USER CREATIVITY IN CROWDSOURCING COMMUNITY: FROM EXTRINSIC MOTIVATION PERSPECTIVE

Lingfei Zou
Huazhong University of Science and Technology, zlfy123@gmail.com

Weiling Ke
Clarkson University, wke@clarkson.edu

Jinlong Zhang
School of Management, Huazhong University of Science and Technology, prozhangjl@gmail.com

Kwok Kee Wei
City University of Hong Kong, isweikk@cityu.edu.hk

Follow this and additional works at: http://aisel.aisnet.org/pacis2014

Recommended Citation
Zou, Lingfei; Ke, Weiling; Zhang, Jinlong; and Wei, Kwok Kee, "USER CREATIVITY IN CROWDSOURCING COMMUNITY: FROM EXTRINSIC MOTIVATION PERSPECTIVE" (2014). PACIS 2014 Proceedings. 45.
http://aisel.aisnet.org/pacis2014/45

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2014 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
USER CREATIVITY IN CROWDSOURCING COMMUNITY: FROM EXTRINSIC MOTIVATION PERSPECTIVE

Lingfei Zou, School of Management, Huazhong University of Science and Technology, Wuhan, Hubei, China; Department of Information Systems, City University of Hong Kong, Hong Kong, zlfiy123@gmail.com

Weiling Ke, School of Business, Clarkson University, Potsdam, NY, USA, wke@clarkson.edu

Jinlong Zhang, School of Management, Huazhong University of Science and Technology, Wuhan, Hubei, China, prozhangjl@gmail.com

Kwok Kee, Wei, Department of Information Systems, City University of Hong Kong, Hong Kong, isweikk@cityu.edu.hk

Abstract

Lack of creative ideas is always the biggest challenge that firms are facing in their innovative activity (Leimeister et al. 2009), and firms are increasingly using crowdsourcing to capture diversity ideas from external people. Unfortunately, these crowdsourcing activities can sometime lead to ideas with less creativity than those ideas generated by internal employees (Blohm et al. 2011; Boudreau 2012; Leimeister et al. 2009). This research investigates the effect of users’ extrinsic motivation on idea creativity within the crowdsourcing community. Based on self-determination theory, we propose that four types of extrinsic motivation will positively affect the creativity of ideas generated by crowdsourcing community. Through a survey of 202 participants in China's largest crowdsourcing community, we find our research model is generally supported. We further observe the significant moderating effects of promotion focus on the relationship between extrinsic motivation and creativity. Our research provides both theory and practice implications.

Keywords: Crowdsourcing, self-determination, promotion focus, creativity
1 INTRODUCTION

Lack of creative ideas is one of the biggest challenges that firms are facing in their innovative activities (Leimeister et al. 2009). In recent years, crowdsourcing has become a widely popular phenomenon, which allows an organization to capture fresh ideas from people external to the organization through platforms such as InnoCentive and Threadless. However, the creativity of ideas generated by crowdsourcing communities often falls short of the organization’s expectations (Blohm et al. 2011; Boudreau 2012; Leimeister et al. 2009). According to creativity literature and electronic brainstorming research, participant’s motivation plays an important role in influencing their creativity. Motivation can be divided into two types: intrinsic motivation and extrinsic motivation (Ryan et al. 2000a). Intrinsic motivation is inherent in people and thus firms can hardly influence intrinsic motivation in crowdsourcing communities. In contrast, extrinsic motivation is determined by what is afforded by the environment and can be stimulated by some practices such as transformational leadership (Shin and Zhou 2003). Therefore, a research on extrinsic motivation’s effects on the creativity in crowdsourcing communities would shed new light on our understanding of how the organization can proactively influence the crowdsourcing communities and truly benefit from such open innovation practice.

A careful literature review reveals that the research findings on extrinsic motivation’s effects on creativity are mixed and even controversial. For example, when Amabile (1985) first investigated the effect of extrinsic motivation on creativity, she found that extrinsic motivation would decrease creativity. In contrast, Burroughs et al. (2011) found that, with specific trainings, external rewards can improve individual’s creativity. The mixed findings can be attributed to two reasons. First, scholars conceptualize extrinsic motivation differently. While some researchers focus on financial rewards and social reputation as extrinsic motivation for individuals’ participation in open innovation communities, others conceptualize extrinsic motivation as improving capabilities and identifying with the communities (Boudreau et al. 2013; Kaikati et al. 2013; Kosonen et al. 2013; Organisciak 2010). With the different conceptualizations and operationalization of the construct of extrinsic motivation, it is no surprise that different studies report quite different effects of extrinsic motivation (Shao et al. 2012; Leimeister et al. 2009; Zheng et al. 2011; Battistella et al. 2012; Brabham 2010; Majchrzak et al. 2013). Second, prior research has primarily focused on the direct effects of extrinsic motivation and ignored the possible moderating effects of psychological factors. It is well established that the effects of extrinsic motivation are contingent upon an individual’s orientation (Grant et al. 2011; Hirst et al. 2009). Neglecting such moderating effects could cause the problem of inconsistent findings of previous studies.

