THE ROLES OF WORK MOTIVATION AND JOB INVOLVEMENT ON THE RELATIONSHIP BETWEEN CONTEXTUAL FACTORS AND CREATIVE BEHAVIOR

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ABSTRACT

The main purpose of this study was to investigate the factors that influence creative behavior among Malaysian researchers. Specifically, it investigated the mediating effect of work motivation on the relationships between the contextual factors, namely stressors, autonomy, culture, reward and supervisory style on creative behavior; the effect of work motivation on creative behavior; and the moderating effect of job involvement on the relationships between stressors, autonomy, culture, reward and supervisory style, and work motivation. Creativity is considered as the seed of innovation, where innovativeness has been considered as one of the fundamentals for organizational competitiveness. Acknowledging the importance of creative behavior on innovation, this study was carried out to investigate its predictors, and to include work motivation as the mediating factor and job involvement as the moderating variable between the contextual factors and work motivation. Accordingly, this study was based on the self-determination theory (SDT) and the organizational support theory (OST) to position the possible relationships between the variables in the research framework. A total of 201 researchers, representing a response rate of 40.8%, participated in this study. Data were collected via questionnaires. PLS-SEM was used to analyze the data and test the hypotheses. This study found that the level of creative behavior among the researchers was high. Statistical results showed that the relationship between stressors, work motivation, creative behavior as well as the relationship between autonomy, work motivation and creative behavior were supported. Work motivation was also found to be positively related to creative behavior. Empirical support was also found for the moderating effect of job involvement on the relationships between stressors and supervisory styles and work motivation. The theoretical and practical implications alongside recommendations for future research are discussed.

Keywords: creative behavior, work motivation, job involvement, contextual factors and self-determination theory

ABSTRAK

Tujuan utama kajian ini adalah untuk mengkaji faktor-faktor yang mempengaruhi tingkah laku kreatif dalam kalangan penyelidik di Malaysia. Secara khususnya, ia bertujuan untuk mengkaji kesan pengantara motivasi kerja pada hubungan antara faktor-faktor kontekstual iaitu stressor, autonomi, budaya, ganjaran dan gaya penyeliaan dengan tingkah laku kreatif; kesan motivasi kerja terhadap tingkah laku kreatif; dan kesan penyederhana penglibatan kerja pada hubungan antara stressor, autonomi, budaya, ganjaran dan gaya penyeliaan dengan motivasi kerja. Kreativiti dianggap sebagai asas kepada inovasi yang mana inovasi dianggap sebagai salah satu perkara yang penting bagi daya saing organisasi. Menyedari akan kepentingan tingkah laku kreatif ke atas inovasi, kajian ini dijalankan untuk mengkaji faktor-faktor yang menyumbang kepada tingkah laku kreatif; dan motivasi kerja sebagai faktor pengantara, serta penglibatan kerja sebagai faktor penyederhana antara faktor-faktor kontekstual dan motivasi kerja. Oleh itu, kajian ini dilaksanakan berdasarkan kepada teori penentuan diri dan teori sokongan organisasi untuk memeta dan meletakkan hubungan antara pemboleh ubah dalam rangka kerja penyelidikan. Seramai 201 orang penyelidik telah terlibat dalam kajian ini dan iamewakili kadar respons sebanyak 40.8%. Data kajian telah dikumpul melalui kaedah soal selidik, manakalaperisian PLS-SEM telah digunakan untuk menganalisis data dan menguji hipotesis. Dalam kajian ini, didapati bahawa tahap tingkah laku kreatif dalam kalangan para penyelidik adalah tinggi. Keputusan statistik menunjukkan bahawa hubungan antara stressor, motivasi kerja,tingkah laku kreatif serta hubungan antara autonomi, motivasi kerja dan tingkah laku kreatif adalah disokong. Motivasi kerja juga didapati mempunyai hubungan yang positif dengan tingkah laku kreatif. Manakala sokongan empirikal juga memberi kesan penyederhana terhadap penglibatan kerja pada hubungan antara stressor dan gaya penyeliaan dengan motivasi kerja. Implikasi teoretikal dan praktikal serta cadangan kajian pada masa hadapan turut dibincangkan dalam kajian ini.

Kata kunci: tingkah laku kreatif, motivasi kerja, penglibatan kerja, faktor-faktor

Kontekstual dan teori penentuan diri

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LIST OF ABBREVIATIONS

STD	Self-determination Theory
OST	Organizational Support Theory
S & T	Science and Technology
R & D	Research and Development
AVE	Average Variance Extract
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
EFA	Exploratory Factor Analysis
PLS	Partial Least Square
PLS-SEM	Partial Least Square Structural Equation Modelling
SD	Standard Deviation
SE	Standard Error
SPSS	Statistical Package for Social Science
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Organizations worldwide depend on their ability to create, improve, and sustain their competitive advantage to ensure their long-term survival (Ford & Gioia, 1995; Lopez-Claros, Altinger, Blanke, Drezniek & Mia, 2007). It can be argued that one of the ways companies can achieve their competitive advantage is through the acts of innovation (Chen & Kaufmann, 2008; Mumford, 2000), which include introducing new technologies and new ways of doing things, new product designs and also new production processes, new marketing approaches as well as a new way of conducting training.

Although the extent to which an organization is able to innovate and sustain its competitive advantage is determined by multiple factors, innovation is often rooted in the creative ideas of individual employees (George & Zhou, 2001; Mumford, 2000). The agenda of creating, sustaining, and improving competitive advantage through people motivates organizations to discover various alternatives to employ the full potential of their employees. One of the alternatives is through enhancing employees' creativity. Enhancing employees' creativity is considered a necessity for any organization to succeed (Amabile, 1988; Kanter, 1983; Kim, 2000; Shalley, 1995). Employees who are highly creative and innovative are the most invaluable resources that can help organizations generate new ideas and produce useful

outcomes as well as implementing them (Oldham & Cummings, 1996; Kim 2000).

Malaysia is an emerging Asian economy, aspiring to move ahead towards becoming another newly industrializing economy (NIEs) in Asia. Malaysia enjoys a relatively stable economic growth and has the potential to emulate the success of NIEs such as Singapore, Taiwan, Republic of Korea and Hong Kong. Malaysia depends on science and technology (S & T) to drive the nation's socio-economic growth towards a developed nation status by the year 2020 (Ninth Malaysian Plan, 2004; Rasiah & Chandran, 2015). Through sound and effective S & T strategy, the nation will be able to develop innovation that will enhance the nation's competitive advantage (Ninth Malaysian Plan, 2004). Malaysia is currently in the Third National Science and Technology Policy (2013–2020) that emphasizes on the importance of the generation and utilization of knowledge; initiation of talent development program; energizing innovation in industry; and improving the governance framework for S & T.

The Malaysian government has identified the quality of the nation's human capital as the most critical element to support the development of its S & T strategy (Rasiah & Chandran, 2015). Human capital is the crucial driver of growth in the country's concerted effort toward building a knowledge-based economy and information-rich society that will enable the nation to effectively compete with some of the best nations in the world (Mumford, 2000; Lim, 2004; Rasiah, 2014). In this context, it has to rely on its human capital to provide creative and innovative ideas, concepts, and insights to move ahead (Lopez-Claros et al., 2007; Schwab & Sala-i-Martin, 2014).

Currently, Malaysia is undergoing the second phase of economic development (Lopez-Claros et al., 2007; Schwab & Sala-i-Martin, 2014). Although Malaysia is on the verge of embarking the third stage of making technological breakthrough particularly in biotechnology and nanotechnology, the country still has a long way to go and major obstacles need to be addressed. There are a number of issues particularly related to creativity and creative endeavors that have undermined Malaysia's capacity to successfully attain its aim to become a high-income, knowledge-based economy and an industrialized nation by the end of the decade.

First, is to address the issue relating to the nation's competitiveness. It is relevant to discuss the issue on the nation's creativity utilizing the Global Competitiveness Report (GCR) since the GCR has included a measure on economic creativity that captures the ability of a country to continuously renovate and improve its productive activities (Economic and Social Progress in Latin America Report, 2001). According to the Global Competitiveness Index (GCI), Malaysia is now ranked at number 25 for the year 2016-17, slipped from the 20th position in the previous 2014-2015 ranking. With this current ranking, Malaysia's position is consistently lagging behind the Asian tigers. Singapore fares at a comfortable position of number two, Hong Kong at number nine, and Taiwan is ranked 14th. Other countries that have surpassed Malaysia such as such United Arab Emirates ranked at the 16th position and Qatar which is currently placed at number 18. These two nations have surpassed Malaysia in the competitiveness raking for the first time in the year 2009 and this remains in the 2015-17 ranking. Table 1.1 shows the ranking.

Table 1.1
World Competitiveness Report: Ranking for Year 2016-2017

Country/Economy	**GCI 2016-2017**		**GCI 2014-**
	Rank	Score	**2015** Rank*
Switzerland	1	5.81	1
Singapore	2	5.72	2
United States	3	5.70	3
Germany	4	5.57	5
Sweden	5	5.57	10
United Kingdom	6	5.53	9
Japan	7	5.49	6
Netherlands	8	5.48	8
Hong Kong SAR	9	5.48	7
Finland	10	5.44	4
Norway	11	5.44	11
Denmark	12	5.35	13
New Zealand	13	5.31	17
Taiwan, China	14	5.28	14
Canada	15	5.27	15
United Arab Emirates	16	5.26	12
Belgium	17	5.25	18
Qatar	18	5.23	17
Austria	19	5.22	22
Luxembourg	20	5.20	20
France	21	5.20	24
Australia	22	5.19	23
Ireland	23	5.18	25
Israel	24	5.18	27
Malaysia	25	5.16	20
Korea, Rep	26	5.03	26

The implication of this ranking is that although Malaysia has received largely positive assessment, Malaysia is not yet in the same league as dynamic Asian

economies such as Singapore, Taiwan and Hong Kong, or the Asian tigers with which it is often compared. There are many issues and challenges yet to be addressed and properly managed. Malaysia has scored relatively low on some of the important measures in the innovation and creativity indices such as expenditures on R & D, technological readiness and innovation to support its economic creativity and competitiveness.

