidt, Scheu, & DeShon, 2007). Such learning behaviors are also found to limit one's focus on self-interest and encourage more prosocial behaviors within teams (De Dreu, & Nauta, 2009). This suggests that members of teams that are high in learning goal orientation would likely be willing to share more ideas and suggest new ideas despite a lack of

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individual reward motivation to do so. For instance, it was found that teams high in team learning orientation were motivated intrinsically independent of other motivational factors, and this led to increased creativity within organizational work teams (Gong, Huang, & Farh, 2009). As such, teams with higher learning goal orientation is predicted to reduce the effect of idea fixation, and motivate individuals to share more of their ideas with one another within the team. These increase in sharing by team members will likely lead to an increase in the level of creativity in teams with high learning goal orientation (De Dreu, & West 2001). On the other hand, when a team possesses a high level of team performance goal orientation, research shows that teams becomes highly task oriented (Bunderson & Sutcliffe, 2003), and thus often leads to the team seeking the fastest possible way to complete the task (VandeWalle, Brown, Cron, & Slocum, 1999). Furthermore, team performance goal orientation has been shown to motivate individuals to become highly task focused (Janssen, & Van Yperen, 2004), and seek out the most efficient ways to complete a task (Gong, Huang, & Farh, 2009). In this case, despite being individually motivate to perform well for oneself in the task, it is predicted that teams are likely to adopt ideas from those presented to them as it allows the task to be completed faster and more efficiently when the team is high in team performance goal orientation. As a result, teams are more likely to fixate on ideas rather than coming up with brand new ideas by the team despite having the individual motivation to do so. As such, the following two additional hypotheses are proposed.

H4: The amount of fixation by teams in the equality condition is moderated by team learning goal orientation.

H5: The amount of fixation by teams in the equity condition is moderated by team performance goal orientation.

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Participants

Participants for this study are recruited from a pool of undergraduate students from a public university in Singapore in exchange for either bonus class credit or a cash payment of \$6. In addition, participants are presented with the possibility of an additional cash reward of \$60 given to them at the end of study collection. The study collected from a total of 189 individuals, grouped into teams consisting of 3 individuals each to complete the task. 31 teams were allocated to the equality condition, while 32 teams were allocated to the equity condition. The total sample size as such consist of a total of 63 teams.

Methods

A team task was adapted from a previously well-established group activity, requesting participants to work as a management team member of a theatre named Windy City Theatre (Thompson, & Blornartz, 1996). Within their team consisting of 3 individuals each, members are requested to go through a set of materials, which would allow them to understand their role as a member of the management team. In this task, the 3 members of team were simply named either member 1, 2 or 3. Participants were each given the same information on 3 aspects of theatre management. Participants are given 8 minutes and are required to read and understand information from each of the sub-areas, namely advertising, sales and special events. After reading up and learning about their individual roles, participants are then grouped into their teams of 3 by random assignment.

As a team, participants will be ushered into a discussion room, and will be given some time to introduce oneself, share some personal information about oneself to each other, while at the same time be asked to come up with a team name for their group. This is so as past research has shown that team members need time to first

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familiarize themselves with one another so that they would perceive a sense of team, which is important for the emergence of various team processes (Harrison, Mohammed, McGrath, Florey, & Vanderstoep, 2003). After which, they would be informed of the team task. The task requires them to discuss and formulate a solution plan for a problem that the theatre is facing. Specifically, teams are informed that the theatre is gradually losing its relevance, and teams are required to come up with strategies that would attract the younger audience back to the theatres. They are also informed that they would need to consider all three aspects of theatre management, namely advertising, sales and special events while formulating their decisions.

Equality of rewards and equity of rewards (ie. reward interdependence) is manipulated at this point of the study. The manipulation is adapted from Dang (2004), by varying the amount of cash reward participants would receive at the end of the study. Teams are informed before the start of the final task that if they were to rank among the top 25 percent of all performing teams, they would win an additional cash bonus of \$60 on top of their existing credits or cash they are receiving in the study. Two reward conditions are used. In the equality reward condition, team members were told that the reward would be equally distributed among each team member. In this case, each member would receive \$20 if his or her team won the cash bonus. In the equity reward condition, team members were told that the team reward would be divided differentially. In this case, the top performer of the team would receive \$30; the middle receives \$20; and the bottom performer receives \$10. Participants are also informed in both conditions that their individual performance would be determined via inter-peer rating done at the end of the study. This was done to allow consistency in methods across both conditions.