To address these shortfalls of the existing literature, we intend to explore the effects of a spectrum of extrinsic motivation in crowdsourcing communities and examine how these effects are moderated by the participants’ promotion focus. Specifically, drawing upon the Self-Determination Theory (SDT), we categorize extrinsic motivation into four categories, rather than regarding it as a unitary construct. According to SDT, based on the degree to which the value and regulation of the task have been internalized and integrated, extrinsic motivation can be of four types, i.e., external motivation, introjected motivation, identified motivation, integrated motivation varying from controlled regulation to autonomy regulation(Deci et al. 2000; Gagne et al. 2005; Ryan et al. 2000b). Indeed, the many motivations identified by previous research on crowdsourcing communities, such as financial rewards, job opportunities, enhancing working sills, self-development, gaining recognition from peers, identifying with the community(Battistella et al. 2012; Boudreau et al. 2013; Brabham 2010; Franke et al. 2012; Hossain 2012; Majchrzak et al. 2013; Organisciak 2010; Zhao et al. 2012; Zheng et al. 2011), can be categorized into these four types. As such, we investigate how these four types of motivation differentially affect participants’ creativity. Also, following the Regulatory Focus Theory (RFT), we explore the moderating effects of promotion focus on the relationships between extrinsic motivation and creativity. According to RFT, there are two types of motivation systems, namely promotion and prevention focus (Higgins 1998; Higgins 2000). In particular, promotion focus encourages an
individual to strive for growth and achievement by taking risk, thereby facilitating motivation’s leading to creative outcomes (Higgins 2000; Wallace et al. 2006). Therefore, we choose to focus on the moderating effect of promotion focus. Our research model is generally supported by data collected data from ZhuBajie, the biggest crowdsourcing community in China.

2 THEORETICAL BACKGROUND

2.1 Self-determination theory

Motivation has been recognized as an important factor affecting human behavior and performance (Locke et al. 2004). SDT provides us a systematic model to categorize different motivations. SDT contends that motivation is not a unitary construct. Instead, extrinsic motivation can be divided into four forms: external motivation, introjected motivation, identified motivation, integrated motivation, based on the degree to which that individuals internalize the value and regulation underlying tasks (Deci et al. 2000; Gagne et al. 2005; Ryan et al. 2000b). External motivation is the most controlled motivation. It refers to an individual’s performing a task in order to obtain a reward or satisfying an external demand. With external motivation, individuals will take action only when it is instrumental to those outcomes. Introjected motivation refers to individuals’ understanding the regulation and value but not accepting it as their own. Identified regulation is a relatively self-determined extrinsic motivation that energizes an individual to perform a task because he identifies the value underlying the specific task. Regarding to integrated motivation, it means individuals fully assimilate regulation and regard it as part of themselves (Ryan et al. 2000b).

Prior research has identified a lot motivating factors for participating in crowdsourcing communities (Afuah et al. 2012; Archak 2010; Bayus 2013; Bloodgood 2013; Boudreau et al. 2013; Brabham 2010; DiPalantino et al. 2009; Dodge et al. 2013; Hossain 2012; Huberman et al. 2009; Kaikati et al. 2013; Kosonen et al. 2013; Majchrzak et al. 2013; Olson et al. 2012; Stewart et al. 2010). For example, Bayus (2013) found that sense of community membership would motivate participants to comment on others’ ideas more actively, while Brabham (2010) suggested that participants were motivated by the opportunity to get financial reward and take up freelance work. However, these factors are examined solely in different studies, and the influence mechanism varies across different type of motivations (Deci et al. 2000). In order to gain insights into how motivations affect participants’ creativity performance, we need to draw on a consolidated theoretical lens to categorize the various motivations into a unified framework. This can also help us recognize how to stimulate participants for novel and quality ideas. According to SDT, the identified factors can be categorized into different types of motivation as shown in Table 1. We identified factors related with financial rewards and job opportunity as external motivations. We regard factors indicating reputation and self-development as introjected motivation because their values are relatively controlled. Factors related with personal importance are categorized into identified motivation. Factors pertaining to individual beliefs and value are identified as integrated motivation.

According to SDT, different motivations reflect different degree to which that the regulation and value of the related behavior are internalized and integrated (Ryan et al. 2000a; Ryan et al. 2000b). Different motivations vary from controlled to autonomous and will lead to different experiences and outcomes. Specially, more autonomous motivations usually relate to higher positive outcomes, such as better performance (Miserandino 1996), longer persistence (Vallerand et al. 1992), greater engagement (Connell et al. 1991) and higher learning quality (Grolnick et al. 1987).

<table>
<thead>
<tr>
<th>Motivation Type</th>
<th>Motivations in Crowdsourcing community</th>
</tr>
</thead>
<tbody>
<tr>
<td>External motivation</td>
<td>To make money by contribute creative ideas or solutions(Bayus 2013)</td>
</tr>
<tr>
<td></td>
<td>To share profit by sell creative ideas to firms(Horton et al. 2010)</td>
</tr>
<tr>
<td></td>
<td>To improve job prospect (Brabham 2008; Brabham 2010)</td>
</tr>
<tr>
<td>Introjected motivation</td>
<td>To burnish reputation in specific field(Boudreau et al. 2013; Brabham 2008; Brabham 2010)</td>
</tr>
</tbody>
</table>
To demonstrate own ability (Battistella et al. 2012; Zheng et al. 2011)  
To alleviate peer pressure (Hossain 2012)

**Identified motivation**  
Identify the value of sponsored firms (Hossain 2012)  
Identify the value of crowdsourcing community (DiPalantino et al. 2009)  
Desire to increase the welfare of other people (Hossain 2012)