The expenditures on R & D for Malaysia as reported between 2008 and 2012 rose from 0.79% to 1.13% of GDP (Rasiah & Chandran, 2015). Despite this progress, this allocation is regarded relatively small when compared to the expenditures on R & D of Korea and Singapore that are 4.03 percent and 2.00 percent respectively of the country's GDP. Other indices that should be taken into consideration are the scores on technological readiness and innovation since the two indices captured the economic creativity of a country. Malaysia's technological readiness is relatively low and ranked at the 43rd position compared to Singapore ranked at the 9th position and Korea which ranked at number 28th. This shows that Malaysia is lagging in terms of technology invention and transfer. In addition, based on the innovation index, Malaysia ranked at the 43rd position and this is considered one of the problematic factors for Malaysia and posed as a major challenge yet to overcome by the country. Both Singapore and Korea on the other hand, were ranked at better positions that are 9th and 20th respectively. These scores show that Malaysia is quite behind in terms of the nation's capacity for creativity and innovation.

Second is to discuss the issues that are directly related to the researchers' creativity in Malaysia. These issues are related to the measures of creativity such as creative

productivity index (CPI), number of researchers, patents and scientific contributions through publications and citation that could possibly reflect the level of creativity among Malaysian researchers. According to the report by The Economist Intelligence Unit for the Asian Development Bank (2014), the Malaysian economy is average in terms of creativity and innovation. This is explained by the CPI that measures how efficient an economy is in transforming creative inputs (e.g. R & D, share of FDI in total investment, enrollment in technical and vocational programs and enforcing contracts) into creative outcomes (e.g. number of patents, scientific publications, books, films and agricultural value added) (Creative Productivity Index, 2014).

Currently, Malaysia is ranked at the 13th position out of the 24 economies evaluated in the CPI. Although has been ranked lower by one position in the GCR, Korea is ranked at the third position in CPI and regarded as having very high level of creative productivity (Creative Productivity Index, 2014). Being evaluated as having a medium level of creative productivity, Malaysia has a lot of rooms for improvement particularly in certain problematic areas such as R & D, patents and scientific publications.

As discussed earlier, Malaysia's spending on R & D is considered relatively low. There were also many issues that arise in the area of R & D. Many of the issues targeted in the first two S & T policies have resurfaced in the third S & T policy, implying that many of the objectives for the second policy were not attained yet particularly the objective that was related to the current level of R&D and innovation (Rasiah, Yap & Salih, 2015). Malaysia is still a net technology importer, as its

royalties from technological licensing and services have remained negative while private sector participation in R & D has risen considerably since 2005, its share was still quite low in comparison with other dynamic Asian economies such as Singapore and Korea (Creative Productivity Index 2014; Rasiah, Yap & Salih., 2015). R & D spillovers have not been significant, despite the strong presence of multinational corporations in Malaysia. This is due to the lack of a critical mass of R & D infrastructure especially that concerns human capital and laboratories specializing in frontier R & D at research universities and government-owned institutions (Rasiah, 2014). Furthermore, the involvement of multinational corporations in frontier R&D is still limited in Malaysia and R & D conducted by both national and foreign firms is largely confined to product proliferation and problem-solving (Rasiah & Chandran, 2015). Little return on investment in R & D with low commercialization rate is also another concern yet to be addressed (Chandran & Yong, 2011; Rasiah & Chandran, 2015).

Apart from issues on R & D, Malaysia also shows average performance in other creative outputs such as number of patents and scientific publications. Patent applications with the Malaysian patent office increased steadily over the years (from 2007 to 2013) and according to the World Intellectual Property Organization (WIPO), in 2013, the number of patent application was 7, 205 (Rasiah & Chandran, 2015). This number, however lags far behind other dynamic Asian economies particularly Korea (204 589 patent applications in 2013). Moreover, within Malaysia, the domestic applications seem to be of lower quality with the accumulated of grants-to-application of only 18% as compared to 53% for foreign applicants for the period of between 1989 and 2014 (Rasiah & Chandran, 2015). In

terms of scientific publication, statistics published by SCImago (2015) showed that for the period of 1996 to 2015, Malaysia was ranked at the 35th position with the number of citable documents of 181 251, citations of 175 146, citations per document ratio of 4.9 and h index of 190. The statistics showed that Malaysia still lags behind compared to other Asian economies such as Korea which was ranked at number 12 with 824839 citable documents, 801077 citations, 10.28 citations per document ratio and h index of 476.

Lastly is the issue that is related to the trends in human resources. One of the many human resources issues that is relevant is researcher intensity. Malaysia's share of full-time equivalent (FTE) researchers per million inhabitants was 1,780 in 2012 and this number has grown steadily but remains fairly low for a dynamic Asian economy like Malaysia compared to Korea that had 5 380 researchers per million inhabitants and Singapore 5,153 researchers per million inhabitants.

Brain drain is another issue that remains a worry and has yet to be addressed. For Malaysia, it is suggested that the skilled diaspora is now three times bigger than two decades ago and has negatively implicates the human resource pool and slowed progress in S & T (Rasiah & Chandran, 2015). Given the issues and challenges faced by Malaysia, a more concerted effort towards overcoming these challenges should be taken and one of the ways to do this is by harnessing the talents and creativity of its human capital.

1.2 Problem Statement

Creative behavior has been identified as one of the most important aspects of human performance considered critical for successful innovations in organizations (Chen & Kaufmann, 2008; Petty & Guthrie, 2000). Despite various attempts made by previous researchers to explain the concept, an integrated framework to explain creative behavior at work is still lacking. In this study, self-determination theory (SDT) is applied toward this end. SDT is a social psychological theory that could potentially explicate individual outcomes that are self–directed and autonomous such as creative behavior. In fact, SDT has been used in previous studies to explain job performance (e.g. Baard, Deci & Ryan, 2004; Gagne, 2003; Greguras & Diefendorf, 2009; Parfyonova, 2009) and specifically creative performance (e.g. Kim, 2000; Phelan, 2001).

SDT sets the framework to understanding creative behavior. It proposes that contextual factors are important in determining creative behavior. This theory emphasizes the importance of stimulants in the environment or the context in triggering work motivation and, hence, enhancing individual positive outcome such as creative behavior (Deci & Ryan, 1985; Ryan & Deci, 2000). As a general framework, however, SDT does not explicitly specify what those contextual factors are. Hence, organizational support theory (OST) is invoked to help identify those factors. OST generally says that the organization should provide the support system to facilitate the accomplishment of an individual's job performance. This also implies that the organizational support system should help remove hindrance or obstacles that could hamper such performance. The use of OST is apt because the

theory generally asserts that when employees perceive that the organization supports them, they will reciprocate by demonstrating high job performance (Eisenberger, Huntington, Hutchinson & Sowa, 1986) such as displaying creative behavior at work.

Organizational support can take a variety of forms and types. But the relevant literature on creativity suggests that supervisory style and autonomy dimension of job characteristic are the two most salient factors that have the potential to influence work motivation and subsequently creative behavior. Therefore, the two variables will be examined to further validate their effect on creative behavior. In addition to these two types of organizational support, reward is purported to influence creative behavior albeit in a controversial manner. According to OST, favorable opportunities for rewards particularly in terms of recognition, pay, and promotions serve to communicate positive valuation of employees' contributions. Past studies have shown inconsistent findings of the effect of reward on creative behavior; whilst some found a positive effect; others revealed a contradictory result (e.g. Amabile, 1985; Eisenberger & Armeli, 1997, 1998; Eisenberger & Rhoades, 2001). Indeed because of the incongruent findings, previous works on creative behavior suggest that the effect of rewards on work motivation and hence creative behavior still needs further exploration. Hence, the variable rewards will be included in this study for further examination.

Although culture has been identified as an important contextual factor by OST, it has not been adequately addressed by previous researchers in the studies of creativity. Such neglect is unfortunate because organizational systems are infused by values and

beliefs also known as organizational culture, which produces cognitions and norms of behavior (Smircich, 1983). Deal and Kennedy (1982) asserted that corporate cultures particularly strong ones are the source of organizations' superior performance. In this study, a new variable that is innovation-oriented value culture (IOVC) will be examined for its potential impact on work motivation and creative behavior among employees.

While studies that used OST have generally considered the enabling or facilitating factors of job performance, few have actually considered the disabling factors together in a single study. Such limitation is unfortunate because different contextual factors may have different effects on job performance. In line with this argument, the present study attempts to examine both the enabling and disabling factors of creative behavior to understand to what extent they are significant in contributing towards the demonstration of creative behavior of employees at work. Organization support theory essentially proposes that organizations need to put in place a support system of various sorts to promote and enhance job performance. Such proposition can also be taken to mean that organizations need to reduce obstacles or hindrances that may suppress work motivation and hence hamper creative behavior. In this context, stressors have also been proposed by OST to influence motivation and creative behavior.

Stressors have been identified as one of the important determinants of creativity. Among the stressors that have been examined by researchers are competition, time pressure, role conflict, role overload, and evaluation of employee's performance (Amabile, 1979; Byron, Khazanchi & Nazarian, 2010). However there are

inconsistencies in the findings of previous studies on the relationship between stressors, motivation, and creative behavior. Therefore, this study attempts to further examine the role of stressors in determining motivation and subsequently creative behavior at work.

SDT also postulates that contextual factors are able to enhance creative behavior by motivating employees. However, the mere existence of contextual factors may not necessarily make employees feel motivated; whether or not they will be motivated depends on the situation they are in. This is another limitation of the SDT intended to be addressed in the study. By considering the situation, the theoretical understanding on the extent of influence of the contextual factors on motivation as a precursor to creative behavior can be enhanced. Whether or not contextual factors will further motivate employees to be creative depends on how involved they are in their job. Locke (1976) and Frone, Russell and Cooper (1995) argued that job involvement is a potentially important moderator of the relationship between job related experiences and individual work outcomes. Brown (1996), Kahn, (1990) and Pfeffer (1994) asserted that job involvement should be considered key in activating employee's motivation and effort, and subsequently determine creative behavior. For a highly involved person, the support in the environment will be regarded as an essential nutriment that could enhance his/her motivation (Kanungo, 1982; Blau & Boal, 1987; Diefendorff, Brown, Kamin & Lord., 2002; Rottenberry & Moberg, 2007) and later positively affect creative behavior. However, very limited attention has been given to studying the effect of job involvement on the relationship between predictors and creative behavior by researchers. Thus, job involvement will be examined as the moderating variable in this study.

