International Journal of Advanced Research in Management and Social Sciences
ISSN: 2278-6236
Impact Factor: 7.065

THE INFLUENCE OF R & D PERSON'S PASSION TYPE ON INNOVATION BEHAVIOR : THE MEDIATING EFFECTS OF POSITIVE AND NEGATIVE MOODS

TSUNG-YAO CHEN Ph.D Student, Graduate Institute of Human Resource Management Doctoral Class, National Changhua University of Education

DR. HUO-TSAN CHANG Prof Dr., Graduate Institute of Human Resource Management, National Changhua University of Education

DR.I-CHIEH HSU Prof Dr., Graduate Institute of Human Resource Management, National Changhua University of Education

ABSTRACT

For R & D work, it is important to motivate employees to work hard to reinforce innovation. And different types of passion will affect the individual's innovative behavior. But the mechanism between work passion and innovative behavior is not yet clear. So this study to explore the harmonious passion and obsessive passion and innovation between the ehaviors of the mediating process. The purpose of this study is to: (1) to explore the different types of work passion for the impact of innovative behavior; (2) to explore the positive and negative mood in the passion type and innovation between the mediating effect. In this study, the data were collected from R&D engineers and their supervisors making a pair of high-tech industry in Taiwan, respectively to the positive mood and negative mood, to explore the type of work passion affect the path of innovation. And the LISREL software was used to validate the scale with 267 samples. The structural equation model was used to verify the mediating hypothesis.

The results show that: (1) there is a positive relationship between harmonious passion and innovation behavior; (2) there is a positive relationship between obsessive passion and innovation behavior; (3) positive mood for the harmonious passion of the innovative behavior of the mediating variables; (4) negative

mood is not obsessive passion for innovative behavior of the mediating variables. According to the results of the study, this study proposes the following management implications: (1) to put the passion of the work into the recruiting R&D personnel considerations; (2) to promote R&D personnel in the work of a sense of accomplishment to improve the harmonious passion; (3) to promote and maintain the positive mood of R&D personnel to facilitate innovative behavior.

KEYWORDS: *harmonious passion, obsessive passion, mood, innovative behavior*

INTRODUCTION

Work passion is highly valued by circles of practice and it is continued to be widely discussed in newspapers, magazines, and abstracts (Boyatzis, McKee, & Goleman, 2002; Moses, 2001). Even though passion is so important, the relevant academic research is unexpectedly little and most of the research focused on situations beyond working circumstances (Ho, Sze-Sze, & Chay Hoon, 2011). Not until the development of positive psychology in recent years, the issues related to passion have started to be followed by academic circles.

Work passion is regarded as an attitude (Ho et al., 2011; Vallerand, Paquet, Philippe, & Charest, 2010). It refers to the strong psychological inclination shown on the time and energy that an individual devotes to a work item which is liked and thought important in order to establish self-identification (Vallerand et al., 2003). However, the research in the past mainly talked about the enthusiastic viewpoint of positive encouragement but ignored the negative influence that passion might cause (Frijda, Mesquita, Sonnemans, & Van Goozen, 1991; Goldberg, 1986). Other than stimulating motivation, enhancing happiness and giving meaning to life, passion might also cause negative emotions, rigid devotion, and even have an impact on the balance between work and life (Vallerand et al., 2003). In other words, the single dimensional passion is not able to fully explain the multiple connotation of passion.

Scholars Vallerand et al. (2003) believed people's passion on specific activities is good for developing and ensuring self-identification. The process will be affected by different kinds of

internalization and thus work passion is classified into harmonious passion and obsessive passion. Harmonious passion is originated in autonomous internalization and it urges individuals to engage in work activities freely and flexibly. Although the activities that individuals are passionate about have been obviously internalized to personal identification, individuals are the leaders who determine whether to engage in work activities or not. Therefore, individuals will choose to engage in activities that they are passionate about at an appropriate time according to their willingness. On the other hand, obsessive passion comes from controlled internalization. Individuals give activities that they are passionate about specific meanings (such as self-esteem, social acceptability, and excitement) and further build up interpersonal and personal pressure. Even it is at an inappropriate time, individuals will still insist to engage in activities that they are passionate about (Vallerand et al., 2003; Vallerand et al., 2010).

Academic circles and industrial circles both have long believed innovation is an important foundation for organizations' sustainability (Amabile, 1988; Greenhalgh, Robert, Bate, Macfarlane, & Kyriakidou, 2005; Kanter, 1988; Mumford, 2000; Woodman, Sawyer, & Griffin, 1993). However, the advancement of organization innovation relies on the devotion of individual's innovative behavior (Amabile, 1988; Kanter, 1988). In recent several decades, a huge amount of research has been trying actively to find out antecedent causes for innovative behavior in order to develop effective approaches to strengthen employees' innovative behavior (Amabile, 1988; Janssen, Van De Vliert, & West, 2004; Mumford, 2000; West, 2002). Nevertheless, work attitude is the key component of innovative behavior according to the componential theory of creativity (Amabile, 1988) because work attitude affects the motivation of individual's devotion to innovative behavior. Though work passion is commonly existed among employees at enterprises, very little empirical research in the past explored the influence of harmonious passion on employees' creativity (Liu, Chen, & Yao, 2011) while research related to obsessive passion still stayed at the stage of the conceptual discussion (Cardon, Wincent, Singh, & Drnovsek, 2009). In order to make up the research gap, the study includes both harmonious passion and obsessive passion to explore the effect generated from different types of work passion on innovative behavior.

According to research in the past, passion was an important psychological factor that affected personal innovation (Cardon et al., 2009; Ho et al., 2011). In conceptual research, Bierly, Kessler and

Christensen (2000) argued passion promoted personal innovation while scholars Cardon et al. (2009) argued passion and personal innovation had a relationship of an inverted-U model. It can be seen from this that passion is actually not a single dimension and different types of passion cause different influential outcomes. In terms of empirical research, current research related to the types of work passion all reveal significant positive relationship between harmonious passion and personal innovation while obsessive passion has inconsistent results. Luh and Lu (2012) used students at department of design as the research sample and found positive relationship between obsessive passion and personal innovation while the research by Liu, Chen and Yao (2011), using metal companies and commercial banks as samples, found negative relationship between obsessive passion and personal innovation. According to theories of intrinsic and extrinsic motivation, tangible rewards (materials, money...etc.) or invisible incentives (recognized by other people, self-esteem...etc.) will enhance individual's willingness in taking innovative risks (Csikszentmihalyi, 1988; Sternberg & Lubart, 1995). As a result, obsessive passion might have positive influence on innovative behavior when the work is challenging and with high payoff. In regard to high-challenging and high-payoff work (such as R&D personnel), the mediating mechanism of the above relationship has not been clearly discussed. Hence, the study aims to explore different types of work passion to understand how personal innovative behavior is affected by which mediator.

On the basis of affect control theory, affection is a meaningful signal to regulate the interaction process between specific environment and self-identification (Heise, 1985). Individuals not only establish self-identification when they are enthusiastic about specific work activities but also regulate the gap between the two through affection. A lot of research highlights affection is an important factor that affects innovative behavior (Amabile, Barsade, Mueller, & Staw, 2005; Fredrickson, 2001; Rhoades, Eisenberger, & Armeli, 2001); among it, both positive mood and negative mood affect personal innovative behavior (George & Zhou, 2007; Shalley, Zhou, & Oldham, 2004). Meanwhile, research in the past also revealed positive mood and negative mood possibly existed at the same time (Fong, 2006; George & Zhou, 2007; Sy, & Saavedra, 2005; Watson & Tellegen, 1985). Based on the argument above, the study includes both positive mood and negative mood as mediating variables in order to explain the process of individual's presentation in innovative behavior more comprehensively.