**Integrated motivation**  
Believe that he belongs the crowdsourcing community (Brabham 2010)  
Past success makes participants sense of belong to the sponsored company. (Bayus 2013)  
The challenge of solving difficult problems (Afuah et al. 2012)

**Intrinsic motivation**  
Feel happy to express creative ideas freely (Battistella et al. 2012)  
Be interested in the firms’ new product development process (Brabham 2008; Brabham 2010)  
Addiction to the tasks proposed and love to the community (Estelles-Arolas et al. 2012)

<table>
<thead>
<tr>
<th>Table 1 Mapping of Motivation in Crowdsourcing Community to SDT Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.2 Regulatory focus theory</strong></td>
</tr>
</tbody>
</table>

According to motivation theory, the effect of motivation on performance depends on individual’s orientation (Judge et al. 2002). In this research we choose regulatory focus as an important orientation that would affect how different types of extrinsic motivation affect performance outcomes in crowdsourcing communities. According to RFT, there are two different but co-existing self-regulatory systems: promotion focus and prevention focus. With promotion focus, individuals try to satisfy their needs for growth, advancement and achievement, and pursuit ideal self. They are sensitive to the presence and absence of positive outcomes. In the contrast, individuals with prevention focus seek security needs and try to pursuit ought self. They are sensitive to presence and absence of negative outcomes. With two different self-regulatory focus systems, individuals will take different strategies and preference to fulfill their goals.

In crowdsourcing, participants can take two different ways to get their ideas adopted. On the one hand, promotion-focused participants can try to reduce discrepancies between task requirement and their work result. Therefore, they would be eager take commission errors and take more risks. On the other hand, prevention-focused participants can try to avoid their work result violating firms’ requirements, therefore, they are eager to take omission errors and are more sensitive (Higgins 1998; Higgins 2000). As different means to achieve goals, regulatory focus will affect individuals’ selective information processing, and thus moderate the effect of motivation on task performance (Lanaj et al. 2012; Yoon et al. 2012). Specifically, under high information overload, individuals tend to rely on information which is consistent with his regulatory focus. When performing creative tasks, people always have a high information overload as they need to combine large amount of information into a new and comprehensive idea. Promotion focused individuals usually rely on positive and potentially useful information and prevention focused individuals usually rely on negative and task-related information. Consequently, with different regulatory focus, participant’s motivation will trigger different creative performance.

Previous research mainly regards regulatory focus as chronic characteristics which derive from personality and culture (Higgins 1997; Higgins 2000). However, recent researches increasingly regard regulatory focus as a psychology state that varies across different situations (Wallace et al. 2006). Molden et al. (2009) also suggest that social exclusion (Being rejected vs. being ignored) will cause different regulatory focus. Therefore, individuals possess both promotion focus and prevention focus, and which one becoming salient depends on the motivations that stimulated by the situation factors (Higgins 1997; Wallace et al. 2006). In this research, we mainly focus on promotion focus because crowdsourcing aims to trigger and capture creativity ideas, thus highly encouraging and tolerating novel or breakthrough ideas. This kind of environment will make promotion focus conducive to extrinsic motivations’ influencing participants’ creativity.
3 HYPOTHESES

According to SDT, motivation stimulates people for initiating and persisting at behaviors to the extent that they believe their effort would lead to a desired outcome (Deci et al. 2000). In crowdsourcing context, extrinsic motivation would positively affect participant’s creative performance. As crowdsourcing is a completely open platform, there is no constrain or restriction imposed on participants. They participate in crowdsourcing simply because of they want to get something they expect from this community. Sauermann et al. (2010) suggest that extrinsic rewards can drive participants to improve their creative performance through two channels: quality of effort (i.e. the number of hours worked) and character of effort (i.e. allocation of effort to different cognitive activity). Burroughs and Eisenberger also proved that when extrinsic rewards were contingent on creativity, individual creative performance would increase (Burroughs et al. 2011; Eisenberger et al. 1998).

particularly, external motivation (most controlled motivation) drives participants to work hard to generate creative ideas. In crowdsourcing communities, rewards are outcome-oriented and contingent on creativity. In order to get the expected rewards, such as money or job opportunities, participants must contribute creative ideas that can satisfy firm’s requirement. This is especially true when firms reward for only several best ideas. If the ideas contributed can’t meet the organization’s requirements, the participant is not going to get the expected reward. Kahai et al. (2003) found that individual rewards could reduce social loafing and facilitate the generation of original ideas in electronic meeting systems. With external motivation, participants usually choose tasks that they are familiar with and feel competent about. In order to satisfy the reward requirements, they will try to search task-related information and combine it with their expertise to generate new solutions. According to Volf and Tarasova, monetary reward is more effective in activating creative ideas than verbal stimulus (Volf et
al. 2013). Furthermore, the relationship between external motivation and creative performance is also supported by prior studies (Burroughs et al. 2011; Eisenberger et al. 1998). Therefore, we have the following hypothesis:

**Hypothesis 1a:** External motivation is positively related to creative performance in the crowdsourcing community.

With introjected motivation, a participant wants to get recognition from peers and demonstrate his ability in crowdsourcing community. According to achieved status theory, one’s reputation is determined by his contribution and achievement (Gould 2002). In crowdsourcing communities, a participant’s reputation and status is ranked by only one indicator — the number of creative ideas adopted by firms. In order to develop recognition, the participant must increase his number and rate of adopted ideas. In this situation, they would try their best to generate creative ideas, work harder and try different cognitive effort. Moreover, Gong et al. (2012) posit that ability proving would lead to the generation and contribution of creative ideas. With ability proving motivation, participants tend to share task-related information and accept useful suggestions from others. It is established in the knowledge management literature that exchanging of knowledge and ideas would provide individuals the opportunity to access previously unreachable knowledge or combine previously uncombined knowledge, therefore, generating more creative ideas. Hence, we have the following hypothesis:

**Hypothesis 1b:** Introjected motivation is positively related to creative performance in the crowdsourcing community.

Identified motivation is a relative self-determined motivation. It refers to participants’ identifying the crowdsourcing community or firm’s value as his own. Myer et al. (2004) argued that identification with an organization usually leads to an affective commitment to that organization. With a strong affective commitment, participants would adjust his goal in accordance with the community’s goals (Johnson et al. 2010; Meyer et al. 2012). With identified motivation, participants will show significant organizational citizenship behavior and not care about personal gain or loss (Carr et al., 2003). Furthermore, to generate creative ideas, it takes a lot of time and energy to solve specific problem for the community. That is, when identifying the value of the crowdsourcing community, participants would feel their efforts are worthy (Oldham & Cummings, 1996) and are thus willing to expend effort to attain the community goals (Ackfeldt & Coote, 2005). Thus, we have the following hypothesis:

**Hypothesis 1c:** Identified motivation is positively related to creative performance in the crowdsourcing community.

With integrated motivation, an individual integrates the crowdsourcing community’s core value (i.e. express creative ideas freely, help others) as one important part of himself. Participants feel the community provides a good place for them to express unconventional thoughts without any concern. They regard their participation in the crowdsourcing community as very important and meaningful. As a result, integrated motivation will inspire participants’ flexible cognitive effort that would lead to creative ideas. So we have the following hypothesis:

**Hypothesis 1d:** Integrated motivation is positively related to creative performance in the crowdsourcing community.

3.2 Promotion focus and creativity

Generating creative ideas needs flexible cognitive style that encourages individuals to take risk by violating the conventional way of seeking novel problem solutions (Baer et al. 2003; Kirton et al. 1994; Tierney et al. 2004), such as Steve Jobs’s providing revolutionary IPhone to challenge the traditional definition of mobile phones. However, this creative behavior is more likely to happen when the individual has a promotion focus. In the crowdsourcing context, regulatory focus refers to participants’ try to achieve ideal self with approach methods. With promotion focus, individuals are eager to try different ways to solve problem even if they will take commission error (Crowe et al. 1997). As they are sensitive to presence and absence of good outcomes, they tend to have an exploratory orientation and are open to novel information (Friedman et al. 2001; Liberman et al. 1999). Hence, when solving problems, promotion focused individuals usually access a variety of knowledge
and try different combinations of different types of knowledge. They are more likely to generate more alternatives. A number of studies have proved the positive relationship between promotion focus and creative performance (Crowe et al. 1997; Friedman et al. 2001; Neubert et al. 2008; Wu et al. 2008). What’s more, promotion focus also stimulates a positive emotion which is very important to individual creativity (Carver et al. 2000).

In addition, creative tasks are usually complex and uncertain. When performing creative task, it’s very natural for participants to run into obstacles. Promotion focus would lead the individual to persist and invest more physical, cognitive and emotional resource in these tasks (Kahn 1990). According to Higgins, promotion-focused individuals prefer to overcome difficulty and challenge as it will make them develop and grow (Higgins 1997). Crowe et al. (1997) also suggest promotion focused individuals would perform better when they experience failure or interruption. Therefore, we have the following hypothesis:

Hypothesis 2: Promotion focus is positively related to creative performance in the crowdsourcing community.

3.3 Moderating effect of promotion focus

In prior research, there is some evidence suggesting that extrinsic reward would (i.e. money, reputation, social status) undermine creativity (Amabile 1985; Amabile 1997). Extrinsic rewards are believed to decrease creativity by reducing intrinsic motivation (i.e. individual’s interest in the task itself). It has motivated a lot of studies to investigate how and why extrinsic rewards undermine individual creative performance. For example, Hennessey and colleagues conducted an experiment and found that when emphasized the intrinsic aspect of performing well, student with extrinsic reward showed higher creativity than student with no rewards. Burroughs et al. (2011) also found that with creative training, extrinsic rewards would increase employee’s creativity. These studies speculate that the effect of extrinsic rewards on creativity is affected by individual’s understanding of extrinsic rewards’ role in creative process. Rewards can be regarded either as constrain (external control on his behavior) or informational (i.e. providing positive information).

Promotion focused people tend to perceived extrinsic rewards as informational as they are more sensitive to positive outcomes. The desire for good outcomes will make participants put more effort to get expected rewards in crowdsourcing communities. According to expectancy theory, one individual’s decision on whether to take a task and how much effort to contribute depends on one judgment: how important the reward is important to him. With different external motivations, participants want to get different rewards, such as money, reputation, sense of belonging, or satisfaction of self. With promotion focus, participants would emphasize on these rewards. With the orientation toward realizing the ideal self and pursuing achievements, these participants would give these external motivations more meaning and will derive psychological satisfaction from creative outcomes.