Finally as suggested by Phellan (2001) and Navaresse (2008), research still needs to be conducted to further develop the concept of creative behavior in different organizational settings, across different cultures, and within different samples and population to further increase its generalizability and external validity (construct validation). The study of creativity in Malaysia is still at its infancy stage. To date, studies on creativity in Malaysia have been in the domain of education, conducted outside the boundaries of organization and used children and students as subjects (Palaniappan, 1993, 2000; Yong, 1994). Limited attempts have been made to explore creativity within the organizational context in Malaysia. Very few studies (e.g. Mohamed & Rickards, 1996; Mohamed, Richardson & Adam, 2002; Meriam, 2005) explored the issue of creativity within the Malaysian organizational context. Still, their studies are geared towards understanding the effect of creative climate on innovation and analyses were conducted at the organizational level. However, researchers such as Van de Ven (1986) and Subramaniam & Youndt (2005) insisted that invention or the conception of innovative ideas is an individual activity. As suggested by Rosabeth Moss Kanter (1983), to understand, creative effort, it is still valid to look at the individual since the person is the source of creative ideas and effort. Thus, a theoretical gap still exists and an attempt to explore creative behavior among Malaysian employees is hence required.

Based on the discussion above, this study attempts to fill in the existing gaps by extending the SDT framework and by examining the specific determinants of creative behavior as identified in the literature through the use of OST and by investigating the contingent role of job involvement in enhancing motivation and hence creative behavior. Thus, based on the above discussions, the study attempts to

find answers to the following questions and achieve the following objectives.

1.3 Research Questions

Based on the research gap, this study attempts to answer the following research questions:

a. To what extent do contextual factors identified by the OST are able to contribute to creative behavior at the workplace?

b. Does work motivation mediate the relationship between contextual factors and creative behavior?

c. Does job involvement moderate the relationship between the contextual factors and work motivation?

1.4 Research objectives

Specifically, this study aims to achieve the following objectives:

a. To determine the level of creative behavior amongst research employees in Malaysia.

b. To investigate the mediating effect of work motivation on the relationship between contextual factors and creative behavior of the researchers.

c. To investigate whether job involvement would moderate the relationship between contextual factors and work motivation of the researchers.

1.5 Significance of the Study

This study attempts to make several contributions to creativity and specifically creative behavior literature. First, this study attempts to offer an integrated

framework to explain creative behavior by employing SDT as the underlying theory. SDT sets a framework to explain that environmental or contextual factors need to be present to motivate individuals to demonstrate creative behavior (Deci & Ryan, 1985; Ryan & Deci, 2000). However, it has been argued that motivation does not exist in a vacuum. The existence of contextual variables alone may not be sufficient to trigger motivation. Whether or not a person is motivated depends also on the situation surrounding him/her (Deci & Ryan, 1985; Ryan & Deci, 2000). Given this argument, the present study attempts to examine the contingent effect of job involvement, in line with the assertion made by Brown (1996), Kahn (1990) and Pfeffer (1994), who argued that job involvement should be considered key in activating employee's motivation and this serves as the precondition of creative behavior.

Second, the study attempts to further enrich the understanding of creative behavior by proposing important and relevant antecedents. Since SDT provides a rather general framework, OST will be utilized to help refine the framework. According to OST, constant assessment of the organization and the job context will influence how an employee reacts to the organization (Eisenberger et al., 1989). Among the contextual factors deemed important by OST in affecting employees' motivation are supervisory styles, autonomy, rewards, and organizational culture. According to OST, the support system provided by the organization should help remove obstacles or hindrances to creative behavior. In this context, stressors that could potentially dampen creative behavior have received little empirical attention and hence are incorporated into the model to explicate creative behavior. Theoretically, it is hoped that this effort will offer a more comprehensive and integrated model that could help

explain creative behavior and thus enrich the existing literature.

Third, this research aims to benefit Malaysian corporations and government agencies and employees particularly to those involved in R & D activities. Peters and Waterman (1982), Porter (1998) and Woodman et al. (1993) considered innovation as the foundation towards developing and sustaining competitive advantage of organizations. Creativity, on the other hand is the starting point of innovation (Amabile, Conti, Coon, Lazenby & Herron, 1996). It is hoped that this study will provide information on important predictors of creative behavior and help the organizations develop the policies and job context that are conducive to the expression of creativity and creative behavior at the workplace.

1.6 Scope of the Study

For the purpose of this study, respondents were people who were directly involved in R & D known as R & D employees or in this research referred to as researchers. Employing the Frascati convention's classification of researchers using the occupation approach, researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and also in the management of the projects concerned (Frascati Manual, 2002). These professionals are mainly scientists in science and social science fields and also include managers and administrators engaged in the planning and management of the scientific and technical aspects of a researcher's work, postgraduate students at the PhD level engaged in R&D, as well as technician and equivalent staff participate in R&D by performing scientific and technical tasks (Frascati Manual, 2002). This group of people is selected due to the nature of their work that requires constant involvement

in invention and innovation. Moreover, the end products or the outcomes of these researchers and scientists' works are tangibles that can be evaluated as creative by experts in their respective areas. Therefore, the study will only focus on providing information on factors that potentially influence their motivation and subsequently affect creative behavior.

1.7 Definition of KeyTerms

1. Creative behavior is a construct that is defined as behavior that results in identifying original and better ways to accomplish some purposes (Shalley, 1991); and developing solutions to job related problems that are evaluated as new and appropriate for any given situation (Shalley,1995; Simon, 1985). There are three essential criteria that can be used to evaluate creative behavior: a) originality and newness of the behavior; b) the behavior is of value; c) must be a reflection of the creator's mind (Hayes, 1989 as cited in Kim, 2000).

2. Supervisory styles refer to either supportive supervision that shows concern for employees' feelings and needs, the encourage them to express their concern, provide informational and positive feedback and facilitates employee skill and development (Deci & Ryan, 1987; Oldham & Cummings, 1996) or the controlling style of supervision that demonstrate close monitoring of employee behavior, the practice of authoritative decision making and failure to demonstrate empathy towards employees (Amabile et al, 2004; Cummings & Oldham, 1997; Oldham & Cummings, 1996; Tierney , Farmer & Graen, 1999).

3. Job characteristics refers to the Hackman and Oldham (1976) job characteristic model. Job characteristics are defined as skill variety, task identity, task significance, autonomy, and feedback posited to affect individuals' experienced meaningfulness of the work, experienced responsibility of work outcomes, and knowledge about the results of their work activities. In this study, only the autonomy and feedback dimensions will be measured.

4. Innovation-oriented value culture is defined as one of the organizational culture dimensions described as the set of shared beliefs, values, heroes, assumptions, artefacts and rules that underlie an organization's creative identity that guide and dictate creative thinking, behavior and outcomes (Navaresse, 2008; Phelan, 2001; Quinn, 1988; Spreitzer, 1992).

5. Work stressors refer to factors in the environment particularly at the workplace that are harmful to an individual well-being such as conflicting demand, role overload, time constraint, role conflict, ambiguity in performing one's tasks and workplace hazard and conditions that causes anxiety, exhaustion, depression and burnout (Lepine, Podsakoff & Lepine, 2005).

6. Work Motivation can be broadly defined as a construct that pertains to the conditions and processes that account for the arousal, direction and maintenance of individual effort to engage in certain activities or to perform a job (Katzell & Thompson, 1990). Work motivation comprises both intrinsic and the enabling and informative aspects of extrinsic motivation.

7. Job Involvement refers to the degree to which one is cognitively preoccupied with, engaged in and concerned with one's present job (Paullay et al, 1994; Rottenberry & Moberg, 2007); the extent to which the individuals identify psychologically with his or her job (Kanungo,1982)

1.8 Organization of the Thesis

This thesis is divided into five chapters. Chapter one introduces the background of the study, states the problem statement, research questions and research objectives as well as explains the significance of the study, scope of the study and the organization of the thesis. Chapter two captures the literature review related to creative behavior, the underpinning theories, conceptualization of creative behavior and other variables pertinent in this study that are work motivation, job involvement and contextual factors (stressors, autonomy, reward, culture and supervisory styles). Chapter three discusses the research methodology while Chapter Four explains the data analysis process and results. Lastly, the discussions of the findings were presented in Chapter five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Scholars such as Peters and Waterman (1982), Porter (1998) and Woodman, Sawyer and Griffin (1993) considered innovation as the foundation towards developing and sustaining competitive advantage of an organization. Egan (2005) ascertained that fostering of innovation is a necessity for most organizations to keep in pace with the : (a) advancement in technology; (b) changing environment; (c) shifting of organizational directions and visions; (d) addressing competition; and (e) handling more sophisticated customer demands. Hence, innovation should be considered as inevitable for corporations operating in today's challenging and changing environment.

As discussed in the previous chapter, to tap on the issue of innovation, one important aspect that should be highlighted is creativity. Amabile, Coon, Lazenby and Herron (1996) argued that creativity is the starting point for innovation; it is in fact the seed of innovation. The process approach describes innovation as a multistage process that begins with problem recognition, generation of new ideas, building of coalition and finally completion of the idea (Scott & Bruce, 1994). It is suggested that creativity is required at all stages of the process particularly at the problem recognition and idea generation phase (Amabile et al., 1986; Kanter, 1998; Van de Ven, 1986; Scott & Bruce, 1994). To address the importance of creativity in supporting innovation, this

study aims to provide a comprehensive framework to examine the behavioral aspect of creativity that is creative behavior.