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After the introduction of the rewards, teams were first presented with two ideas, and are informed that these ideas are solutions generated by teams who had completed the task previously and are there for their reference. The two ideas given to the teams are 1) “Creating increased interaction between celebrities and members of audience” and 2) “Promoting theatre through schools to reach out to a larger group of audiences”. At the end of their discussion, team members are required to summarize, integrate and propose their ideas in the form of an integrated team plan within their given booklet. The participants are then asked to answer a series of questions, including rating of their peers as well as a team goal orientation measure shortly after they complete the task.

Measures

State team goal orientation. A 16-item self-report questionnaire investigating team state goal orientation was used in this study (Bunderson, & Sutcliffe, 2003). Items are measured on a 5 point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). This scale was originally developed by Vanderwalle (1997) to measure team goal orientation, and was subsequently adapted and modified by Bunderson and Sutcliffe (2003) for purposes of measuring team state goal orientation. Examples of team learning state goal orientation items include “Right now, my team hopes to gain a broader and deeper knowledge on this task” and “”. Examples of team performance state goal orientation includes “Right now, it is important to my team to do better than the other team on this task” and “My team is striving to demonstrate our abilities exceed those of other teams on this task”. The team state learning goal orientation and team state performance goal orientation has a Cronbach’s alpha of is .95 and .90 respectively. The scale has a r_{wg} value of .98, with ICC (1) of .14 and ICC (2) of .61,

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suggesting the scale has both high within group agreement and a reliable team level mean aggregation.

Team idea similarity Team idea similarity is measured through ratings by three independent coders, blind to the manipulation condition of the teams. The coders were first asked to attend a briefing session, where the two ideas that were given to the teams were shown to the coders. Following that, coders were informed of key ideas to look out for when rating each of the teams' ideas for similarity. The coders were then asked to do a few practices coding to ensure similar understanding of the coding requirements. Coders were asked to rate the team ideas for similarity on a scale of 1-7, with 1 being least similar and 7 being most similar. The similarity rating of idea 1 and idea 2 were added together to form a combined similarity score, representing the similarity of the team idea to the two different ideas that were given to teams for reference. As there were 3 coders involved in the coding, inter rater reliability ICC was assessed using a two-way mixed, consistency, average-measures ICC (McGraw & Wong, 1996) to assess the degree that coders provided consistency in their idea similarity ratings across teams. The resulting ICC was in the excellent range, $ICC = 0.91$ (Cicchetti, 1994), indicating that coders had a high degree of agreement and suggesting that similarity of idea was rated consistently across teams.

Team creativity Team creativity is measured through ratings by 3 independent coders, blind to the manipulation condition of the teams. The coders were first briefed on the definition of creativity, defined as ideas that are both novel and useful (Amabile, Conti, Koon, Lazenby, & Herron, 1996).. Examples of ideas that are considered creative and not creative were then shared with the coders to ensure a common understanding of what constitutes a creative idea. are rated along a scale of 1

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to 7, with 1 being the least creativity and 7 being the most creative. During the briefing with the coders, a rating rubric was developed for reference of the coders when doing the creative ratings. Similarly, there were 3 coders that rated the ideas for team creativity as well. Therefore, inter rater reliability ICC was assessed using a two-way mixed, consistency, average-measures ICC (McGraw & Wong, 1996) to assess the degree that coders provided consistency in their creativity ratings across teams. The resulting ICC was in the excellent range, $ICC = 0.82$ (Cicchetti, 1994), indicating that coders had a high degree of agreement and suggesting that team creativity was rated consistently across teams as well.