On the whole, the study makes up the research gap in the past through the following methods: (1) Only a little empirical research related to innovative behavior in the past explored the influence of harmonious passion on employees' creativity while the influence caused by obsessive passion on innovative behavior was unknown. Therefore, the study includes both harmonious passion and obsessive passion to discuss the effect on innovative behavior from both types of passion; (2) Very little research in the past explored the mediating mechanism of work passion on innovative behavior. As a result, the study aims to explore whether different types of work passion have impacts on positive mood or negative mood of employees and further affect innovative behavior.

Literature Review and Hypotheses

The effect of passion types on innovative behavior

Work passion has been regarded as a kind of attitude (Ho et al., 2011; Vallerand et al., 2010). Scholars Vallerand et al. (2003) defined it as the strong psychological inclination shown on the time and energy that an individual devotes to a work item which is liked and thought important. In fact, scholars Vallerand et al. emphasized in relevant research that self-identification was an important factor to form passion because people were enthusiastic about participating in specific activities in order to develop and ensure self-identification ((Lee, Shafer, & Kang, 2005). Burke and Reitzes (1991) also believed self-identification was the standard and the reference point of human's behavior. However, the passion defined by scholars Vallerand et al. was not included into the concepts of self-identification (Cardon et al., 2009). The study further defines it as the strong psychological inclination shown on the time and energy that an individual devotes to a work item which is liked and thought important in order to establish self-identification so that to reflect the true meaning of work passion.

It is known from above definition that work passion includes both the elements of affection and recognition. The dimension of affection catches the concept of strong liking in work fun while the dimension of recognition catches the awareness of the importance of the work on individuals, and these cause individuals to internalize work itself as self-identification (Ho et al., 2011). In order to

further understand the true meaning of work passion, the study conducts the comparison of this concept with the concept of engagement. Engagement is a concept of motivational construct and it is used to describe individual's positive working, the fulfillment of personal ambition, and the status of affective motivation brought by work, including three sub dimensions of vigor, dedication, and absorption (Schaufeli & Bakker, 2004). From both definitions, it reveals the following differences between work passion and engagement. First, work passion is a kind of attitude while engagement is a kind of motivation. Second, engagement, different from work passion, is lack of the concept of affection, which is the basic element of fondness and fun among passion. In other words, people who are high engagement are not necessarily the ones who love their work. Therefore, work passion is actually different from the concept of engagement.

The concept of passion was rarely attracted attention at the area of psychology in the past (Ho et al., 2011), and it was almost only focused on the positive encouragement of passion while lack of the discussion in the dimension of affection (Frijda et al., 1991; Goldberg, 1986). However, there was still research in the past pointed out the negative results that passion might cause (Branzei & Zietsma, 2003；Rony, 1990). Therefore, scholars Vallerand et al. (2003) focused on the process of individual's internalization of work activities to self-identification in order to clarify multiple dimensions of passion, and classified passion into harmonious passion and obsessive passion according to different internalization processes.

Harmonious passion is originated in autonomous internalization and it means that individuals determine the importance of work activities freely under the situation of individual autonomy and further internalize the work activities that individuals are passionate about into self-identification. This type of passion allows work to be engaged freely and flexibly according to willingness without affecting by any additional conditions (Vallerand et al., 2003). Instead of affecting other dimensions in life, the work complements and regulates the other dimensions in life and urge individuals to generate higher positive emotions (Vallerand et al., 2010). For example, a software R&D engineer with harmonious passion will devote into work activities according to willingness and he can decide when to write program and when to engage in other activities, such as further studying or participating in social activities, to further obtain a lot of fun and sense of satisfaction.

Obsessive passion comes from controlled internalization and it refers to individuals internalize

work activities that they are passionate about into personal identification. This type of passion is mainly the concerning of interpersonal or individual pressure, including self-esteem, social acceptability, and additional conditions along with work activities such as excitement (Vallerand et al., 2003). Although individuals like the work activities, it is easy to generate uncontrollable sense of devotion. Individuals tend to have higher negative emotions when they fail to balance with other activities (Vallerand et al., 2010). For example, a software R&D engineer with obsessive passion tends to care about the success and failure of work a lot. He thinks about programming for the whole day and even sacrifices his break time or the time spent with family to write programs. As a result, it easily causes him anxious and feeling guilty.

Scholars Vallerand et al. (2003) highlighted the two types of work passion show moderate positive correlation with each other, but it was still with discriminant validity. That is, passion is from the common basic element and therefore it shows positive relationship. However, through different internalization processes (autonomous internalization, controlled internalization), passion can be divided into two types- harmonious type and obsessive type and they cause positive and negative results respectively (Ho et al., 2011). According to the research in the past, harmonious passion had positive correlation with flow, positive affection, absorption, and subjective happiness but showed significant negative correlation with shame. Obsessive passion is mostly related to negative results, such as shame, negative recognition, and negative emotions (Carpentier, Mageau, & Vallerand, 2012; Philippe, Vallerand, & Lavigne, 2009; Vallerand et al., 2008; Vallerand et al., 2007 ; Vallerand et al., 2003).

“People” are the most precious resources in the organization and are the generators of all creativity. The encouragement of employee in enterprises to demonstrate innovative behavior has become an important issue in circles of academia and practice. Scholars Scott and Bruce (1994) defined innovative behavior as employee’s new creativity, new technique, or new manufacturing process development in the organization as well as transforming new creativity into behavior performance of practical products or services. Scholars believed the foundation of organization innovation was the devotion of employee on innovative behavior (Kanter, 1988; Scott & Bruce, 1994). In short, it will be helpful for organization innovation if personal innovative behavior can be strengthened (Amabile, 1988; Kanter, 1988).

When holding harmonious passion towards specific work activities, individuals can engage in work freely and flexibly according to willingness without being affected by additional conditions and further internalize the work activity into personal identification (Vallerand et al., 2003). Harmonious passion can urge individuals highly devote to the work activity and have higher controlling ability on the "time" and "level" devoted at the same time. Therefore, they can appropriately arrange time for work activities and other activities. When engaging in work activities, individuals are easy to concentrate and easy to feel flow experience. According to Csikszentmihalyi's flow theory (1988), individuals can accomplish creative achievement better under the status of flow. To put it differently, individuals can maintain high concentration when they engage in the work with harmonious passion and further benefit the presentation of innovative behavior. Thus, the study presumes the harmonious passion of R&D personnel has positive influence on innovative behavior.

When holding obsessive passion towards specific activities, individuals mainly focus on interpersonal or personal pressure or are affected by additional conditions and they usually engage in work overly and rigidly and further internalize the work activity into personal identification (Vallerand et al., 2003). In the past research, Liu, Chen and Yao (2011) used metal companies and commercial banks as samples and found negative relationship between obsessive passion and personal innovation. However, Luh and Lu's research using students at department of design (2012) revealed positive relationship between obsessive passion and personal innovation. The study believes the inconsistent results might be caused by the difference between research samples. When work content is routine and lack of challenges, obsessive passion will affect personal innovation negatively because the main work requirement is standardization instead of innovation. Moreover, the rigid devotion will block personal feeling in flow experience and generate sense of conflict. Nevertheless, obsessive passion will affect personal innovation positively when work content is full of challenging. The past research showed tangible rewards (materials, money..etc.) or invisible incentives (recognized by other people, self-esteem...etc.) would enhance individual's willingness in taking the risk of innovation (Csikszentmihalyi, 1988; Sternberg & Lubart, 1995). With special regard to R&D work that is with high challenges and high rewards, individuals tend to believe achieving other people's expectation or obtaining rewards is one of the methods to prove self-capability and establish self-identification; therefore, the willingness of devoting to innovative behavior is

enhanced. In other words, the level of devoting to innovative activities from individuals can be enhanced when engaging in work with obsessive passion and further benefit the presentation of innovative behavior. As a result, the study presumes the positive influence between the obsessive passion of R&D personnel and innovative behavior.