This chapter aims to provide discussions based on reviews of literature in the area of creativity that explain a theoretical basis for the study. Sections in this chapter will be divided into two major parts. The first part deals with defining and conceptualizing creativity and creative behavior. In addition, the discussion on the underpinning theory used as a foundation for the study will be presented in this section. The second part of this chapter is on review of past literature. Discussion on variables employed to explain creative behavior will be presented in this part of the chapter.

2.2 Creative Behavior and Performance

Motowidlo, Borman and Schmit (1997) and Sowden, Pringle and Gabora (2015) defined performance as "the total expected value to the organization of the discrete and aggregated behavioral episodes that an individual carries out over a standard span of time" (p.1). Based on the given definition, these assumptions have been derived: 1) performance is a multidimensional behavioral construct; 2) performance behavior is episodic, and 3) performance behavior episodes contain evaluative element. First, performance is regarded as a multidimensional behavioral construct because performance is the result of the interactions of individual factors and various variables in the environment. Good performance, hence, can be attributed to the excellent skills, knowledge and abilities of the person as well as to the conducive and supportive work environment. Secondly, a person will engage in a stream of behavior

at work. However, the episodic behavior is only considered when the person engages in behaviors that facilitate or hinder goal attainment. Other behaviors shown by the person will not be taken into consideration in determining performance since they are irrelevant for goal attainment. Finally, performance is an evaluative behavioral component. This means that behavior performed can either positively or negatively affect the effectiveness of individual and organizational goal attainment. Positive performance is desirable, thus contributes toward achievement of goals whereas negative performance is undesirable and hinders people from becoming effective in pursuing organizational goals. Motowidlo, Borman and Schmit (1997) and Hennessy (2015) argued that behavioral perspective is adopted because it provides a better explanation of performance as compared to the result perspective.

Apart from conceptualizing performance, another aspect of performance that can be discussed in order to grasp a better understanding of performance is by examining the taxonomy of the performance construct. Performance could be divided into a few types, depending on the conceptualization offered by different authors. Among the many conceptualizations, Motowidlo and Van Scotter (1994) and Motowidlo (2003) suggested that performance includes two classes of behavior: task and contextual. The concept of task performance refers to behaviors that lead towards the completion or production of goods and services offered by the organizations. Contextual performance on the other hand is the set of behaviors that either enable or inhibit organizational effectiveness by supporting the psychological, social and organizational context of work.

The overall employees' job performance depends on a number of behavioral factors,

of which task performance is recognized as one distinct facet of overall job performance (Borman & Motowidlo, 1993; Rapp, Bachrach & Rapp, 2013; Chiaburu, Oh, Wang & Stoverink, 2017; Viswesvaran & Ones, 2000). Task performance refers to the effectiveness with which employees perform activities that contribute to the organization's technical core either directly by implementing a part of its technological process, or indirectly by providing it with needed materials or services (Borman & Motowidlo, 1993; Borman & Motowidlo, 1997). It is widely recognized that a successful implementation of the technical core part of a job, including a focus on technical proficiency as a required part of the job (Borman, 1987) and a need to fulfill such mandatory or in-role job requirements (MacKenzie, Podsakoff, & Fetter, 1991) will be regarded as good performance (Chiaburu et al., 2017). Therefore, task performance encompasses behaviors that are job-specific.

Deci and Ryan (2000) and Motowidlo (2003) identify creative behavior as a special type of task performance. For some jobs, such as a researcher, creative behavior is explicitly separate from other behaviors and it represents proficiency in performing work tasks of a researcher. Researchers have to constantly engage in activities that required these researchers to bring unassociated or mutually remote ideas into contiguity so that previously unrealised relationships between them become apparent (Kapur, Subramanyam & Shah, 1997). Researchers such as Kapur, Subramanyam and Shah, 1997 and Sik (2016) claimed that novelty in itself however, is not enough to be labelled as creativity. The human mind is marvellously complex. At a time, there are several ideas and there will be mental processes to link these ideas into association. These processes may be termed as generative rules. Creativity occurs when there is a fundamental newness in the generative rules (Boden, 1992).

Furthermore, Koestler (1989) argued that as human grow up, they become creatures of habit. Their thinking, perception, emotions and actions in response to any given stimuli follow some predictable and repetitive patterns known as matrices. When two previously unrelated matrices are connected, a tension builds up. This is the process known as bisociation. The resolution of tension and the emergence of new meaning that follows the bisociation are referred to as creative act (Koestler, 1989; Paletz & Peng, 2008; Zwick, Frosch, Hoisl, & Harhoff, 2017).

The expression of creativity through creative act and behavior is a complex and intriguing process that involves the creation of fundamental newness and the emergence of new meaning. In performing one's job as a researcher, it is a requirement to be incessantly involved in these processes. To be creative is an in-role job requirements and core to a researcher's job. Therefore, creative behavior is a unique form of task performance. Creative behavior can be explained through the effect of the person and the environment. Creative behavior will also be looked at from the effectiveness of such behavior in attaining personal and organizational goals. In this study, creative behavior was examined as the dependent variable.

2.2.1 Creativity and Creative Behavior

Research on creativity started as early as 1960s. From that period onwards until the mid-1980s, most studies in creativity have been geared towards relating personal factors as predictors of creative behavior or performance. Researchers such as Kirton (1989), Parloff, Datta, Kleman and Handlon (1968), Terborg (1981), Torrance and Horng (1980) have examined various personal factors for instance personality,

thinking and learning styles and how these factors influence creativity. Starting from the late 1980s through 1990s, researchers adopted new approach in understanding creativity. Among seminal works being published are a series of studies conducted by Professor Amabile and her colleagues. Amabile has done a breakthrough in this area by applying the findings in the area of education to the workplace. As a result, a series of related studies conducted by Amabile and her companions (1985; 1988; 1989; 1990; 1996) and their contributions later facilitate the establishment of the Center for Creative Leadership. An important output of the collaboration between this center and Professor Amabile and her colleagues is the development of an instrument to assess work environment for creativity known as Assessing the Climate for Creativity Scale (KEYS).

Scholars and researchers at most times are at the disagreement of what creativity is. As a result, creativity yields various meanings and the definition of creativity varies from one author to another. Researchers too, have defined creativity differently based on how they contemplate the subject of creativity in their studies. Some researchers (e.g., Amabile, 1983;1996; Luescher, Barthelmess, Kim, Richter & Mittag, 2016; Glăveanu & Wagoner, 2016) believe that creativity is to come up with something 'totally novel' while there are scholars who think that creativity is something that has to do with incremental introduction of new ways of doing things. Some scholars would look at creativity as something that is unpredictable. Yet for others, creativity lies behind longevity and endurance or results only from lengthy and painstaking work (Amabile, 1996). Basadur (1995) described creativity as an inborn faculty in human being, thus considered as inherent ability that discriminates creative geniuses from the general population. On the other hand, social scientists propose that

creativity although an element of human factor, still could be nourished, cultivated and raised to extraordinary heights in virtually any attempt by human (Feldman, Csikszentmihalyi & Gardner, 1994).

J.P. Guildford, an eminent psychologist, is considered the first person to publicly address the concern to study creativity systematically. His 1950's presidential address to the American Psychology Association is considered a major impetus to the systematic study of creativity in psychology (Amabile, 1996). Consistent with the person-centred perspective of creativity, Guildford's definition of creativity emphasizes on the ability and trait of a creative person. Creativity is pertinent to creative personality and creative personality refers to the patterns of traits (i.e. aptitudes, interests, attitudes and temperamental qualities) of a creative person (Guildford, 1950 in Amabile, 1996; Feldman, Czikszentmihalyi & Gardner, 1994). Thus, creativity is the sole concern of a person.

Another alternative to define the concept of creativity is as suggested by Arthur Koestler. Koestler (1964) suggested creativity as a process known as bisociation which involves escaping the automated routines of thinking and behaving in order to reach new astral discoveries. He further argued that creativity comes into being only when subjective originality operates on the highest level of the hierarchies of existing knowledge. Based on his bisociation concept, Koestler later proposed that creativity can be defined as a deliberate effort to connect two seemingly unrelated trains of thoughts to come up with an invention or something new. The further refinement of the concept of creativity refers to what Koestler put forward as:

...the displacement of attention to something not previously noted, which was

irrelevant in the old and relevant in the new context: the discovery of hidden analogies as a result (1964, p.119).

In addition to Koestler's explanation, Amabile (1996) suggested that the bisociation process emphasizes the additive power of creativity. This additive power could be explained by looking at the knowledge discovery process. Knowledge discovered today will add information and facts to the existing knowledge that has been established from previous experience. Yet, the existing knowledge cannot be deleted from the established experience. Therefore, the bisociation process has the additive power of creativity.

As stated before, the concept of creativity has sparked interests as well as disputes among researchers on how to approach and understand the topic. Understanding creativity is challenging as the concept deals with something that is deem unknown to most people. Even scientists, inventors and artists who are constantly involve in creative effort are rarely able to identify where their creativity come from (Amabile, 1996). This explains the rather inconclusive, abstract and indefinitive nature of creativity. As a solution, Amabile suggested that creativity being determined by consensus in a way that:

... as long as the entity under consideration can be recognized with reasonably good consensus, it makes sense to proceed with scientific examination of that entity (1996, p. 19).

Thus, an outcome is considered creative when the domain regards it as creative and the outcome of individuals' performance can be examined in a systematic way.

Consequently, Amabile's argument provides a promising lead on ways to capture creativity in social psychology.

After discussing the concept of creativity, the next section will focus on the perspectives adopted by scholars to study the subject of creativity. Fleenor and Taylor (2003) and Amabile (1996) proposed that there are three major perspectives being adopted in the study of creativity that are: person, process or product approach. The person approach contemplates creativity as a fairly stable trait or characteristic developed by an individual at an early age. Process approach considers rational and logical thinking to be important for creative behavior. The product approach, on the other hand, concerns more on analysis of creative products and what make them different from less creative products. However, this rather segmented perspective could not provide a comprehensive explanation of creativity.