Results

To examine hypothesis *H1*, an independent samples t-test is conducted to test if the combined similarity scores of teams in the equality condition are significantly different from teams in the equity condition. Given a violation of Levene's test for homogenous of variance, $F(1,61) = 8.24, p < .01$, a t-test not assuming homogeneous variance is used. Results show that there was a significant difference in the scores for similarity scores for equality ($M = 10.84, SD = 1.29$) and equity ($M = 2.94, SD = .84$) conditions; $t(51.1) = 28.56, p < .001$. The effect size ($d = 5.22$) was found to exceed Cohen's (1988) convention for a large effect ($d = .80$). Therefore, the results indicate that *H1* is supported, where individuals in the equality condition ($M = 10.84, SD = 1.29$) produced more similar ideas and are more likely to fixate on ideas given to them than groups in the equity condition ($M = 2.94, SD = .84$).

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Table 1. Results of independent samples t-test for Similarity of Ideas

Similarity of ideas	<i>Levene's Test for Equality of Variances</i>		t-test for Equality of Means		
	F	Sig.	t	df	Sig.
Equal variances assumed	8.24	.006*	28.75	61	.00*
Equal variances not assumed			28.56	51.1	.00*

p < .05*

An independent samples t-test is conducted to test for *H2*, determining if the creativity ratings of teams in the equality condition are significantly different from teams in the equity condition. Results show that there was a significant difference in the scores for similarity scores for equality (M= 4.21, SD= .99) and equity (M= 4.98, SD= .98) conditions; $t(61) = -3.06, p < .005$. The effect size ($d = .96$) was found to exceed Cohen's (1988) convention for a large effect ($d = .80$). Therefore, the results indicate that *H2* is supported as well, where individuals in the equality condition (M = 4.21, SD = .99) produced ideas rated significantly much less creative than groups in the equity condition (M = 4.98, SD = .98).

Table 2. Results of independent samples t-test for Team Creativity

Similarity of ideas	<i>Levene's Test for Equality of Variances</i>		t-test for Equality of Means		
	F	Sig.	t	df	Sig.
Equal variances assumed	.80	.778	-3.06	61	.00*
Equal variances not assumed			-3.06	60.88	.00*

p < .05*

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A simple linear regression was calculated to test for H3, predicting that team creativity changes depending on team idea similarity. In other words, it is predicted that the degree in which teams fixate on ideas given to them affects the creativity ratings of the idea. A preliminary analysis was performed to ensure there was no violation of the assumption of normality and linearity. It was found that the similarity ratings of ideas significantly predicted the team creativity rating, $b = -.101$, $SE = .03$, $t(61) = -.396$, $p < .005$. Idea similarity also explained a significant proportion of variance in creativity scores, $R^2 = .157$, $F(1, 61) = 11.326$, $p < .005$. This indicates that H3 is supported, that the more similar ideas generated are to ideas suggested to the teams, the lower the ratings are in terms of creativity. The creativity rating increases by .101 per one point decrease in similarity score.

Table 3. Descriptive Statistics of Team Idea Similarity and Team Creativity

	<i>N</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Mean</i>	<i>SD</i>
Team Idea Similarity					
Equality (Positive Inter-D)	31	13.00	4.00	10.84	1.29
Equity (Negative Inter-D)	32	9.00	2.00	2.93	0.84
Team Creativity					
Equality (Positive Inter-D)	31	5.67	2.00	4.21	.99
Equity (Negative Inter-D)	32	6.66	2.33	4.78	.98

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In addition, a multiple regression analyses was done to examine if the idea fixation seen in the different reward conditions are indeed moderated by team performance and learning goal orientation. The values for team learning and performance goal orientation were first centered, in which the mean value is adjusted to be zero. This process of standardization minimizes the impact of collinearity on the data. In addition, as the reward conditions are categorical in nature, the two conditions (equity and equality) are dummy coded before the multiple regression analysis is done. To test for H4, in which team learning goal orientation was predicted to moderate the effects of reward equality on idea fixation, team learning goal orientation and the dummy coded reward condition is included in the first step to predict any effects of team learning goal orientation and fixation on team's idea fixation. In the second step, an interaction term between the dummy coded reward condition and team learning goal orientation was used to test for any potential interaction effects between the two variables. The results showed that the addition of the interaction term did not explain a significant increase in variance for idea fixation, $\Delta R^2 = .01, F(1, 59) = 1.28, p = .262$. This shows that team learning goal orientation is not a significant moderator of the relationship between the team reward condition and idea fixation. Thus, the hypothesis H4 is rejected. Following on, to examine hypothesis H5, the above procedure was repeated, substituting team learning goal orientation for team performance goal orientation, and changing the respective . Based on the hypothesis H5, it is expected that team performance goal orientation moderates the effect of reward equity on idea fixation in teams. In this case, results also showed that an addition of interaction term to the model does not explain a significant increase in variance predicting idea fixation from reward structure as well, $\Delta R^2 = .00, F(1, 59) = .28, p = .598$. This indicates that team performance goal

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orientation is not a significant moderator of the relationship between reward structure and idea fixation, and H5 is rejected as well. The below table shows a summary of results for the multiple regression.