Moreover, according to regulatory focus theory, individual prefer to take action and expend more effort when the task fits their regulatory focus orientation (Higgins2000). A lot of research has argued that individuals with promotion focus are most motivated by positive information (Lockwood et al. 2002). Cesario and Higgins (2008), and Kim (2006) confirmed this result in their research that they found people with promotion focus are more easily persuaded by positive nonverbal cues and messages about possible gains. Chatterjee found the moderating role of regulatory focus on the positive advertisement information and brand evaluation (Chatterjee et al. 2010). Pierro et al also proved that promotion focus would act as moderator in the relationship between leadership and followers’ satisfaction (Pierro, 2009). Specifically, Zhou et al found the interactive effect of promotion focus and context stimulation (Zhou et al 2012). In crowdsourcing communities, individuals with extrinsic motivation would regard all the possible rewards such as financial rewards and career advancement as what they may gain from their participation, which allow them to sense a fit between the tasks and their orientation. Therefore, given the same level of extrinsic motivation, promotion focus would mobilize the individual to exert more effort and thus lead to higher creative performance outcomes in the crowdsourcing communities. Accordingly, we propose the following hypothesis:

Hypothesis 3a: Promotion focus strengthens the relationship between external motivation and
creative performance in the crowdsourcing community.

**Hypothesis 3b:** Promotion focus strengthens the relationship between introjected motivation and creative performance in the crowdsourcing community.

**Hypothesis 3c:** Promotion focus strengthens the relationship between identified motivation and creative performance in the crowdsourcing community.

**Hypothesis 3d:** Promotion focus strengthens the relationship between integrated motivation and creative performance in the crowdsourcing community.

### 4 RESEARCH METHODOLOGY

#### 4.1 Data collection

In order to test our research model, we conducted a survey to collect data. The biggest crowdsourcing community in China, Zhubajie.com, was chosen as our research context. Zhubajie is a third-party platform in which any registered company or individual can post their tasks in the form of an open call and provide some rewards for the tasks. Participants can contribute their ideas or solutions under each task. After the deadline, firms or individuals will choose solutions that best satisfy their requirements and give rewards to the contributors. We post our survey announcement in Zhubajie, inviting participants who have ever participated in creative tasks to fill out the questionnaire. At the beginning of questionnaire, we provide a detailed introduction that describe the purpose and requirement of our survey, and assure that all the information will be kept strictly confidential. As a token of appreciation, we pay 20 RMB for complete questionnaire. Finally, we received 204 responses and 2 responses were disregarded due to respondents never participate in creative tasks.

#### 4.2 Measurement

All the items in our questionnaire were adapted from validated scales in prior studies. As all the items are derived from Western culture, we used standard translation and back translation method to ensure the scales’ face validity in Chinese context. Before formal investigation, we sent our questionnaire to 10 crowdsourcing participants. They filled out the questionnaire and report a few unclear or inappropriate questions. After two times revision and improvement, we released our questionnaire on Sojump.com. Four categorizes of motivation were measured on the basis of extant literature (Allen et al. 1996; Amabile 1993; Becker et al. 1996). A sample item reads, “I am strongly motivated by the money I can earn through performing tasks in this community”. Promotion focus was adapted from Haws et al. (2010). A sample item reads “When I seen an opportunity for performing tasks, I get excited right away”. Creativity was measure on the basis of Tierney et al. (1999). A sample item reads “My solution provides new perspective for this kind of tasks”. Table 3 shows the descriptive statistics of the variables.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Motivation</td>
<td>1.25</td>
<td>7.00</td>
<td>4.72</td>
<td>1.02</td>
</tr>
<tr>
<td>Introjected Motivation</td>
<td>1.00</td>
<td>7.00</td>
<td>4.70</td>
<td>1.10</td>
</tr>
<tr>
<td>Identified Motivation</td>
<td>3.00</td>
<td>7.00</td>
<td>5.17</td>
<td>0.83</td>
</tr>
<tr>
<td>Integrated Motivation</td>
<td>2.00</td>
<td>7.00</td>
<td>4.82</td>
<td>0.96</td>
</tr>
<tr>
<td>Promotion Focus</td>
<td>3.75</td>
<td>7.00</td>
<td>5.70</td>
<td>0.82</td>
</tr>
<tr>
<td>Creative Performance</td>
<td>2.25</td>
<td>7.00</td>
<td>4.84</td>
<td>0.74</td>
</tr>
</tbody>
</table>

*Table 3. Descriptive Statistics for Variables*

#### 4.3 Common methods bias

As all the data are subjective and collected from one single source, common method bias may become a serious issue due to participants’ halo effect or leniency biases (Podsakoff et al. 2003). Like
most research, we adopt most widely used Harman’s single factor method to test whether there is common method bias in our measurement. The result showed that there were six constructs whose eigenvalues were greater than 1 and they accounted for 76.09% of total variance. The first construct accounted only 32.94% of the total variance. Hence, the result demonstrated that there was no serious common method bias in this research.

5 DATA ANALYSIS AND RESULT

We take two steps to conduct our data analysis. First, we used confirmatory factors analysis to test reliability and validity of our measurement. Second, we used multi-regression analysis with SPSS to examine our research hypotheses.