Apart from discussing the perspectives presented by scholars in studying creativity, another way to assess creativity is by looking at the research that has been conducted in this area. Research in creativity can be group into two categories. The first category consists of research about creative people and the processes within a person. Again, creativity is mainly a person's attribute. This means that what it is in your genes determine whether you are creative or not. The person's perspective of creativity has predominantly influence earlier studies in creativity (Cox 1926, in Amabile, 1996) and is still prevalent in present researches (Amabile et al., 1985; Brown, Jones & Leigh, 2005; Carson, Peterson & Higgins, 2003; Helson, 1996; Dollinger, 2003; McCrae, 1987; George & Zhou, 2001; Tierney & Farmer, 2002). Amabile (1996) suggests that earlier works intended to discover creativity are in the

forms of biographies and personal histories of creative individuals who are considered as exceptionally creative and successful in their respective fields. An example is the study on creative scientists and artists by McKinnon and Barron (Amabile, 1996). However, one major restriction of this perspective is the view that creativity is limited only to those who are gifted with the 'power' (i.e. brain) to be creative. Only these creative geniuses are capable of producing creative work and outcomes. Thus, creativity is pertinent only to the selected few regarded as creative individuals.

To understand a complex concept such as creativity, however, requires a more comprehensive explanation. The integrated perspective posits that human behavior is the result of constant and multi-directional interactions between personal variables and the context (Terborg, 1981; Feldman, Czikszentmihalyi & Gardner, 1994; Kim, 2000). Hence, creativity is not the sole concentration of creative people; rather, to come up with creative products, process, or solutions will be dependent on the ability, knowledge, and skill of a creative person as well as creativity inducing environment.

To fully capture the concept, creativity therefore could be examined as the results of the interactions between the domain, person and field in which the creative attempt occurs (Feldman, Czikszentmihalyi & Gardner, 1994). Domain refers to the formally organized body of knowledge that is associated with a given field that exists before any attempt was made to discover that particular knowledge (Feldman, Czikszentmihalyi & Gardner, 1994). A field refers to the element that makes up a domain. A field includes all people who can affect the structure of a domain and these people interact with each other to define the patterns and styles that evolve in a particular domain. According to Feldman, Czikszentmihalyi and Gardner (1994)

another element that is important in defining creativity is an individual or a person who is directly associated with the creativity endeavor. To put everything together, creativity should encompass the following definition: 1) something that is novel or new; 2) useful, that is accepted of having value that can improve the wellbeing of people; 3) create interest in the domain; 4) is the result of the interactions between a person, environment and the process that took place to produce the creative product.

The understanding of creativity will not provide adequate explanation in discussing the subject matter of this study. To research creativity from the highly philosophical and abstract nature would be fruitless particularly when studying creativity among employees at their workplace. The examination of the demonstration and expression of these creative ideas should be more useful when exploring creativity among people in their work context. Hence, in this study, creative behavior will be examined as the dependent variable.

Over the last decades, innovation and creativity have become critical skills for achieving success in developed economies. The need for creative problem solving has arisen as more and more management problems require creative insights in order to find suitable solutions. Creativity goes hand in hand with innovation. And there is no innovation without creativity. While creativity is the ability to produce new and unique ideas, innovation is the implementation of that creativity; that is the introduction of a new idea, solution, process, or product. Creativity is the driving force behind innovation and the incorporation of looking at things from a different perspective and freedom of restrictions by rules and written or unwritten norms (Feldman, Czikszentmihalyi & Gardner, 1994; Amabile & Pratt, 2016).

Creativity and innovation within well-run companies have always been recognized as a sure path to success. Stimulating creativity and exploring completely new and unknown before territories lead as result to increasing the productivity of the organisation. Encouraging the employees to think outside of the box and giving them time and resources to explore new areas for innovative ideas is the key to cost-effective business solutions (Amabile & Pratt, 2016).

Creativity improves the process of solving problems. It doesn't matter if we're talking about developing a new strategy or an innovative way to stay ahead of the competition. Creative problem solving gives that competitive edge that any business is striving to achieve. Creative ideas and innovative approaches can come from almost anywhere- from your partners, customers, target groups, employees. They can bring you fresh perspectives and ideas, so show them that you're listening and open to their feedback. That's why it is important an open exchange of ideas to be supported and encouraged by the company.

As stated before, creative behavior is a special type of task performance. Simon (1985) and Shalley (1991) described creative behavior as developing novel and appropriate alternatives to address job-related issues in a given situation. Consistently, creative behavior is also defined as behavior that facilitates the identification of original and improved ways to attain some objectives (Shalley, 1995). Three essential criteria to evaluate creative behavior that are: (a) originality and newness of the behavior; (b) the behavior is of value; (c) the behavior must be well-reflected in the mind of the creator. Thus, creative behavior refers to individual

performance that results in novel, useful and valuable products, services, or ideas.

As an attempt to provide a comprehensive picture of creative behavior, this study will utilize the self-determination theory (SDT) as the underpinning theory. Apart from SDT, organizational support theory (OST) will be employed to further refine the framework proposed for this study. In the next section, explanation on the theories will be presented and a brief review on evolution of the theory will be presented.

2.3 Underpinning Theories

This study will utilize Deci and Ryan's self-determination theory as the main theory to explain the framework. Organizational support theory will also be used to refine the framework and propose variables that are relevant in the context of this study and perhaps could offer an integrated and comprehensive explanation of creative behavior.

2.3.1 Self-determination Theory

Self-determination theory (SDT) is a meta-theory first introduced by Deci and Ryan (1985) to offer explanation on energy and direction of certain type of behavior that is autonomous in nature. This perspective supports the "organismic view" of a person whereby the person is seen as playing an active role in their own development and behavior. Accoding to SDT, autonomous behavior such as creative behavior or prosocial behavior is the result of high level of motivation experienced by an individual after the needs have been fulfilled. The three innate needs refer to

competence, autonomy and relatedness are "essential for on-going psychological growth, integrity and well-being" (Deci & Ryan, 2000, p. 229). The need for competence is concerned about a person's need to be effective in one's interaction with the environment. The need for autonomy refers to the need an individual has to experience choice and be in control of his or her action. The need for relatedness, on the other hand, accounts for an individual's need to feel accepted and respected by others. It is posited that once these psychological needs are fulfilled, work motivation is enhanced and consequently, individual positive outcome such as creative behavior, prosocial behavior or organizational citizenship behavior is manifested (Deci & Ryan, 1985; Ryan & Deci, 2000; Gagne & Deci, 2005).

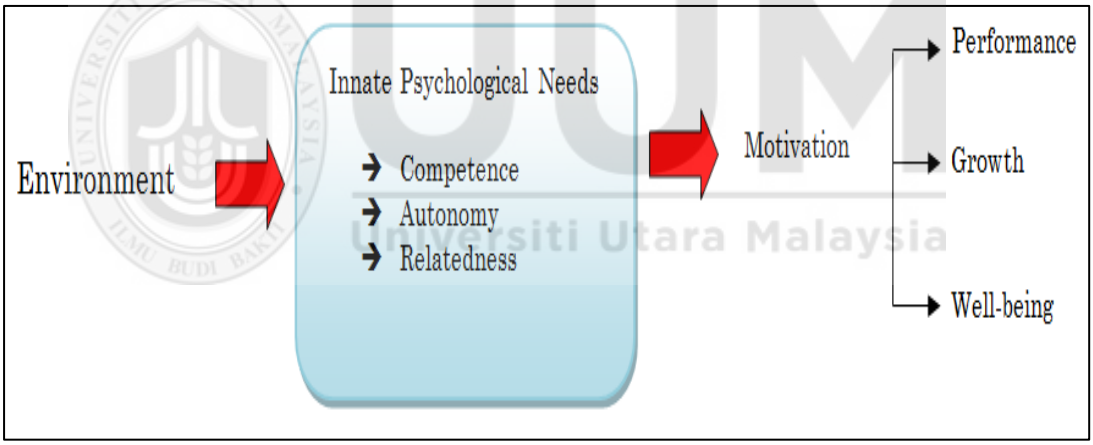

Figure 2.1:
Self-determination Theory introduced by Deci & Ryan (1985)

SDT sets a framework that emphasizes the importance of stimulants in the environment that are important to trigger motivation and in this study work motivation within a person. The active-organism perspective views both psychological needs and external environmental stimuli as affordances or opportunities the person can utilize in meeting the person's basic needs. Work motivation is triggered when these stimulants act as feeder to fulfil the specific

psychological needs of a person. An accepted paradigm of motivation throughout the fields of Psychology and Social Psychology is that motivation can be conceptualized as comprising of two conflicting elements, intrinsic vs. extrinsic. Intrinsic motivation deals with the excitement in engaging in any activity e.g. a job for the sake of enjoyment and satisfaction derived from performing the job itself. Contradictory, extrinsic motivation refers to performing certain tasks not because of the inherent interest gained by performing that tasks rather due to the expectation to gain an external reward for performing the task. Another important aspect of this conventional paradigm is the aspect of reward contigencies. This notion is well supported by early research on motivation. The reward contigencies perspective proposes that extrinsic motivation has a detrimental effect on intrinsic motivation. In the introduction of reward, individual who initially perform the tasks purely for the inherent interest, enjoyment and satisfaction in performing the taks will cease to do so because he or she now will perform the task in expectation of obtaining the reward (Amabile, 1998; Deci & Ryan, 1985; Ryan, Mims & Koestner, 1983).

The undermining effect of extrinsic contingent reward on intrinsic inherent interest could be explained using the locus of causality reasoning. Deci and Ryan (1985) and Ryan, Mims and Koestner (1983) suggested that there is a change in the locus of causality from internal to external when the decrement effect occurs to intrinsic motivation after the introduction of rewards for interesting tasks and activities. The internal locus of causality will lead to autonomous behavior that is self determined whereas the external locus of causality will lead to controlled non-autonomous behavior. This is the the core of the traditional perceived locus of causality approach that contrasts internal and external loci.