Table 4. Summary of Multiple Regression Analyses for Predicting Team Learning and Performance Goal Orientation as Moderators

	Step 1		Step 2	
	<i>B</i> (SE)	<i>P</i>	<i>B</i> (SE)	<i>p</i>
Team Learning Goal Orientation				
Reward structure	7.767 (.313)	.000*	-	-
Team Learning Goal Orientation	.149 (.166)	.373	-	-
Interaction Term (Reward*TLGO)	-	-	0.377 (.333)	.262
Team Performance Goal Orientation				
Reward structure	7.817 (.350)	.000*	-	-
Team Performance Goal Orientation	-.074 (.192)	.700	-	-
Interaction Term (Reward*TPGO)	-	-	.205 (.386)	.598

Discussion

This study serves to identify a few key findings that would serve to advance our understanding of the role of rewards and its effects on idea fixation and creativity within teams. The concept of idea fixation has majority of its roots in the area of cognitive psychology, and is rarely explored in the context of organizational behavior and team creativity idea generation (Paulus, & Nijstad, 2003). First, this study highlights the role of reward structure (equity vs equality) in relation to teams and how it affect's idea fixation. Specifically, it was found that teams in the equality conditions were more likely to fixate on ideas readily available to them than teams in the equity condition. Past research has shown that rewards serves as one of the strongest non-intrinsic motivator for goal striving, (DeShon, Kowlowski, Schmidt, Milner, & Wiechemann, 2004), and that one's individual benefits and needs are always prioritized over team goals (Carver, & Scheier, 1998). Therefore, in combination with evidence from past research, this study asserts that depending on the reward structure of the team, one's individual motivation would differ. This in turn affects how the teams work together and brainstorm for ideas. This has two important implications for future creativity research. One, in examining creativity of teams, it is important to consider the possible presence of idea fixation in the task. In certain situations, it might not be that teams are not creative, but that due to fixation, their ideas are scoped based on the possible solutions presented to them. Two, due to the dynamic nature of teams, this also brings up the need to examine the nature of team design in creativity task. In this study, it is shown that although the eventual team reward given to the team is the same (total of \$60), by simply varying the reward structure of the team, it has influence on the team processes, and the eventual team outcome. As such, it is important for us to consider all aspects of team design

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while conducting studies on team creativity, as teams are not only affected by what is given to them, but also how teams are structured and formed.

Second, this study found that the amount of fixation by teams is directly related to the creativity ratings of ideas generated by the teams. In the study, it was shown that the greater the fixation by teams (ie. the more similar ideas are to those suggested), the less creative the ideas are being rated. This suggests that fixation has practical implications on innovation and creativity within teams. As discussed earlier, creativity and innovation within the workplace today is an important consideration for many organizations in their team management strategy (Park, & DeShon, 2010). Furthermore, this study also indicates that fixation plays an integral role in determining the eventual quality and creativity of ideas generated in creative work teams. This has implications on future study designs, as well as possibly suggest the role of fixation as a moderator and mediator of various creativity related team processes. In addition, in situations where teams fixate on ideas, the ideas generated by teams are often still highly useful, but no longer as novel. In the field of creativity research, creativity is commonly defined as ideas both useful and novel (Amabile, Conti, Koon, Lazeenby, & Herron, 1996). However, in this case, ideas were found to be significantly much less creative when ideas lose its novelty, but not its usefulness. This highlights the need to look into the role the individual dimensions of creativity play in determining overall creativity. In other words, is creativity a function of both novelty and usefulness, or is novelty a dimension that is disproportionately more influential on the perceived creativity that creativity?