H1: The harmonious passion of R&D personnel has positive influence on innovative behavior.

H2: The obsessive passion of R&D personnel has positive influence on innovative behavior.

The effect of passion types on innovative behavior: mediating roles between positive mood and negative mood

A lot of research highlights affection is an important factor that affects the presentation of innovative behavior (Amabile et al., 2005; Fredrickson, 2001; Rhoades et al., 2001). Human's behavior is not only affected by recognition but also driven by affection (Brief & Weiss, 2002; Huy, 2002). Therefore, it is necessary to explore the processes of recognition and affection at the same time (Choi, Sung, Lee, & Cho, 2011). A lot of research reveals both positive mood and negative mood affect personal innovative behavior (George et al., 2007; Shalley et al., 2004）. Meanwhile, the research in the past also found it might be possible for positive mood and negative mood to be existed at the same time (Fong, 2006; George et al., 2007; Sy et al., 2005; Watson et al., 1985). Based on the argument above, the study includes both positive mood and negative mood as mediating variables in order to explain the process of individual's presentation in innovative behavior more comprehensively.

Fiske and Taylor (1984) believed individual's subjective experience feelings were collectively known as affect and it included the concepts of emotion and mood. Emotion refers to the short psychological and cognitive reaction caused by external stimulation that individuals encountered. It is a strong emotional status for a specific event or object, such as happy, sad or furious (Ortony et al., 1988). Compared to emotion, mood refers to the long-term emotional status that is transferred from emotion by individuals. It is usually nothing related to situation, no specific and without objectivity (Ashkanasy, 2003). The study mainly discusses whether different types of work passion can affect innovative behavior through the mediating variables in the dimension of affection. The source of

affection among it is not specific and without objectivity. Consequently, the study asked subjects to recall the emotional status that they experienced in the past two weeks and used the term of "mood" to collectively called individual's experience feelings at working situations.

Moods are typically described as having either a positive or negative valence (Ashkanasy, 2003; Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001; Watson & Tellegen, 1985). Watson and Tellegen (1985) claimed positive mood and negative mood were two independent dimensions separately and the results generated were not asymmetric. Positive mood refers to a kind of subjective happiness that individuals feel (Watson、Clark & Tellegen ,1988). When feeling higher positive mood, individuals will show energetic towards life and show coldness and no energy when feeling lower positive mood (Weiss & Cropanzano, 1996). On the contrary, negative mood refers to a kind of subjective unhappiness that individuals feel (Watson、Clark & Tellegen ,1988). When feeling higher negative mood, individuals show angry, nervous and anxious; while feeling lower negative mood, individuals show gentle and satisfying (Weiss & Cropanzano, 1996).

Although the empirical research that explored passion revealed harmonious passion actually enhanced positive mood while obsessive passion caused negative mood (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Philippe et al., 2010; Vallerand et al., 2003; Vallerand et al., 2006), the research in the past failed to explain clearly how passion types affected positive and negative mood that individuals felt. Therefore, the study explained it based on Heise's affect control theory (1985). According to the theory, affection is a kind of meaningful signal to regulate the interaction process between specific environment and self-identification. In fact, self-identification is not only a single concept but it is included self-identification developed from various activities or situations (such as self-identification on leisure activities, self-identification on interpersonal relationship). In the end, self-identification at work is actually a part of overall self-identification (Alexander& Wiley, 1987; Crocker, 1999; Hormuth, 1990; Stryke, 1990). If being enthusiastic about a specific work activity is helpful for stabilizing or enhancing overall self-identification, the individual will generate positive mood. On the other hand, the individual will generate negative mood if being enthusiastic about a specific work activity will block overall self-identification (Cardon et al., 2009). That is to say, when individuals hold harmonious passion towards specific activities, they can face

the work they are passionate about and other activities in flexible and open attitudes. They will establish multiple self-identifications by participating in various activities. That is why harmonious passion is good at balancing overall self-identification. Individuals can confirm self-meaning and self-value through different activities and further generate positive mood of satisfaction and happiness. On the contrary, individuals tend to engage in the work that they are passionate about overly and rigidly when they hold obsessive passion on specific work activities. However, focusing on work activities too much will exclude opportunities of participating in other activities and it is not good at balancing overall self-identification (Cardon et al., 2009). Though being enthusiastic at work activities helps individuals equipped with highly self-identification at work, the self-identification related to other activities in life show unstable status instead. Individuals generate negative mood of self-blaming, anxiety and sense of guilty in order to reduce the uncertainty towards self-meaning or self-value.

In developing the influence of positive mood on innovative behavior, we learnt it from broaden-and-build theory of emotions that positive affection could expand the sudden ideas and action proposals that individuals accommodate and make thoughts flexible and more creative (Fredrickson, 2001). A lot of research in the past also proved positive mood was actual good for employees' innovative capabilities (Fredrickson, 1998; Matlin & Stang, 1979; Murray, Sujan, Hirt, & Sujan, 1990; Schwarz, 2000; Showers & Cantor, 1985). Fredrickson (1998) also found positive mood could provide wider scope of acceptance and equip individuals with the capability of linking things in distance together and further increase creativity. Beside, Isen (1999) also addressed positive mood could enhance the complexity and flexibility of thinking mode, promote the combination of a wide range of elements, and fulfill innovative behavior. On the other hand, broaden-and-build theory of emotions also revealed positive affection is good for individual's self-development, improve interpersonal interaction and establish friendship (Waugh & Fredrickson, 2006) because people tend to be attracted by the positive mood that released by individuals and increase opportunities of interaction with each other (Dovidio, Gaertner, Isen, & Lowrance, 1995; Johnson & Fredrickson, 2005). That is, positive mood is good for individuals to establish good interpersonal relationship and help individuals obtain a lot of relevant resources. Hence, good interpersonal relationship is not only good for the composition and execution of innovative thoughts and problem solving but also helpful

for individuals to obtain more support and have higher confidence in presenting innovative behavior.

With regard to developing the effect of negative mood on innovative behavior, a lot of research believed negative mood would block employee's innovative abilities (Higgins, Qualls, & Couger, 1992; Martindale, 1989; Matthews, 1986; Okebukola, 1986; Strauss, Hadar, Shavit, & Itskowitz, 1981; Vosburg, 1998). However, negative mood was good for convergent thinking and problem-solving ability under some context (Kaufmann, & Vosburg, 1997, 2002). In empirical research, George and Zhou (2007) found negative mood would affect creativity positively when positive mood was high and innovation supporting atmosphere was high, and the creativity reached the peak when both positive mood and negative mood were high. The study used R&D personnel in high-tech companies as research samples. Their work content is to generate and fulfill new ideas (Krause, 2004). Although it is with higher challenge of work, it can satisfy the demands of self-fulfillment and self-identification at the same time. In terms of the sample features of the study, the negative mood caused by obsessive passion on R&D personnel instead affected innovative behavior positively. In summary, the study presumes positive mood will mediate positive relationship between harmonious passion and innovative behavior while negative mood will mediate positive relationship obsessive passion and innovative behavior.

H3: Positive mood will mediate the positive relationship between harmonious passion of R&D personnel and innovative behavior.

H4: Negative mood will mediate the positive relationship between obsessive passion of R&D personnel and innovative behavior.

RESEARCH METHOD

Conceptual framework

The conceptual framework of the study is as the figure shown below.