SDT, moreover provides a distinct yet enriching perspective of locus of causality by elaborating and sharpening the discussion on locus of causality. The new perspective as supported by SDT sees the enriched locus of causality through the modeling of a "gradient of autonomy" on the basis of individual perception on the reasons for acting (Ryan & Connell, 1989). The "gradient of autonomy" is conceptualized as existing along a continuum of internal and external locus of causality. Hence, the traditional conception of internal versus external loci were challenged.

SDT has gone through several revisions over the years, (Deci & Ryan, 1980; 1985; 2000; Deci, Connell & Ryan, 1989; Ryan & Deci 2000; Vallerand, 2000). Over the years and after several studies conducted to empirically support SDT, Deci and Ryan (2000) suggested that motivation should be conceptualize differently. Deriving from the understanding of the "gradient of autonomy", from a dichotomous definition of intrinsic and extrinsic motivation, now, motivation is viewed from a multidimensional perspective and these constructs are located on a continuum. The constructs are intrinsic motivation, four types of extrinsic motivation that are integrated, identified, introjected and external regulated and amotivation (refers to a state of relatively absent of motivation). Figure 2.2 shows the spectrum of motivation as identified. Consistently, Amabile (1996) argued that intrinsic motivation is found to be conducive to creative behavior as well as the extrinsic motivation that has enabling and informative effects. However, only the controlling effect of extrinsic motivation (Amabile, 1996) is found to be detrimental to any self-determined behavior including creative behavior.

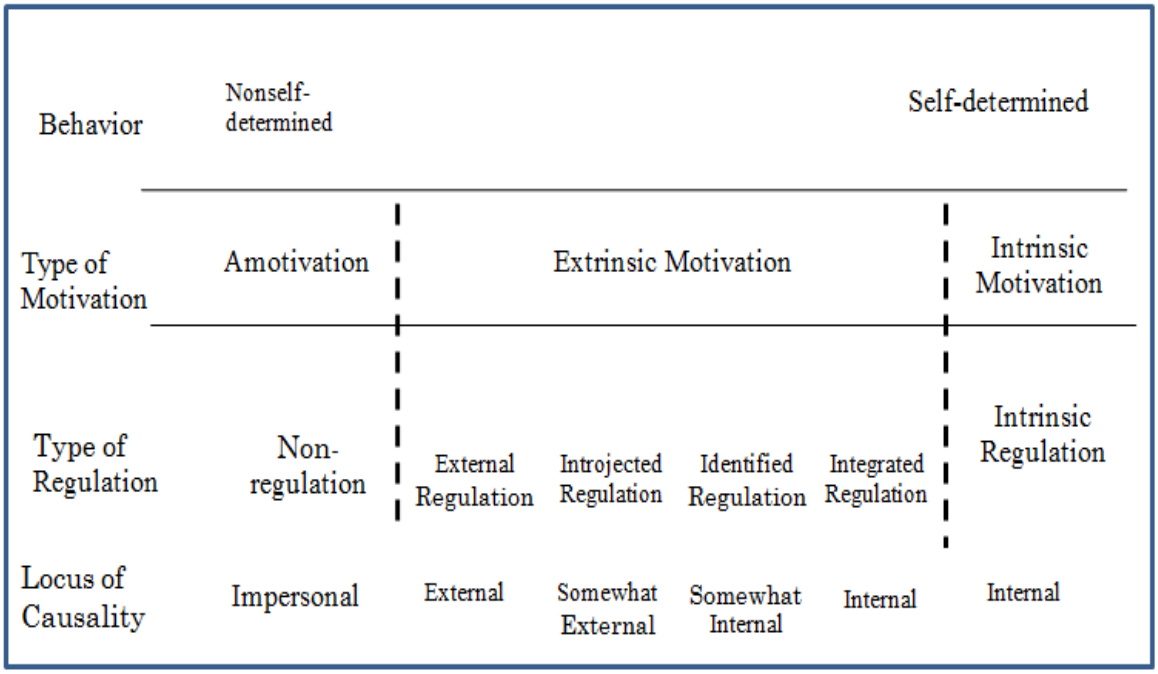

Figure 2.2:
The self-determination continuum, showing the motivational, self-regulatory, and perceived locus of causality based of behaviors that vary in the degree to which they are self-determined.

From a self-determination perspective, a person will engage in autonomous behavior not only when the state of motivation is purely intrinsic. As suggested by Amabile (1994), Deci and Ryan (2000), Gagné and Deci (2005) and Vallerand (2000), autonomous behavior such as creative behavior is driven by both intrinsic and certain types of extrinsic motivation. The enabling and informational types of extrinsic motivation can have positive effects on one's self-determination thus relate positively with intrinsic motivation. To capture the synergistic effects of intrinsic and extrinsic motivation on individual outcomes, and in this case, creative behavior, as suggested by Amabile et *al.* (1994), the concept of work motivation will be utilized. The instrument used to measure work motivation is the work preference index (WPI).

2.3.2 Organizational Support Theory (OST)

The concepts of social exchange (Blau, 1964) and the norm of reciprocity (Gouldner, 1960) have long been used by organizational researchers to describe the motivational basis behind employee behaviors and the formation of positive employee attitudes (e.g. Levinson, 1965). More recently, these concepts have been used to explain why individuals express loyalty to the organization (e.g., Eisenberger, Huntington, Hutchinson & Sowa, 1986) and engage in behaviors that typically are neither formally rewarded nor contractually enforceable (e.g., Organ, 1988; Rousseau, 1989).

Researchers have been increasingly interested in the role of exchange processes in organizations (Rousseau, 1989). As described by Blau (1964), social exchanges entail unspecified obligations; when one person does another a favor, there is an expectation of some future return, though exactly when it will occur and in what form is often unclear (Gouldner, 1960). Employees tend to take a long-term approach to social exchange relationships at work, with the pattern of reciprocity over time determining the perceived balance in exchanges (Blau, 1964; Rousseau, 1989). There are two types of social exchanges have been studied in recent years. Exchanges between an employee and employing organization are called perceived organizational support (Eisenberger, et al., 1986).

According to organizational support theory (OST) employees constantly assess their relationships with their employers. OST posits that employees form a general perception relating the extent to which the organization they work for value their contributions and concern about their well-being (Eisenberger, 1989; Rhoades &

Eisenberger, 2002). Employees develop the global beliefs relating to the extent to which the organization values their contributions and cares about them and their well-being. As a result, people will compare their effort and contributions towards the company with the benefits, rewards and treatments they gain from the company.

Employees feel obligated to "pay back" the rewards and favorable conditions provided to them by the organization by performing their job effectively (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001). From the psychological perspective, this is known as the reciprocation process. As indicated by OST, the organization serves as the source of socio-emotional resources that facilitate the fulfilment of tangible and intangible aspects of human needs. Through wages and other tangible benefits, employees will be able to sustain their lives and the recognition, acceptance and respect they gain through their interaction at the work place will help them fulfil their needs for esteem and affiliation (Eisenberger et al., 1986). Hence, when the employees perceived that organization is committed to provide them with the resources vital for the fulfilment of their needs, they will reciprocate by increasing the level of commitment towards the organization. Consequently, OST suggested that there will be an increase in in-role and extra role performances while stress and withdrawal behaviors will be decreased (Eisenberger et al., 1989).

OST invokes social exchange theory wherein employment is viewed as the trade of effort and loyalty by the employee for tangible benefits and social resources from the organization (Cropanzano & Mitchell, 2005; Kurtessis, Eisenberger, Ford, Buffardi, Stewart & Adis, 2015). High levels of POS create feelings of obligation, whereby employees not only feel that they ought to be committed to their employers, but also

feel an obligation to return the employers' commitment by engaging in behaviors that support organizational goals. That is, employees seek a balance in their exchange relationships with organizations by having attitudes and behaviors commensurate with the degree of employer commitment to them as individuals. In general, research findings suggest that positive, beneficial actions directed at employees by the organization and/or its representatives contribute to the establishment of high-quality exchange relationships (e.g., Dansereau, Graen, & Haga, 1975; Konovsky & Pugh, 1994) that create obligations for employees to reciprocate in positive, beneficial ways (e.g., Eisenberger et al., 1986; Shore & Wayne, 1993).

POS should elicit the norm of reciprocity, leading to a felt obligation to help the organization, as well as the expectation that increased performance on behalf of the organization will be noticed and rewarded. As a result, employees with high POS should engage in greater job-related efforts, resulting in enhanced in-role job performance and extra-role performance helpful to the organization. With regard to affective organizational commitment, employees seek balance in their relationship with the organization by developing favorable attitudes and behaviors consistent with POS. Thus, felt obligation resulting from POS has been found to be positively related to positive organizational behaviors and commitment (Eisenberger, et al., 2001; Kurtessis, et al., 2015).

A meta-analysis study on OST by Rhoades and Eisenberger (2002) reveal that there are three general categories of antecedents that significantly influence perceived organizational support of employees. Fairness that relates to distributive and procedural justice, supervisor support, and organizational rewards and job conditions

are the three major categories identified in this study. The issue of fairness is regarded as a significant factor that influences the employees' perception on organizational support. Fairness in this aspect includes the perceived fairness of the structure, rules, regulation, allocation of resources and accurate information and voice in decision. Fairness in politicking and persuasive attempts is also considered as factors that might influence perceived organizational support of employees. In terms of supervisor support, the extent to how the supervisor values the employees' contribution and genuinely cares about their well-being is cited as important issue in explaining employees' valuation of the organizational support. As for rewards and job conditions, factors identified as important to positively affect employees' perception of their organization are recognition, pay and promotions, few aspects of the job such as autonomy and job security and role stressors. Other organization conditions that might have positive influence on an employee's valuation are training provided to employees and type and size of the organization.

As argued by social exchange theorists, people tend to put more value on resources received from others if they see these as voluntarily provided to them. People will see this as genuine act and simultaneously, as the expression of value and respect towards the recipients (Rhoades & Eisenberger, 2002). Employees interpret their perceived organization support as assurance that aid will readily available when needed particularly to effectively conduct the task or when dealing with stressful condition (Rhoades & Eisenberger, 2002). As a conclusion, OST put forth the idea of reciprocation that is good deeds and favors will in return yield commitment and high performance.