5.1 Measurement model

To test our measurement model, we conducted confirmatory factor analysis to assess the reliability and validity of all the constructs. Reliability was assessed by the Cronbach’s alpha. As Barclay et al. (1995) suggested that Cronbach’s alpha above 0.7 indicated a good reliability. As shown in Table 4, all constructs’ Cronbach’s alpha were greater than 0.7. Hence, we could conclude that our measurement had a good reliability.

Construct validity contained two dimensions: convergent validity and discriminant validity. Convergent validity was assessed by (1) Composite reliability (2) Average variance extracted (AVE) (3) Item loadings. Composite reliability of each construct should be higher than 0.7, and all the constructs satisfied this standard as shown in Table 4. Ave captures the amount of variance that explained by its indicators. Fornell et al. (1981) suggested that AVE above 0.5 indicated a good convergent validity. The CFA results showed that all constructs AVE were greater than 0.6. In addition, items belonging to the same construct should correlate with each other highly. Our analysis results also satisfied this requirement. Hence, all three conditions were satisfied by our measurement, indicating a good internal consistency and convergent reliability.

Discriminant validity was assessed through two ways. First, according to Fornell and Larcker, the square root of AVE should be greater than the correlation coefficient between the corresponding construct and other constructs (Fornell et al. 1981). In Table 4, the numbers on diagonal are square root of AVE, and the off-diagonal are the correlation coefficient between constructs. From the results, we can see all the diagonal numbers are much higher than off-diagonal numbers. Therefore, there is good discriminant validity. Second, item loading on its corresponding construct should be much higher than on other construct. Based on Gefen’s recommendation, it’s better that the difference between item loading on corresponding construct and other construct should be more than 0.10 (Gefen et al. 2005). As shown in Table 5, all the item loadings higher than 0.72 while item cross loadings are lower than 0.50. So we can confirm good validity of our measurement.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 External Motivation</td>
<td>0.78</td>
<td>0.86</td>
<td>0.60</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Introjected Motivation</td>
<td>0.88</td>
<td>0.91</td>
<td>0.72</td>
<td>0.37</td>
<td>0.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Identified Motivation</td>
<td>0.86</td>
<td>0.91</td>
<td>0.78</td>
<td>0.27</td>
<td>0.48</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Integrated Motivation</td>
<td>0.86</td>
<td>0.91</td>
<td>0.78</td>
<td>0.35</td>
<td>0.46</td>
<td>0.49</td>
<td>0.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Promotion Focus</td>
<td>0.88</td>
<td>0.92</td>
<td>0.73</td>
<td>0.24</td>
<td>0.24</td>
<td>0.41</td>
<td>0.37</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>6 Creative Performance</td>
<td>0.83</td>
<td>0.90</td>
<td>0.75</td>
<td>0.38</td>
<td>0.20</td>
<td>0.49</td>
<td>0.43</td>
<td>0.43</td>
<td>0.87</td>
</tr>
</tbody>
</table>
Table 4. Internal Consistency and Discriminant Validity of Constructs

<table>
<thead>
<tr>
<th></th>
<th>External Motivation</th>
<th>Introjected Motivation</th>
<th>Identified Motivation</th>
<th>Integrated Motivation</th>
<th>Promotion Focus</th>
<th>Creative Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTE_2</td>
<td>0.78</td>
<td>0.45</td>
<td>0.26</td>
<td>0.29</td>
<td>0.17</td>
<td>0.27</td>
</tr>
<tr>
<td>EXTE_3</td>
<td>0.83</td>
<td>0.32</td>
<td>0.26</td>
<td>0.29</td>
<td>0.31</td>
<td>0.39</td>
</tr>
<tr>
<td>EXTE_4</td>
<td>0.72</td>
<td>0.22</td>
<td>0.13</td>
<td>0.26</td>
<td>0.05</td>
<td>0.19</td>
</tr>
<tr>
<td>EXTE_5</td>
<td>0.76</td>
<td>0.14</td>
<td>0.14</td>
<td>0.23</td>
<td>0.12</td>
<td>0.27</td>
</tr>
<tr>
<td>INTR_1</td>
<td>0.34</td>
<td>0.85</td>
<td>0.39</td>
<td>0.33</td>
<td>0.23</td>
<td>0.22</td>
</tr>
<tr>
<td>INTR_2</td>
<td>0.24</td>
<td>0.82</td>
<td>0.39</td>
<td>0.42</td>
<td>0.24</td>
<td>0.10</td>
</tr>
<tr>
<td>INTR_3</td>
<td>0.35</td>
<td>0.89</td>
<td>0.49</td>
<td>0.45</td>
<td>0.18</td>
<td>0.17</td>
</tr>
<tr>
<td>INTR_4</td>
<td>0.30</td>
<td>0.84</td>
<td>0.36</td>
<td>0.41</td>
<td>0.18</td>
<td>0.16</td>
</tr>
<tr>
<td>IDEN_2</td>
<td>0.30</td>
<td>0.45</td>
<td>0.90</td>
<td>0.47</td>
<td>0.41</td>
<td>0.52</td>
</tr>
<tr>
<td>IDEN_3</td>
<td>0.20</td>
<td>0.39</td>
<td>0.86</td>
<td>0.38</td>
<td>0.34</td>
<td>0.38</td>
</tr>
<tr>
<td>IDEN_4</td>
<td>0.18</td>
<td>0.43</td>
<td>0.88</td>
<td>0.43</td>
<td>0.32</td>
<td>0.36</td>
</tr>
<tr>
<td>INTE_2</td>
<td>0.38</td>
<td>0.39</td>
<td>0.35</td>
<td>0.87</td>
<td>0.31</td>
<td>0.37</td>
</tr>
<tr>
<td>INTE_3</td>
<td>0.27</td>
<td>0.39</td>
<td>0.43</td>
<td>0.92</td>
<td>0.33</td>
<td>0.43</td>
</tr>
<tr>
<td>INTE_4</td>
<td>0.27</td>
<td>0.47</td>
<td>0.52</td>
<td>0.86</td>
<td>0.34</td>
<td>0.32</td>
</tr>
<tr>
<td>PRMF_2</td>
<td>0.23</td>
<td>0.26</td>
<td>0.28</td>
<td>0.29</td>
<td>0.82</td>
<td>0.34</td>
</tr>
<tr>
<td>PRMF_3</td>
<td>0.18</td>
<td>0.22</td>
<td>0.38</td>
<td>0.31</td>
<td>0.85</td>
<td>0.32</td>
</tr>
<tr>
<td>PRMF_4</td>
<td>0.17</td>
<td>0.20</td>
<td>0.37</td>
<td>0.37</td>
<td>0.88</td>
<td>0.41</td>
</tr>
<tr>
<td>PRMF_5</td>
<td>0.25</td>
<td>0.16</td>
<td>0.37</td>
<td>0.29</td>
<td>0.88</td>
<td>0.39</td>
</tr>
<tr>
<td>CRPF_2</td>
<td>0.41</td>
<td>0.16</td>
<td>0.37</td>
<td>0.30</td>
<td>0.35</td>
<td>0.85</td>
</tr>
<tr>
<td>CRPF_3</td>
<td>0.28</td>
<td>0.18</td>
<td>0.47</td>
<td>0.40</td>
<td>0.38</td>
<td>0.88</td>
</tr>
<tr>
<td>CRPF_4</td>
<td>0.30</td>
<td>0.19</td>
<td>0.43</td>
<td>0.40</td>
<td>0.38</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Table 5. Cross Loading of Measurement Items to Latent Variables