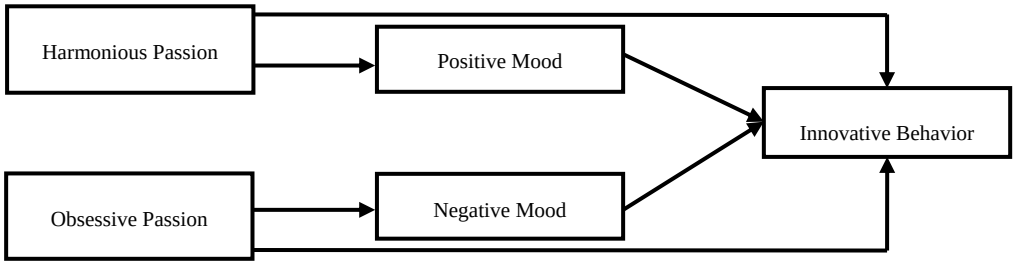

Figure 1 Diagram of conceptual framework

Research subjects and testing procedure

The study selected high-tech companies of industries in communications, information, consumer electronics, semiconductor, precision machinery, automation, advanced materials for aerospace, specialty chemical, pharmaceutical, health care, and pollution control based on the definition of high-tech industries provided by Industrial Development Bureau, Ministry of Economy and used R&D personnel as the objects to hand out questionnaire with the anticipation of controlling difference among industries through samples from single industry (Delery & Doty,1996). The study conducted purposive sampling method and used R&D managers and R&D personnel as matched samples. Each R&D manager was paired with 3 to 5 R&D personnel with total 103 questionnaires issued to R&D managers and 400 questionnaires issued to R&D personnel. The recall of the questionnaires was completed within 2 months after issuances and there were 280 matched questionnaires returned. After deducting invalid questionnaires that were incomplete or with very high consistency, there were 267 valid matched questionnaires with return rate of 66.8%.

The basic information of effective sample respondents is as below. Male is the leading gender of R&D personnel (77..2%); in terms of age, group of 26-30 years old (43.1%) is with the largest amount of people followed by the group of 31-35 years old (27.3%); in terms of educational background, postgraduate or above is the most (56.2%) followed by university (34.8%); in terms of working hours per week, group of 41-50hr is the first (58.1%); as for final total working years, the group of 1-3 years is the first (27.0%) followed by the group of 5-10 years (22.8％).

RESEARCH TOOL

Work passion

The passion scale developed by scholars Vallerand and Mageau et al. (2003) was divided into two sub scales of “harmonious passion” and “obsessive passion”. There are 7 questions for harmonious passion (example: My work won’t be conflict with my life) and 7 questions for obsessive passion (example: I am afraid of losing the job). It is scored by 7-point of Likert scale (1= strongly disagree, 7= strongly agree). The Cronbach’s α value is 0.86 and 0.84 respectively and it achieves

acceptance of more than 0.70, showing good internal consistency of the scale (Nunnally, 1978).

The overall model test revealed the reliability of ideas composition is 0.90 for harmonious passion and 0.87 for obsessive passion. They are greater than the standard value of 0.60 (Fornell & Larcker, 1981) and it shows the scale is with good internal consistency. In terms of average variance extracted, harmonious passion is 0.57 and obsessive passion is 0.53. They all achieve the standard of 0.50 suggested by Fornell and Larcker (1981) and it shows the scale is with a certain level of convergent validity.

Positive and negative mood

PANAS scale was produced by Watson, Clark and Tellegen (1988) and it was divided into "positive mood" and 'negative mood". There are 10 questions related to positive mood (example: positive, excited) and 10 questions related to negative mood (example: frustrated, anxious). It is scored by 5-point of Likert scale (1= strongly disagree, 5= strongly agree). The R&D personnel in high-tech industries recalled the emotional status in the past two weeks and its Cronbach's α values are both 0.88 and achieve acceptance value of more than 0.70; it shows the good internal consistency of the scale (Nunnally, 1978).

The overall model test revealed the reliability of ideas composition is 0.91 for positive mood and 0.90 for negative mood. They are greater than the standard value of 0.60 (Fornell & Larcker, 1981) and it shows the scale is with good internal consistency. In terms of average variance extracted, positive mood is 0.50 and negative mood is 0.49. They all achieve the standard of 0.50 suggested by Fornell and Larcker (1981) and it shows the scale is with a certain level of convergent validity.

Innovative behavior

The innovative behavior scale developed by Scott and Bruce (1994) is with 6 questions in total (example: In order to launch new ideas, this employee will design and propose proper plans). It is scored by 5-point of Likert scale (1= strongly disagree, 5= strongly agree) and it is responded by the direct manager of the R&D personnel. The Cronbach's α value is 0.87 and it achieves acceptance of more than 0.70, showing good internal consistency of the scale (Nunnally, 1978). The overall model

test reveals the reliability of ideas composition is 0.90 and it is greater than the standard value of 0.60 (Fornell & Larcker, 1981) and it shows the scale is with good internal consistency. The average variance extracted is 0.61 and it achieves the standard of 0.50 suggested by Fornell and Larcker (1981) and it shows the scale is with a certain level of convergent validity.

Control variables

The past research believed demographic variables might affect the relationship between work passion and innovative behavior (Shalley et al., 2004; Vallerand et al., 2003). The study took the research in the past as reference and included age, gender, educational background, total working years, and working hours every week into control variables (Ho et al., 2011; Liu et al., 2011) to avoid the interference from external variables.

Data analysis

The study adopted descriptive statistics analysis to describe the features of the samples. The correlation among key variables in conceptual framework were discussed by Pearson Correlation before verifying the validity of scale with confirmatory factor analysis, and then verified the main effect of the study in hierarchical regression analysis. In the end, the mediating path relationship of the study hypotheses was verified in structural equation model.

RESULT OUTCOMES

Correlation coefficient analysis

The mean, standard deviation, and correlation coefficient of each variable in the study are shown in Table 1. Harmonious passion and obsessive passion (r=.71, p<.01), positive mood (r=.64, p<.01), and innovative behavior (r=.17, p<.01) are all with significant positive correlation while negative mood (r=-.20, p<.01) appears to be significant negative correlation. Obsessive passion shows significant positive correlation with positive mood (r=.48, p<.01), negative mood (r=.13, p<.05) and innovative behavior (r=.13, p<.05) while positive mood shows significant negative correlation with negative mood (r=-.20, p<.01) and significant positive correlation with innovative behavior

(r=.20, p<.01).

Overall model fit

Confirmatory factor analysis shows the estimated t-value of parameters in each question is greater than 3.29 and achieves the significant level of 0.01. In terms of model fit, CFI and IFI are all 0.89 and NNFI is 0.88; each value meets the standard of greater than 0.80. SRMR is 0.08 and it also meets the standard of less than0.10 (Zhang, et al., 2003). Besides, the value of RMSEA is 0.11 and it is close to the standard value of 0.10 suggested by scholars (Browne & Cudeck, 1993). To sum up, the value of overall model fit meets the acceptable scope.

The main effects of passion types on innovative behavior

TABLE 1 Correlation analysis

Variable	M	SD	1	2	3	4
Harmonious passion	4.77	.98				
Obsessive passion	4.16	1.01	.71**			
Positive mood	3.38	.55	.64**	.48**		
Negative mood	2.60	.66	-.20**	.13**	-.20**	
Innovative behavior	3.51	.59	.17**	.13**	.20**	-.02**

Note: 1. * p < .05 ; ** p <. 01 (N=267) 2. M is mean and SD is standard deviation

The study uses statistical software of SPSS17.0 version to conduct analysis, and the results of hierarchical regression analysis is shown in Table 2. Mode 2 shows significance was achieved

between harmonious passion and innovative behavior (β=.168, p < .01). Therefore the hypothesis 1 in the study is valid, which means the higher the employee's harmonious passion level is, the more innovative behavior generated.