2.4 Creative Behavior: Person-Environment Perspective

Consistent with the self-determination theory, the interaction perspective on creative behavior is an avenue that can be used to explain creative behavior at work. This approach championed by Woodman, Sawyer and Griffin (1993) has shifted the conventional psychological perspective of creativity. It is irrefutable that individual components which are talent and motivation are important aspects that are required by creativity, but the context in which an individual performs his or her creative work that evokes and nurture creativity is also of equal significance in ensuring a successful execution of any creative effort (Ford & Gioia, 1995). Thus, creativity is not the sole domain of a person; rather there are more into creativity that require more examination and explanation. It has been argued that among many factors, the structure of the organization, resources available for organizational activities, encouragement from organization, effective supervision and support from peers are among the factors that should be examined when exploring creativity. The interactionist approach is adopted by the majority of current researchers on creativity particularly in the area of social psychology. Among the researchers who contribute to empirically support this perspective are Amabile et al., (1985), Cummings, Hinton and Gobdel (1975), Dollinger (2003), George and Zhou (2001), McCrae (1987), Oldham and Cummings (1996), Phelan and Young (2003), Ruscio, Whitney and Amabile (1998), Scott & Bruce (1994), Tierney and Farmer (2002), Tierney and Farmer (2002), Tierney, Farmer and Graen (1999), Williams (2004). The sections below will provide discussions on predictors of creative behavior.

2.5 Predictors of Creative Behavior

Creative behavior is a self-directed behavior that is regarded as a form of task performance. Previous works on creative behavior have identified numerous factors that could potentially affect creative behavior. Those could be the various factors in the environment; variables that are job related and variables that are included in a macro general organizational context. These variables could either have direct or indirect influence and either positively or negatively affect creative behavior of employees.

A large body of literature has focused on personal characteristics and attributes as the determinants of creative behavior demonstrated by employees in the workplace. Factors such as motivation (Amabile et al., 1985; McCrae, 1987; Ruscio, Whitney & Amabile, 1998), personality (George & Zhou, 2001; Dollinger, 2003; Phelan & Young, 2003) and self-efficacy (Tierney & Farmer, 2002) are among the predictors used to determine creative behavior of individual employees. Although the search for personal characteristics predictive dominated studies in the area of creativity, recent trend shows that researchers have begun to refocus their interests in finding the other determinants of creative behavior.

Researchers such as Amabile et al. (2004), Egan (2005), Scott and Bruce (1994), Shalley, Gilson and Blum (2000), Terborg (1981), Williams (2004), Woodman, Sawyer and Griffith (1993) and Zhou and George (2003) had examined other factors rather than personal variables as determinants of creative behavior. These factors are known as contextual factors (Amabile, 1996; Cummings & Oldham, 1997; Egan,

2005). Contextual factors refer to the context in which an individual performs his or her task that will have the effects on his or her creative behavior (Oldham & Cummings, 1996' Egan, 2005). Among the contextual factors being studied in previous studies are supervisory or leader support (Amabile et al., 2004; Scott & Bruce, 1994; Tierney & Farmer 2002; Tierney, Farmer & Graen, 1999; Williams 2004), aspects of the job such as job complexity (Cummings & Oldham, 1997; Kanter, 1988; Tierney & Farmer, 2002) and autonomy (Amabile et al. (1996), coworkers or peer support (Cummings & Oldham, 1997; Zhou & George, 2001), organizational culture (Ashkanasy et *al.*, 2000; Navaresse, 2008; Quinn, 1988; Spreitzer, 1992), rewards (Amabile, 1985; Chen & Kaufman, 2008; Eisenberger & Rhoades, 2001; McKenzie & Lee, 1998) and other organizational factors such as organizational impediment to (Amabile et *al.*, 1996; Beehr, et al.) and support for creativity (Cummings, Hinton & Gobdel, 1975; 2000Lepine, Podsakoff & Lepine, 2005; Zhou & George, 2001).

2.5.1 Individual Level

The primary focus of creativity literature has been to identify personal attributes that facilitate or impede creative behavior. Individual factors that have been studied are motivation, cognitive styles, creative abilities and characteristics. Further examination of past studies have shown that apart from the study of creative personality, personality type and level of personality, specific personal characteristics or traits such as self-esteem, autonomy, mood state, self-job efficacy, cognitive style, problem solving style and divergent thinking have been widely studied in order to understand the subject of creative behavior and creativity in general. A general

discussion on some of the important personal variables will be discussed in section below. Nonetheless, the studies on the influence of intrinsic and extrinsic motivation have gained much attention from researchers (e.g. Amabile, 1985; Chen & Kaufman, 2008; Deci & Ryan, 1985; Eisenberger & Rhoades, 2001; McKenzie & Lee, 1998; Ryan & Deci, 2000). Hence, a review of past literature on motivation and creative behavior will be presented in section 2.5.1.2.

2.5.1.1 Personal Variables and Creative Behavior

First, the personal variable that is mostly related to creative behaviour is personality. Personality has been identified as one of the key variables associated with individual creative behavior (Cummings & Oldham, 1997; George & Zhou, 2001; Costa & McCrae, 1995; Feists, 1998; Egan, 2005). Studies of creative people in a variety of settings such as artists, R and D employees that include scientists and engineers, managers as well as students lead to the conclusion that creative individuals have few common characteristics (Martindale, 1989; Cummings & Oldham, 1997). Essentially, highly creative people are self-confident, intuitive, and tolerant of complexity and ambiguity (Cummings & Oldham, 1997). Creative people are also described as sensitive, open, less conventional, less conscientious, self-accepting, driven, ambitious, dominant and flexible in thoughts (Feist, 1998). Burgeoning literature on creativity has supported the significant influence of various aspects of personality on creativity. Personality dimensions that are reliably associated with creative behavior at work are conscientiousness and openness to experience (George & Zhou, 2001; Costa & McCrae, 1995; Feists, 1998). Divergent thinking is another aspect of personality that is also positively related to creativity in several other studies (Carson

et al., 2003; Peterson & Carson, 2000). McCrae (1989), Cummings and Oldham (1997) and Zhou (2003) also found that the creative personality of employees can have an important effect on creative behavior.

Self-perception is another variable that is also mostly studied in the literature of creativity. The effects of various elements of self-perception on creativity are gaining popularity among researchers in creative behavior. Self-perception refers to an individual's perception of his ability to be creative and his perception of his creative work-related outcomes (Egan, 2005). Farmer, Tierney and Kung-McIntyre (2003) explored the important influence of an element of self-perception known as creative role identity on creative behavior. Creative self-efficacy is another dimension of self-perception posited to have impacts on creative behavior (Cummings & Oldham, 1997; Tierney & Farmer, 2002). Other dimensions of self-perception examined as to have an influence on creative behavior are perceived self-determination (Eisenberger & Rhoades, 2001), individual regulatory focus (Friedman & Foster, 2001) and creative self-efficacy (Farmer, Tierney & Kung-McIntyre, 2003). Previous research has consistently shown positive results of these dimensions of self-perception and creative behavior. Consistent with these findings, a study by Mumford et al. (2002) confirmed the role of beliefs in facilitating creative problem solving activities.

Cognitive style is another variable that is widely studied in creativity. Researchers have attempted to explore many types of cognitive styles and examine how they relate to creative behavior. Studies on creative style preference (Buttner et al., 1999; Jaskyte & Kisieliene, 2006; Madjar et al., 2002; Phelan & Young, 2003; Puccio, Talbot & Joniak, 2000; Tierney, Farmer & Graen, 1999), problem solving style (Kim,

2000; Oldham & Cummings, 1997; Scott & Bruce, 1994; Wang & Horng, 2000) and divergent thinking (McCrae, 1987; Williams, 2004) have found significant relationships between these cognitive styles with creative behavior at work.

2.5.2 Contextual Factors

Organizations worldwide place a very high value on creativity. Hence, it is important to tap and encourage employees' creative potential, and to provide the context that will install creative behavior at the workplace. An attempt to propose a comprehensive model that explains the influence of various facilitating or disabling factors, both personal and contextual and at different levels of analysis is regarded essential in order to grasp creative behavior at work.

Contextual factors refer to the variables in the context in which an individual performs his or her task that will have some effects on his or her creative behavior (Oldham & Cummings, 1996). The context composed of numerous variables that if they interact with the individual creative talent and potential will lead to the demonstration of creative behavior and the production of creative outcomes at work (Amabile, 1996; Amabile et al., 2004; Brown & Leigh, 2005; Kim, 2000; Mumford, 2000). These contextual factors could be analyzed at two different levels of analysis which are organizational level and work level. Organizational level factors refer to contextual factors that are pertinent to the organizational structure, design and process. The work level factors, on the other hand, are variables that make up the composition of a job (e.g. autonomy, feedback, skills variety, identity and significance) and the immediate environment where the job is performed (e.g. the quality of supervision, composition and the quality of teams). These organizational

and work factors are hypothesized to influence the individual motivational level and later, encourage the employees to engage in creative behavior.

Among the contextual variables that have been analyzed in previous studies are supervisory styles and leader support (Amabile et *al.*, 2004; Scott & Bruce, 1994; Tierney & Farmer 2002; Tierney, Farmer & Graen, 1999; Williams 2004), characteristics of the job such as job complexity (Cummings & Oldham, 1997; Tierney & Farmer, 2002), autonomy (Amabile et al., 1996; Oldham & Cummings; Shalley & Gilson, 2002;) and feedback (Farr, 1995; Oldham & Cummings, 1998; Staafford, 1998; Wong & Pang, 2003; Van Dijk & Kluger, 2004) and co-workers or peer support (Cummings & Oldham, 1997; Zhou & George, 2001). Other aspects of a person's job such as various forms of work pressures including workload (Amabile et al., 1988), work strain (Van Dyne et al., 2002) and work demand (Puccio etal., 2000) were also examined in many studies on creative behavior.