5.2 Structural model

To test our hypotheses, we conducted a series of multi-regression analysis. In model 1, we only include control variables to predict participant creative performance. In model 2, we include control variables, extrinsic motivations and promotion focus to predict participant creative performance. In model 3, we include interactions of promotion focus and different motivations into model 2. From the table 6, we can see that model 2 has a much higher variance explain power than model 1 with \( R^2 = 0.426 \). The F value of comparison between model 1 and model 2 is 13.542. Also model 3 has a much higher variance explain power than model 2 with \( R^2 = 0.511 \). The F value of comparison between model 2 and model 3 is 12.383. Taken together, there multi-regression analysis result provide solid evidence to test our hypotheses.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>T-Value</td>
<td>Sig.</td>
</tr>
<tr>
<td>Group Size</td>
<td>0.028</td>
<td>0.347</td>
<td>0.729</td>
</tr>
<tr>
<td>EXPINF</td>
<td>0.175</td>
<td>2.131</td>
<td>0.035</td>
</tr>
<tr>
<td>Work Time</td>
<td>-0.066</td>
<td>-0.800</td>
<td>0.425</td>
</tr>
<tr>
<td>External Motivation (EXTE)</td>
<td>0.220</td>
<td>3.200</td>
<td>0.002</td>
</tr>
<tr>
<td>Introjected Motivation (INTR)</td>
<td>-0.211</td>
<td>-2.743</td>
<td>0.007</td>
</tr>
<tr>
<td>Identified Motivation (IDEN)</td>
<td>0.340</td>
<td>4.326</td>
<td>0.000</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Integrated Motivation (INTE)</td>
<td>0.195</td>
<td>2.468</td>
<td>0.015</td>
</tr>
<tr>
<td>Promotion Focus (PMF)</td>
<td>0.253</td>
<td>3.561</td>
<td>0.000</td>
</tr>
<tr>
<td>EXTE*PM F</td>
<td>0.148</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTR*PM F</td>
<td>-0.103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDEN*PM F</td>
<td>0.270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTE*PM F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.031</td>
<td>0.426</td>
<td></td>
</tr>
<tr>
<td>Adjust R²</td>
<td>0.011</td>
<td>0.395</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1.586</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *P<0.05; **P<0.01; ***P<0.001. EXTE refers to external motivation. INTR refers to introjected motivation. IDEN refers to identified motivation. INTE refers to integrated motivation. PMF refers to promotion focus.

Table 6. Multi-Regression Analyses Results

From model 2, we can see that only one control variable experience in professional field (β= 0.217, p≤0.001) has a positive effect on participant’s creative performance. Regarding to effect of extrinsic motivation on creative performance, not all the effects are as same as supposed. External motivation (β= 0.217, p<0.001), identified motivation (β= 0.340, p<0.001), integrated motivation (β= 0.195, p<0.01) have a positive effect on participant’s creative performance. Therefore, hypotheses 1a, 1c, 1d are supported. However, introjected motivation (β= -0.211, p<0.01) have a negative effect on participant creative performance. Hence, Hypotheses 1b are not supported. Furthermore, the participant’s promotion focus (β= 0.253, p<0.001) also has a positive effect on participants’ creative performance, supporting hypotheses 2.