Moreover, we can see from mode 3 that significance was also achieved between obsessive passion and innovative behavior (β=.135, p < .05). Therefore, the hypothesis 2 in the study is also valid, which means the higher the employee's obsessive passion level is, the more innovative behavior generated.

TABLE 2 Hierarchical regression analysis

Dependent variable: Innovative behavior			
Predictor variables	Mode 1	Mode 2	Mode 3
Control variables			
Gender	.088	.062	.061
Age	.014	-.092	-.044
Educational background	.020	.199**	.202**
Working hours per week	.005	.076	.061
Total working years	.001	.182	.149
Main effect variables			
Harmonious passion		.168**	
Obsessive passion			.135*
R2	.052	.080	.070
F	2.884	3.775***	3.276**
ΔR2		.028**	.018*
ΔF		7.849**	5.016*

Note: 1. * p < .05 ; ** p <. 01 ; ***p<.001 (N=267) 2. Values in the table is the standardized β-value

The effect of passion types on the overall model of innovative behavior path

The study uses statistical software of LISREL8.7 version to conduct analysis. According to the result of structural equation model, the model verification of the study hypotheses reveal the value of χ2 is 3100.31 (df=735), CFI value is 0.89, NNFI value is 0.88, GFI value is 0.63, and RMSEA value is 0.11. The values all meet or are close to the acceptable standards, and it shows the overall model is acceptable. Besides, the study adopts the suggestion by Bentler and Bonettt (1980) and uses multi-nested mesh model in order to achieve rigorousness of the study. Chi-square test was applied on perfect mediation and part mediation to determine which model has the highest fit with various data, and that model is the optimality model.

The chi-square value of simplified perfect mediation is 1.35 greater than the chi-square value in complicated part mediation, and the difference in degree of freedom is 2. There is no significant difference shown on chi-square test (P>.05) and it reveals the fit of part mediation is not significantly better that the fit in perfect mediation. Based on principle of parsimony, the study presumes perfect mediation is better than part mediation.

TABLE 3 Nested model analyses

Model	χ2	df	χ2/df	Δχ2	Δdf
Perfect mediation	3100.31	735	4.22		
Part mediation	3098.96	733	4.23	1.35	2

Note: * p<.05, **p<.01, ***p <.001

In terms of the effect of harmonious passion on the path of innovative behavior, we can see from Table 4 that the direct effect of harmonious passion on positive mood is 0.77(p<.001). It achieves the level of significance, and it means harmonious passion will positively affect positive

mood. The direct effect of positive mood on innovative behavior is 0.21 (p<.001), and it also achieves significance. That is, positive mood will positively affect innovative behavior. In order to secure the rigorousness of the study again, the study further examined by Sobel Test to find out whether harmonious passion has indirect effect on innovative behavior through positive mood. With regression analysis, positive mood is predicted by harmonious passion and then adds harmonious passion and positive mood at the same time to predict innovative behavior. Sobel Test is conducted with the non-standardized regression coefficients obtained from the 2 regression analyses and its standard error. The result shows Z value is 3.25(P<.001), meaning it achieves statistical significance. Therefore, it supports hypothesis 3, which means harmonious passion will enhance innovative behavior through positive mood.

In terms of the effects of obsessive passion on the path of innovative behavior, we can see from Table 4 that the direct effect of obsessive passion on negative mood is -0.01(p>.05) and it fails to achieve significance. The direct effect of negative mood on innovative behavior is -0.01 (p>.05), and it also fails to achieve significance. Therefore, the hypothesis 4 of the study is not supported, which means negative mood as the mediating variable for the effects of obsessive passion on innovative behavior is invalid

TABLE 4 Standardized coefficients of perfect mediation

Path	Standardized coefficient	t-value
Harmonious passion→ Positive mood	.77***	10.88
Obsessive passion→ Negative mood	-.01	.10
Positive mood→ Innovative behavior	.21***	3.21
Negative mood→ Innovative behavior	-.01	.08

Note: *p<.05, **p<.01, ***p <.001

In the past decades, a huge amount of research has been trying to find out the antecedent

causes that caused innovative behavior in order to develop effective methods to strengthen employees' innovative behavior (Amabile, 1988; Janssen et al., 2004; Mumford, 2000; West, 2002). Even though work passion is generally existed on the employees of the enterprises, very little research focused on the relationship between work passions and innovative behavior. In order to respond the research gap in the past research, the study explores the relationship between the types of work passion and innovative behavior of employees.

When holding harmonious passion towards specific work activities, individuals can engage in work freely and flexibly according to their willingness without being affected by additional conditions and further internalize the work activity into personal identification (Vallerand et al., 2003). Harmonious passion helps individuals highly devote to the work activity and they have better control on the "time" and "level" devoted. Therefore, they can arrange time for work activities and other activities properly. When individuals engage in work activities, they are easy to be concentrated and even easier to feel the experience. Csikszentmihalyi's flow theory (1988) suggested individuals can accomplish creative achievements even better when they are under flow status. In conclusion, the study extended the above research findings related to work passion and reveals R&D personnel who hold high harmonious passion towards specific activities are actually able to generate higher innovative behavior.

When holding obsessive passion towards specific activities, individuals mainly concern interpersonal pressures or the pressure inside the individual or it might be affected by external additional conditions. They usually engage in work overly and rigidly and further internalize the work activity into personal identification (Vallerand et al., 2003). When work content is routine and lack of challenging, obsessive passion will affect personal innovation negatively because the main work requirement is standardization instead of innovation. Moreover, the rigid devotion will block personal feeling in flow experience and generate sense of conflict. Nevertheless, obsessive passion will affect personal innovation positively when work content is full of challenging. The past research showed tangible rewards (materials, money...etc.) or invisible incentives (recognized by other people, self-esteem...etc.) would enhance individual's willingness in taking the risk of innovation (Csikszentmihalyi, 1988; Sternberg & Lubart, 1995). With special regard to R&D work that is with high challenges and high rewards, individuals tend to believe achieving other people's expectation or

obtaining rewards is one of the methods to prove self-capability and establish self-identification; therefore, the willingness of devoting innovative behavior is enhanced. The empirical results of the study find employees who hold high obsessive passion towards specific activities are actually able to generate higher innovative behavior. That is to say, the level of devoting to innovative activities from individuals can be enhanced when engaging in work with obsessive passion and further benefit the presentation of innovative behavior.

A lot of research in the past highlighted positive mood will in fact positively affect employees' innovative abilities (Fredrickson, 1998; Matlin & Stang, 1979; Murray et al., 1990; Schwarz, 2000; Showers & Cantor, 1985) because positive mood provides wider scope of acceptance and equip individuals with capabilities of linking things in distance together (Fredrickson, 1998). Broaden-and-build theory of emotion suggests positive mood can expand sudden ideas and action proposals that individuals accommodate and make thoughts flexible and with more creativity (Fredrickson, 2001). Meanwhile, it is good for individuals to expand self-development, promote interpersonal interaction, and establish friendship (Waugh & Fredrickson, 2006) because other people are easy to be attracted by the positive mood released by individuals and further increase the opportunities of interaction with each other (Dovidio, Gaertner, Isen, & Lowrance, 1995; Johnson & Fredrickson, 2005). In conclusion, the study extended the above research findings and finds R&D personnel who hold high harmonious passion towards specific activities are actually able to generate higher positive mood and further contribute to the presentation of higher innovation.