Third, this study aims to examine the role of motivation, in particular the role of team learning and team performance goal orientation in the process of fixation, and eventually on team creativity. Based on the theory of interdependent regulatory

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dynamics, it was suggested that individual motivations within teams, influences the goals of the team as a whole and thus, results in different outcomes (Park, Spitzmuller, & DeShon, 2013). In an attempt to elucidate a better understanding of this theory, the study looked at the role of goal orientation in moderating the degree of idea fixation within teams. However, although results of the analysis returned with no significant interaction effects, this still serves to highlight important considerations in terms of the effects of goal orientation on the fixation of ideas, as well as on creativity of teams. Past studies has repeatedly shown that team goal orientation has a significant effect on various team processes such as feedback seeking (VanderWalle, & Cummings, 1997; VandeWalle, Ganesan, Challagalla, & Brown, 2000), goal setting (Phillips, & Gully, 1997) and team adaptability (Kozlowski, Gully, Brown, Salas, Smith, & Nason, 2001). Therefore, it is highly likely that team goal orientation does have an effect on the degree of idea fixation and team creativity. The failure to find a significant effect in this study could possibly due to a few reasons. First, it could be due to an error in the aggregation of team learning goal orientation measure used. In this study, based on a paper by Chan (1998), an additive model is used in the aggregation of team goal orientation. However, in an additive model, it does not necessarily account for individual differences within the team. In other words, while certain individuals can possibly perceive high learning goal orientation, others in the team can perceive a low learning goal orientation. In such cases, an aggregation of the individuals within the team results in the team having a moderate team learning goal orientation, despite having individuals both high and low in learning goal orientation. Alternatives to this could be to measure goal orientation at the individual level, and aggregate the results using the direct-consensus or referent-shift consensus models. In this case, team goal orientation would be based on agreement between team members,

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rather than an average of individual ratings. Second, the failure to find an effect of team goal orientation could be due to the way goal orientation is measured. Being a 30 minutes study, teams might not have sufficient time to accurately evaluate and judge the perception of goal orientation in teams. In these cases, it might be more effective for team goal orientation to be determined via an objective rating by coders through watching the teams interact in the videos that are taken during the experiment.

This study is not without its limitation. First, studies have shown that by simply examining reward structures, it does not provide a full account of the effects on team processes. In fact, it has been shown that team reward structures interacts with different team task structure, of the team take on differ resulting in a variation of team outcomes (Dang, 2004). Examples of such team task structure include different forms of role division within the teams, or different nature of task. As such, future studies should explore how team task structures interacts with team reward structures to affect fixation of ideas, as well as team creativity. Second, in this study, due to limitations in time and resources, the study largely focuses on identifying team level antecedents such as team rewards, as well as team level effects, such as team idea fixation and team creativity. However, as team processes is one which is multi-level, and dynamic, it is important to examine cross-level effects. For example, effects of team rewards on individual level outcomes such as individual self-efficacy, motivation and affect could be examined. In turn, these individual level outcomes can possibly serve as mediators to explain team level outcomes. Third, due to limitations in time and resources, teams are put through a 30 minutes task, with minimum time to understand the nature of the team and teammates fully. In a review of teams by Erickson and Gratton (2007), it was found that teams need about 20 to 30 minutes

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before individual members begin to understand the nature of each member of the team. As such, future studies could also explore team tasks which are longer in duration, allowing ample time for teams to get to know one another, as well as allow us to more accurately evaluate the team processes occurring within these work teams.

Conclusion

In summary, the findings in this study serves to provide a foundation for future explorations in team creativity research. Consistent with the theory of interdependent regulatory dynamics (Park, Spitzmuller, & DeShon, 2013), team processes is one which is dynamic and interdependent on one another to affect team outcome. Team reward structure results in changes in individual goals, which lead to changes in team goals (fixation of ideas), and eventually affects the creativity ratings of ideas by the team. The result also seek to highlight the importance of examining and considering the possibility of idea fixation in team creativity tasks, as well as the role of motivation in affecting one's tendency to fixate on existing ideas. All in all, these findings contribute to advancing the understanding of the team creative process, in particular the effects of different team rewards on the tendency for teams to adopt ideas from those suggested by others, as well as how that leads to more/less creative ideas.

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