To test the moderating effect of promotion focus, we add interaction variable of promotion focus and extrinsic motivation into regression model. As shown in Table 6, the three interaction variables significantly increase the R square from 42.6% to 51.1% (with an increase of 8.5%, and F=12.383, p<0.001). Also, the results of model 3 shows that the interaction item of external motivation and promotion focus (β= 0.148, p<0.05) is significant, thus providing support to hypotheses 3a. The interaction item of introjected motivation and promotion focus (β= -0.103, p>0.1) and the interaction item of integrated motivation and promotion focus (β= 0.039, p>0.1) are not significant. Therefore, the positive moderate effects of promotion focus on the relationship between introjected motivation (integrated motivation) and creative performance are not supported. The interaction item of identified motivation and promotion focus (β= 0.270, p≤0.001) is significant, hence, supporting the positive moderating effect of promotion focus on the relationship between integrated motivation and creative performance.
6 DISCUSSIONS AND CONCLUSION

6.1 Implications for research and theory

Our research makes some important theoretical contributions. First, we made a distinction among participant’s extrinsic motivations in open innovation communities. Our research review extent crowdsourcing research and identified factors that motivate people’s participating online communities. Prior IS research generally regards extrinsic motivation as a broad category of participate motivation and measure it by the extent of desire to get compensation. Although this measurement assesses the quantity of extrinsic motivation, it doesn’t reflect the different nature of various motivations. This research is the first to provide a framework to classify manifold motivations identified by increasingly crowdsourcing research. According to SDT, we provide a framework to sort extrinsic motivations into four types: external motivation, introjected motivation, identified motivation and integrated motivation(Deci et al. 2000; Ryan et al. 2000b). This classification enriches our understanding of the influencing mechanism of motivation on creativity.

Second, we investigate creative performance in the open innovation communities. As crowdsourcing is a new type of online community, most research mainly focus on how to attract people to participate. Although the number of members and their participation behavior is very important for community continuance, only creative ideas can provide firms with innovation opportunity. Prior IS research investigates user’s innovative use of IS or how IS increase individual’s general performance, but hardly pays attention to user’s creative performance. To the best of our knowledge, our research makes the first attempt to investigate the different effect of various extrinsic motivations on creative performance.
Moreover, as one of few studies to explore the relationship between motivations and creativity by taking promotion focus into consideration, our study reveals that types of extrinsic motivations have different effects on creative performance and their effects are moderated by participants’ regulatory focus, promotion focus in particular. Such findings are quite different from previous researches which argue that extrinsic motivation would decrease individual creativity. But they are consistent with what is suggested by Hennessey and Burroughs (Burroughs et al. 2011; Hennessey et al. 1989), namely extrinsic motivation’s effect is contingent upon individuals’ psychological orientation and interpretation of the creative process.

6.2 Implications for practice

This study investigates the relationship between motivations and creative performance. We have shown that not all the extrinsic motivation would enhance participant’s creative performance in crowdsourcing communities. In particular, external motivation, identified motivation and integrated motivation have positive effect while introjected motivation has negative effect. In order to facilitate participants’ generating creative ideas, firms could increase financial incentives or the number of winners to activate participant’s strong external motivation. In order to decrease participants’ introjected motivation, firms should try to avoid emphasizing the responsibility or setting too many detail requirements in their task call. Moreover, SDT suggest that perceived needs (autonomy, competence, relatedness) could lead to identified motivation and integrated motivation. Some simple and easy task will help participants feel confident in finishing task and increase their enthusiasm. While a convenient and rich media communication tools could decrease the psychological distance of participants. They would develop a close relationship with others and trust the community. Also firms should not set threshold for their tasks, so participants can choose any tasks freely. In this situation, they would feel great autonomy when performing tasks.

In addition, firms should also understand the positive effect of participant’s promotion focus, which strengthen the positive effect of external motivation and identified motivation on creativity. Currently, firms usually hold one-time innovation contest in which participants contribute ideas and firms choose best ideas. Participants usually are concerned about whether their work are fairly evaluated. If firms can interact with participants and give them feedback timely, participants can understand that their efforts are valued by firms and learn how to adjust their work outcomes. Such interactions would satisfy participants’ need for growth and self-development, which would help nurture a strong promotion focus and improve creative performance in crowdsourcing communities.

6.3 Limitations and future research

It’s important to recognize that our research has some limitations, which also predict the future research direction. First, all the data are collected from one single crowdsourcing community, which would limit our result’s external validity. Although conduct survey in a single context can alleviate confound variable’s influence and increase research rigor, the relationship between extrinsic motivation and creative performance my not hold in other crowdsourcing community. In the future, we can conduct a cross-sectional research increase the generalizability of our finding.

Second, all though all the items are adapted from validated scales, the data are self-reported by participants, leading to possible common method bias. We have used Herman’s one-factor analysis to check this problem and found no serious problem. In the future, we can collect objective data to measure participant’s creative performance or let firms to evaluate their creativity.

Third, we collect all the data from participant at one time. The causal relationship between motivation and creativity can’t be observed. In the future, we would conduct a longitudinal study to offer information on how the variation of motivations affects participant’s creative performance across time, and how crowdsourcing environment affect participant’s motivation.
References


Organisciak, P. 2010. Why bother? Examining the motivations of users in large-scale crowd-powered online initiatives, University of Alberta.