The research results of the study find negative mood doesn't have mediating effect towards the relationship between R&D personnel's obsessive passion and innovative behavior. The study offers the following explanation about the above finding. The study uses R&D personnel in high-tech companies as the research sample and the work content of high-tech R&D personnel is basically to generate and fulfill new ideas (Krause, 2004). This type of work is usually with features of high rewards, high autonomy and high challenging. When high obsessive passion involves, R&D personnel tends to believe achieving other people's expectation or obtaining high amount of rewards is one of the methods to prove self-capability and establish self-identification instead of generating higher negative mood and further increase the devotion of innovative behavior. As a result, obsessive passion does not enhance innovative behavior through negative mood in the sample of R&D

personnel; instead, it might use external motivation or self-worth as mediating variables. In other words, the occupational features of high rewards, high autonomy and high challenging can be excluded if other professions are used as research samples. Obsessive passion might cause individuals to weaken their creative ideas through negative mood and further enhance the presentation of innovative behavior. Therefore, the study suggests future research can explore with samples in different industries and job duties and compare the research results.

Managerial Implication

Include work passion into the consideration of R&D personnel recruitment. Although the study result indicated the two passion types both enable individuals to present innovative behavior, harmonious passion can stimulate individuals to present more innovative behavior in better quality. On the other hand, R&D personnel with obsessive passion will define themselves through work activities and believe work is part of self-identification formulation (Lee, Shafer, & Kang, 2005; Vallerand et al., 2003). The main concern is interpersonal pressures or the pressure from themselves, and thus it tends to generate the uncontrollable sense of devotion. According to the relevant research in the past, obsessive passion caused individuals fail to look after other activities and generated higher negative results (Vallerand et al., 2010) and it also ruined interpersonal relationship and led to the reduction of emotional commitment and subjective happiness (Forest, Mageau, Sarrazin, & Morin, 2011; Vallerand et al., 2003). These negative results might affect other members in the team and cause negative influence on innovation of the team or even innovation in the organization. Therefore, it is suggested to include the concept of work passion into recruitment process in practice; finding out the passion of engaging in R&D through reviewing the working experience in the past and the inquiry of what makes R&D interesting. After the completion of interview, a complete job description must be offered to make sure applicants fully understand work content and its challenges. To sum up, the study suggests including work passion into the consideration of R&D personnel recruitment in order for individuals or teams to accomplish creative achievements.

Increase R&D personnel's sense of achievement at work in order to enhance harmonious

passion. Work passion was seen as a kind of attitude (Ho et al., 2011; Vallerand et al., 2010) and it changed along with environment or time. Individual's attitude can be changed through the change of recognition and learning. For R&D, it is very important to generate high-quality innovative ideas. Therefore, it is suggested managers and HRM personnel should try their best to promote R&D personnel's sense of achievement at work in practice and make them aware of their contribution at work in order to enhance the harmonious passion. In practice, managers are able to empower their subordinates the opportunities and flexibility of decision making. In addition, managers should timely offer positive feedback on the work devotion and contribution from R&D personnel. When the feedback is unexpected and irregularly, it effectively enhance employees' recognition towards work value even better and further enhance its harmonious passion. When the positive feedback from managers is expected and regular, the nature of feedback itself might become a kind of intrinsic pressure; instead of increasing the sense of achievement at work, individuals tend to generate pressure of their own. In summary, the study suggests managers to enhance R&D personnel's sense of achievement at work through empowering as well as unexpected and irregular positive feedback and further enhance their harmonious passion.

Promote and maintain R&D personnel's positive mood in order to facilitate innovative behavior. The study finds harmonious passion will affect innovative behavior through positive mood. In order to further enhance individual's innovative behavior, we can try to make sure R&D personnel feels stronger positive mood other than increasing R&D personnel's harmonious passion to achieve the goal of enhancing innovative behavior. First, in the level of managers and subordinates, the past research revealed employees' mood at work would be affected by the mood of their managers (Schwarz & Clore, 2003; Sy et al., 2005). If managers have better mood adjustment ability and are able to adjust their bad mood rapidly and turn it into the status of positive mood, employees will be able to generate more positive feelings when they feel the mood of their managers. It is suggested in practice that enterprises should offer more emotional management related courses for managers to further study in order to reinforce their capabilities in mood adjustment and management. Moreover, in terms of employees, organizations should encourage teams to establish workplace friendship. According to the research in the past, individual's positive mood can be enhanced in the circumstance of high workplace friendship (Sias,

Smith & Avdeyeva, 2003). In practice, it is suggested managers or HRM personnel to create more opportunities for team members to communicate and interact. However, it should avoid this kind of interaction becoming a mere formality in order to establish workplace friendship and further enhance R&D personnel's positive mood.

Future Research

Most research in the past focused on positive results of passion but ignored negative impact caused by passion (Frijda, Mesquita et al., 1991; Goldberg, 1986), including negative emotion, the reduction of emotional commitment and subjective happiness caused by broken interpersonal relationship (Forest et al., 2011; Vallerand et al., 2003). Through the classification of work passion types, we can clearly understand that passion does not always bring positive effects. Different types of work passion held by individuals not only generate positive behavior but also bring negative behavior. According to the relevant empirical research in the past, obsessive passion caused negative distraction (Vallerandet al. 2003) and ruminative thoughts (Ratelle et al. 2004; Carpentier, Mageau, & Vallerand, 2012). Consequently, the study suggests researchers in the future to continue exploring other outcome variables that are affected by the types of work passion other than the innovative behavior discussed in the study, and compare the differences between the two types of work passion at the same time.

According to the literature review of the study, the differences of research samples might affect the results of the study. When work content is routine and lack of challenges, obsessive passion will negatively affect personal innovation because the requirements for the main work is standardization instead of innovation. No willingness of innovation will be generated during the process of individual's high involvement with work. Moreover, rigid devotion will block individual's feeling of flow experience and further impede individual to generate innovative behavior. When work content is full of challenging, obsessive passion will positively affect personal innovation because innovation is one of the major work requirements. Individuals believe achieving other people's expectation or obtaining rewards is one of the methods to prove self-capability and establish self-identification and further enhance the willingness of devoting to innovative

behavior.

On the other hand, negative mood is not the mediating mechanism of obsessive passion affecting innovative behavior, but the high correlation (r=.71) between the two types of passion might be affected by sample features. The descriptive statistics of the study reveals R&D personnel with education background above university (included) is 90% of total sample size and 77.2% of total sample size is with working hours per week more than 40Hr. R&D personnel with high educational background and high working hours account for very high percentage, and the differences with job characteristics of other types are indeed existed. In conclusion, the study suggests future research exploring research samples with different types or sampling research samples with different types at the same time to review whether different effects will be generated between work passion and innovative behavior under different job characteristics.

The study adopts the passion scale developed by scholars Vallerand and Mageau et al. (2003) and it is divided into two sub scales of “harmonious passion” and “obsessive passion”. Although the resourced scale is with good reliability and validity, some question items are similar with the concepts of balance between work and family or workaholic after translation, In terms of the result of factor analysis, though factor loadings meet the standards suggested by scholars (Hair et al., 2006), some of factor loadings are between 0.30 and 0.35, which is in the downward side. The study uses reversing method and passed the test of expert validity, but it still has potential problems in construct validity. Therefore, we suggest researchers in the future to produce a more appropriate work passion scale to avoid the problem.

Limitation of The Study

Tai-Kuang Peng, Yueh-Tzu Kao, and Cheng-Shen Lin (2006) believed the problem of common method variance (CMV) will be occurred when using self-report scale. For this, the source of information in the study is divided into two parts of R&D personnel and R&D managers, and paired them with each other as a copy of complete questionnaire to return. Meanwhile, the study hides research purpose and names of variables from respondents as well as randomly arrange the variables that are to be measured (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff &

Organ, 1986) to avoid respondents from guessing and congruent motivation. In addition, the questionnaire should be completed in anonymous form to reduce subject's psychological expectations and distraction during the test.

No matter it is harmonious passion or obsessive passion, it is actually originated from the common basic elements of affection and high devotion. Research in the past highlighted moderate positive correlation existed between the two types of work passion, but it was still with discriminant validity (Vallerand, 2003). After literature review, the study revealed different sample features affected the correlation between the two types of passion. In Luh and Lu's empirical research (2012) using students at department of design as samples, the correlation (r=.61) between harmonious passion and obsessive passion is significantly higher than that in the research using large-scale service companies as samples done by scholars Forest et al. (2011). The study uses high-tech R&D personnel as research objects and their work content needs to generate lots of new ideas and accomplish it. It is more similar with the sample features of students at department of design. As a result, the relevant analytical results of the study find the correlation between harmonious passion and obsessive passion is on the higher side (r=.71). On the other hand, a moderate to high correlation also showed among harmonious passion, obsessive passion and positive mood (r=.48~.64). In order to ensure each scale distinguish from level, the study evaluated discriminant validity analysis on each scale. The analytical results show good discriminant validity in each scale and the correlation among constructs won't affect research results (Fornell & Larcker, 1981).

In order to find out the correlation among variables, the study uses cross-sectional study method. Therefore, all the information and relevant data only reflect the situation of each research variable at the moment of testing and are not able to provide more strict evidence of cause-effect relation. As a result, cross-sectional study might not be able to judge factors that affect dependent variables in a long time. In conclusion, the study suggests relevant research in the future can consider longitudinal analysis in order to confirm ratiocination of time difference and between cause-effect relations.

REFERENCES

Tai-Kuang Peng, Yueh-Tzu Kao, and Cheng-Shen Lin (2006); Common method variance in management research method: the root of the problem, influence, testing and supplement; *Journal of Management,* 23(1), 77-98.

Ajzen, I., & Fishbein, M. (1980).*Understanding attitudes and predicting social behaviour.* Englewood Cliffs, NJ:Prentice-Hall.

Alexander, Jr., C. & Wiley, M. G. (1987). *From situated activity to self-attribution: The impact of social structural schemata.* In K. Yardley & T. Honess (Eds.), Self and identity: Psychosocial perspectives (pp. 105–118). New York: John Wiley & Sons.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in organizational behavior*, 10, 123-167.

Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, 50(3), 367-403.

Anderson, J. C., & Gerbing, D. W. (1998). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423.

Ashkanasy, N. M. (2003). Emotions in organizations: A multi-level perspective. Multi-Level Issues in *Organization Behaviors and Strategy*, 2, 9-54.

Bentler, P. M., & Bonett, D. G.., 1980. Significance Tests and Goodness of Fit in the Analysis of Covariance Structures. *Psychological bulletin*, 88(3), 588.

Boyatzis, R., McKee, A., & Goleman, D. (2002). Reawakening your passion for work. *Harvard Business Review*, 80(4), 86-94.

Branzei, O., & Zietsma, C. (2003). *Entrepreneurial love: The enabling functions of positive illusions in venturing*, Paper presented at the Babson-Kauffman Entrepreneurial Research Conference, Wellesley,

MA.

Brief, A. P., & Weiss, H. M. 2002. Organizational behavior: Affect in the work place. *Annual Review of Psychology*, 53(1), 279-307.

Browne, M. W., & Cudeck, R. (1993). *Alternative ways of assessing model fit*. In K. A. Bollen & J. S. Long (Eds.), Testing structural equation models (Vol. 154, pp. 136-162). Newbury Park, CA: Sage.

Bierly, P. E., Kessler, E. H., & Christensen, E. W. (2000). Organizational learning, knowledge, and wisdom. *Journal of Organizational Change Management*, 13, 595–618.

Burke, P. J. & Reitzes, D. C. (1991). An identity theory approach to commitment. *Social Psychology Quarterly*, 54(3), 239–251.

Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *The Academy of Management Review*, 34(3), 511-532.

Carpentier, J., Mageau, G. A., & Vallerand, R. J. (2012). Ruminations and flow: Why do people with a more harmonious passion experience higher well-being? *Journal of Happiness Studies*, 13(3), 501-518.

Choi, J. N., Sung, S. Y., Lee, K., & Cho, D. S. (2011). Balancing cognition and emotion: Innovation implementation as a function of cognitive appraisal and emotional reactions toward innovation. *Journal of Organizational Behavior*, 32(1),107-124.

Crocker, J. (1999). Social stigma and self-esteem: Situational construction of self-worth. *Journal of Experimental Social Psychology*, 35(1), 89–107.

Csikszentmihalyi, M. (1988). *Society, culture, and person: A systems view of creativity*. In R. J. Strenberg (Ed.), The nature of creativity. Cambridge, UK: Cambridge University.

Delery, J.E. & Doty, D.H.(1996). Modes of theorizing in Strategic human resource management: tests of universalistic, contingency and configurational performance predictions, *Academy of Management Journal*, 39(4),802-835.

Dovidio, J. F., Gaertner, S. L., Isen, A. M., & Lowrance, R. (1995). Group representations and intergroup bias: Positive affect, similarity, and groupsize. *Personality and Social Psychology Bulletin*, 21, 856–865.

Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology*, 86(1), 42-51.

Facteau, J., Dobbins, G., Russell, J., Ladd, R., & Kudisch, J. (1995). The influence of general perceptions of the training environment on pretraining motivation and perceived training transfer. *Journal of Management*, 21, 1.

Forest, J., Mageau, G. A., Sarrazin, C. &; Morin, E. M. (2011). "Work is my passion": The different affective, behavioural, and cognitive consequences of harmonious and obsessive passion toward work. *Canadian Journal of Administrative Sciences*, 28(1), 27-40.

Fong, T. C. (2006). The effects of emotional ambivalence on creativity. *Academy of Management Journal*, 49, 1016-1030.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300-319.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218-226.

Frijda, N. H., Mesquita, B., Sonnemans, J. & Van Goozen, S. (1991). *The duration of affective phenomena or emotions, sentiments and passions*. In K. T. Strongman (Ed.), International review of studies on emotion (Vol.1, pp. 187-225). New York: Wiley.

George, J. M., & Zhou, J. (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management*

Journal, 50, 605-622.

Goldberg, C. (1986). The interpersonal aim of creative endeavor. *The Journal of Creative Behavior*, 20(1), 35-48.

Greenhalgh, T., Robert, G., Bate, P., Macfarlane, F., & Kyriakidou, O. (2005). *Diffusion of innovations in health service organisations: A systemic literature review*, Oxford,UK: BMJ Books, Blackwell.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis*(6th ed.). Upper Sadde River, New Jersey: Prentice-Hall.

Heise, D. R. (1985). Affect control theory: Respecification, estimation, and tests of the formal model.*Journal of Mathematical Sociology*, 11, 191–222.

Higgins, L. F., Qualls, S. H., & Couger, J. D. (1992). The role of emotions in employee creativity. *Journal of Creative Behavior*, 26, 119-129.

Ho, V. T., Sze-Sze, W., & Chay Hoon, L. (2011). A tale of passion: linking job passion and cognitive engagement to employee work performance. Journal of Management Studies, 48(1), 26-47.

Hormuth, S. E. (1990). *The ecology of the self: Relocation and self-concept change*. Cambridge: Cambridge University.

Huy, Q. N. (2002). Emotional balancing of organizational continuity and radical change: The contribution of middle managers. *Administrative Science Quarterly*, 47(1), 31-69.

Isen, A. M. (1999). *Positive affect*. In T. Dalgliesh & M. J.Power (Eds.), Handbook of cognition and emotion (pp. 521-539). Chichester, England: John Wiley & Sons Ltd.

Janssen, O., Van De Vliert, E., & West, M. (2004). The bright and dark sides of individual and group innovation: A Special Issue introduction. *Journal of Organizational Behavior*, 25(2), 129-145.

Johnson, K. J., & Fredrickson, B. L. (2005). “We all look the same to me”:Positive emotions eliminate the own-race bias in face recognition. *Psychological Science*, 16, 875–881.

Kanter, R. M. (1988). When a thousand flowers bloom: Structural, collective, and social conditions

for innovation in organization. *Research in Organizational Behavior*, 10, 169-211.

Kaufmann, G., & Vosburg, S. K.(2002). The effects of mood on early and late idea production. *Creativity Research Journal*, 14(3&4), 317-330.

Kaufmann, G., & Vosburg, S. K. (1997). "Paradoxical" mood effects on creative problem solving. *Cognition and Emotion*, 11(1), 151–170.

Krause, D. E. (2004). Influence-based leadership as a determinant of the inclination to innovate and of innovation-related behaviors : An empirical investigation, *The Leadership Quarterly*, 15, 79-102.

Lee, B., Shafer, C. S., & Kang, I. (2005). Examining relationships among perceptions of self, episode-specific evaluations, and overall satisfaction with a leisure activity. *Leisure Sciences*, 27(2), 93-109.

Liang, J.,C. Farh, C. I., & Farh, J.-L. (2012). Psychological antecedents of promotive and prohibitive voice: A two-wave examination. *Academy of Management Journal*, 55(1), 71-73.

Liu, D., Chen, X.P., & Yao, X. (2011). From autonomy to creativity: A multilevel investigation of the mediating role of harmonious passion. Journal of Applied Psychology, 96(2), 294-309.

Luh, D.-B., & Lu, C.-C. (2012). From cognitive style to creativity achievement: The mediating role of passion. *Psychology of Aesthetics, Creativity, and the Arts*, 6(3), 282-288.

Mageau, G. A., Vallerand, R. J., Rousseau, F. L., Ratelle, C. F., & Provencher, P. J. (2005). Passion and gambling: Investigating the divergent affective and cognitive consequences of gambling. *Journal of Applied Social Psychology*, 35(1), 100-118.

Martindale, C. (1989). *Personaility, situation, and creativity*. In R. R. J. Glover, & C. R. Reynolds (Eds.), Handbook of creativity (pp. 211-232).New York: Plenum.

Matlin, M. W., & Stang, D. (1979). *The Polyanna Principle: Selectivity in language, memory, and thought*. Cambridge, MA: Schenkman.

Matthews, G. (1986). The effects of anxiety on intellectual performance: When and why are they

found? *Journal of Research in Personality*, 20(4), 385-401.

Moses, B. (2001). *It's all about passion*. Across the Board, 38(3), 55-58.

Mumford, M. D. (2000). Managing creative people: Strategies and tactics for innovation. *Human Resource Management Review*, 10(3), 313-351.

Murray, N., Sujan, H., Hirt, E. R., & Sujan, M. (1990). The influence of mood on categorization: A cognitive flexibility interpretation. *Journal of Personality and Social Psychology*, 59(3), 411-425.

Nunnally, J. (1978). *Psychometric theory*. New York: McGraw-Hill.

Okebukola, P. A. (1986). Relationships Among Anxiety, Belief System, and Creativity. *Journal of Social Psychology*, 126(6), 815-816.

Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions*. New York: Cambridge University.

Philippe, F. L., Vallerand, R. J., Houlfort, N., Lavigne, G. L., & Donahue, E. G. (2010). Passion for an activity and quality of interpersonal relationships: The mediating role of emotions. *Journal of Personality and Social Psychology*, 98(6), 917-932.

Philippe, F. L., Vallerand, R. J., & Lavigne, G. L. (2009). Passion Does Make a Difference in People's Lives: A Look at Well-Being in Passionate and Non-Passionate Individuals. *Applied Psychology: Health and Well-Being*, 1(1), 3-22.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects *Journal of Management*, 12(4), 531-544.

Ratelle, C. F., Vallerand, R. J., Mageau, G. A., Rousseau, F. L., & Provencher, P. (2004). When passion leads to problematic outcomes: A look at gambling. *Journal of Gambling Studies*, 20(2), 105–119.

Rhoades, L., Eisenberger, R., & Armeli, S. (2001). Affective commitment to the organization: The contribution of perceived organizational support. *Journal of Applied Psychology*, 86(5), 825-836.

Rony, J.-A. (1990). *Les passions [The passions]*. Paris: Presses Universitaires de France.

Ryan, R. M., & Deci, E. L. (2003). *On assimilating identities to the self: A self-determination theory perspective on internalization and integrity within cultures*. In M. R. Leary & J. P. Tangney (Eds.), Handbook on self and identity(pp. 253-274). New York: The Guilford.

Schaufeli, W. R., & Bakker, A. B. (2004). Job demands and job resources and their relationship with burnout and engagement: A multiple sample study. *Journal of Organizational Behavior*, 25, 293-315.

Schwarz, N., & Clore, G. L. (2003). Mood as information: 20 years later. *Psychological Inquiry*, 14, 296-303.

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580-607.

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6), 933-958.

Showers, C., & Cantor, N. (1985). Social cognition: A look at motivated strategies. *Annual Review of Psychology*, 36(1), 275.

Sias, P. M., Smith, G., & Avdeyeva, T. (2003). Sex and sex-composition differences and similarities in peer workplace friendship development. *Communication Studies*, 54(3), 322-340.

Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York: Free Press.

Strauss, H., Hadar, M., Shavit, H., & Itskowitz, R. (1981). Relationship between creativity, repression, and anxiety in first graders. *Perceptual and Motor Skills*, 53(1), 275-282.

Stryker, S. (1990). *Symbolic interactionism: Themes and variations*. InM. Rosenburg,&R. H. Turner (Eds.), Social psychology: Sociological perspectives (pp. 3–29). New York: Basic Books.

Sy, T., Côté, S., & Saavedra, R. (2005). The contagious leader: Impact of the leader's mood on the mood of group members, group affective tone, and group processes. *Journal of Applied Psychology*, 90, 295-305.

Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., Gagné, M., & Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85(4), 756-767.

Vallerand, R. J., Paquet, Y., Philippe, F. L., & Charest, J. (2010). On the Role of Passion for Work in Burnout: A Process Model. *Journal of Personality*, 78(1), 289-312.

Vallerand, R. J., Rousseau, F. L., Grouzet, F. M. E., Dumais, A., Grenier, S., & Blanchard, C. M. (2006). Passion in sport: A look at determinants and affective experiences. *Journal of Sport and Exercise Psychology*, 28(4), 454-478.

Vallerand, R. J., Salvy, S.-J., Mageau, G. A., Elliot, A. J., Denis, P. L., Grouzet, F. M. E., & Blanchard, C. (2007). On the Role of Passion in Performance. *Journal of Personality*, 75(3), 505-534.

Vosburg, S. K. (1998). The effects of positive and negative mood on divergent-thinking performance. *Creativity Research Journal*, 11(2), 165.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, 98(2), 219-235.

Waugh, C. E., & Fredrickson, B. L. (2006). Nice to know you: Positive emotions, self-other overlap, and complex understanding in the formation of new relationships. *Journal of Positive Psychology*, 1(2), 93–106.

Weiss, H. M., & Cropanzano, R. (1996). *Affective events theory: A theoretical discussion of the*

structure, causes and consequences of affective experiences at work. In B. M. Staw & L. L. Cummings (Eds.), Research in Organizational Behavior(Vol. 18, pp. 1–74). Greenwich, CT: JAI.

West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovationimplementation in work groups. Applied Psychology: An International Review, 51(3), 355-387.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*, 18(2), 293-321.

Zhang, Q., Vonderembse, M. A., & Lim, J.-S. (2003). Manufacturing flexibility: Defining and analyzing relationships among competence, capability, and customer satisfaction. *Journal of Operations Management*, 21(2), 173.