Apart from work factors, previous studies have also given considerable emphasis on organizational factors such as organizational climate (Amabile, 1988; Amabile et al., 1996; Ekvall & Ryhammer, 1998; Puccio et al., 2000; Kim, 2000), organizational support (Amabile et *al.*, 1996; Madjar et *al.*, 2002), reward system (Eiesenberger & Rhoades, 2001; Giese & Weisenberger, 1982; Kahai et al., 2003; Tucker & Abassi, 2015), organizational impediments to creativity (Amabile et al., 1996), information sharing and networking (Sundgren et al., 2005) and organizational support for creativity (Cummings, Hinton & Gobdel, 1975; Zhou & George, 2001).

The next section will cover the discussions on the contextual factors that are selected as the independent variables for the study. The independent variables are supervisory styles, job characteristics dimension of autonomy, an element of organizational culture known as IOVC, stressors and reward. Review of past literatures and the discussions on the relationships of the variables with creative behavior will be presented in this part of the chapter.

2.5.2.1 Stressors

Another variable considered important by OST in determining employee's performance specifically creative behavior are stressors or the sources of stress. Work stressors referred to as factors in the environment particularly at the workplace that are potentially damaging to a person's wellbeing (Beehr, 1995; Beehr, Jex, Stacy & Murray, 2000). Stressors have received attention from both the practitioner and academic due to the linkage of these factors with the organizational end result and individual outcomes particularly performance (Moss, 1997). There is a fast growing body of research that has been undertaken in estimating the effect of stressors and strains on employees at the workplace. Because of this, Moss (1997) has suggested that stressors as important socio-cultural phenomenon that have become part of an organizational context.

Commonly, stressors are grouped as chronic and acute stressors. Chronic type of stressor is considered constant for an employee as long as he/she is in the occupation (Beehr et al., 2000). An example of chronic stressor is role ambiguity. Acute stressors, on the other hand, reflect something that is short term in nature and episodic (Beehr et al., 2000). Motowidlow, Packard and Manning (1986) suggested that

chronic stressors to be conceptualized generically or the same for all jobs whereas acute stressors to be conceptualized as more job-specific. Acute stressors however, are considered harmful and could have longer lasting effect on the person compared to chronic stressor (LePine, Podsakoff & LePine, 2005).

Stress is a relationship between the individual and the situation. The psychological perspective of human being could be utilized to help explain the relationship between stressors and creative behavior. It is considered inherent human ability to constantly monitor and consistently engage in cognitive evaluation of the situation in order to understand his or her reactions both emotionally and psychologically towards the situation (Lazarus, 1991; Perrewe et al., 2004). It is argued that if the demand created by the environment or situation deemed as threatening or exceeding the person's resources, stress will be produced (Perrewe et al., 2004). Stress therefore, is a form of reaction that will be triggered if the individual being exposed to threats or stressors. From a stimulus perspective, work stressors are potentially harmful to the person's psychological wellbeing (Beehr, et al., 2000) thus, could have negative effect on human motivation and performance. However, LePine, Podsakoff and LePine (2005) argued that stressors might also have positive effect on individuals in a way that these stressors can positively influence motivation and facilitate work performance.

The variable stressors have received considerable attention in the study of performance. Example of stressors that have been examined by researchers (e.g. Beehr, et al., 2000; Byron, Nazarian & Kazanchi, 2010)are conflicting demand, role overload, competition, time constraint, ambiguity in performing one's tasks and workplace hazards. However, theoretically, knowledge regarding the effect of

stressors on performance and in this context, creative behavior will is still deficient. In terms of the relationship between stressors and creativity, previous studies have found mixed and inconsistent results. Studies such as by Baer (1998) found positive relationship between stressors and creativity, Amabile et al. (1990) found that stressors and creativity is negatively related while Lepine, Podsakoff and Lepine (2005) found curvilinear relationships between stressors and creativity. Thus, the relationships between stressors and creativity still remain unclear and need further exploration. Lepine, Podsakoff and Lepine (2005) proposed that further examination of the effect of stressors on work performance including creative behavior should be carried out in order to clarify the relationships between the two variables.

Accounting for the inconsistency is crucial in establishing the relationship between stress and performance at work particularly creative behavior. Consistent with most studies in creativity, in this study, the stimulus-based definition of stress will be utilized. Studies employing stimulus approach are concerned with stressors both physical and psychological. This approach will seek for how environment triggers condition that necessitate an individual adaptive response i.e. in terms of disabling or facilitating motivation and hence affect creative behavior (LePine,Podsakoff & LePine, 2005; Byron, Kazanchi & Nazarian, 2010).

Distraction arousal theory postulated that stressor could decrease or has disabling effect on creative behavior. The theory suggested that human has limited pool of cognitive resources and when they utilized some of these resources to attend to stressors, this will leave fewer cognitive resources available to attend to more important tasks such as performing the job and engage in creative behavior. Thus,

people will resort to engage in simpler cognitive strategies that undermine creativity (Byron, Kazanchi & Nazarian, 2010). This explains the negative effect of stressors known as hindrance stressors to creative behavior. Another type of stressors is considered as challenge stressors. Challenge stressors, on the other hand, are suggested to enhance work motivation and positively affect creative behavior. Challenge stressors increase arousal, elicit the use of creative thoughts and motivate engagement in creative strategies in order to perform one's task (Byron, Kazanchi & Nazarian, 2010). Hence, challenge stressors are facilitating factors that could increase employee's motivation and engage in creative activities.

2.5.2.2 Job Characteristics

The design of job has long been considered an important influence on individuals' intrinsic motivation and later lead to creative behavior of employees at work (Amabile, 1985, 1988; Kanter, 1988; George & Zhou, 2001; Oldham & Cummings, 1996; Tierney & Farmer, 2002; McCrae, 1987; Ruscio, Whitney & Amabile, 1998; West & Farr, 1989). Autonomy, feedback, skill variety, task significance and task identity have been proposed as dimensions of job factors that affect creative behavior (Oldham & Cummings, 1996; Tierney & Farmer, 2002). The Job Characteristics Model, developed by Oldham and Hackman (1980), purports that individual performance can be enhanced when he/she perceives that his/her job entails the five main characteristics stated above.

Job characteristics model assert that a job will have influence on an employee's performance when the person performing the job experiences the three psychological

states. The three principal psychological states are a) experienced meaningfulness, b) experienced responsibility and c) experienced knowledge of his or her performance. Consistent with the assertions of job characteristics model, researchers in the field of creativity have identified the design of jobs as an important component that needs to be addressed when cultivating creativity (Amabile, 1988; Oldham & Cummings, 1996).

Jobs that are designed with high complexity characterized by high levels of autonomy, skill variety, identity, significance and feedback can have a positive impact on employees' creativity (Oldham & Cummings, 1996). When jobs are complex, individuals performing the job are likely to be excited and more interested to engage in and complete the work activities. As a result, employees are more likely to concentrate all of their attention and effort on their job making them more open and willing to try out new ideas and consider different alternatives. This will later lead to more creative outcomes (Oldham & Cummings, 1996; Shalley & Gilson, 2004).

A study done by Oldham and Cummings (1996) found that creative employees produce more novel and useful suggestions when they are involved in more complex jobs. Similarly, Tierney and Farmer (2002) also established positive association between job complexity and creative self-efficacy, which later transforms into creative behavior. These findings are also consistent with finding from studies by Shalley, Gilson and Blum (2000) suggested that autonomy, complexity and high demand were positively associated with high level of creativity among employees.

Behavioral scientists attempted to identify and explain various job dimensions that

would influence performance of people who perform the jobs. The theory that best exemplifies these attempts perhaps is the one put forth by Hackman and Oldham (1980). The job characteristics model suggests that there are five core job dimensions. Core job dimensions refer to the underlying characteristics of a job and how these factors affect job outcomes such as performance, involvement, motivation and satisfaction (Cook & Hunsaker, 2001). Amongst the five main job dimensions, autonomy (Amabile, 1996; Shalley & Gilson, 2004) and feedback (Farr, 1995; Stafford, 1998) have been singled out as important predictors of creativity. Autonomy is the core dimension of job characteristics that receive considerable attention from researchers (such as Amabile et al., 1996; Oldham & Cummings 1996) and suggested by OST to significantly affect work motivation and creative behavior. Hackman and Oldham described autonomy in a job as:

> *the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out* (1980, 79).

With autonomy, an individual will have the freedom to approach the job in any way he or she pleases. The job characteristic of autonomy elicits increased experienced of personal responsibility of a jobholder for the work outcomes (Hackman & Oldham, 1980). This means that if the jobholder is given the freedom and flexibility in performing his or her job, the job incumbent will experience a sense of accountability for the work outcomes (Kreitner & Kinicki, 1998). According to Hackman and Oldham (1980), feelings of responsibility for the work outcomes will have positive impact on employees' work motivation and later facilitate creative behavior.

Feedback is another core job dimension that is considered to be an important element

of a job due to its influence on the jobholder's critical psychological states. Feedback provides pertinent information about a job incumbent's performance of the job (Kreitner & Kinicki, 1998), and offers indication as to what needs to be changed and improved. In other words, feedback of the job is the degree to which carrying out the work activities required by the job provides the job incumbent with direct and apparent information about how effectively the job incumbent performs his or her work (Hackman & Oldham, 1980; Kreitner & Kinicki, 1998). Job feedback provides knowledge of the results of the job incumbent's work that is, whether the job incumbent has performed his or her work well or the contrary (Hackman & Oldham, 1980). Thus, as proposed by Hackman and Oldham (1980), the knowledge of results is one of the three conditions that must be present in order for intrinsic work motivation that is the prerequisite towards creative behavior to occur on the job.

Another pursuit to understand the effect of the job on the creative behavior is to look at the characteristics collectively. Oldham and Cummings (1996) tried to look at the effect of job complexity on creative performance. Job complexity is characterized by high levels of autonomy, skill variety, identity, significance and feedback. In these studies, it is found that challenging jobs is one of the contextual characteristics that lead to the production of creative work (Oldham & Cummings, 1996; Tierney & Farmer, 2002).

In this study however, only the dimension of autonomy in job characteristics will be employed as the independent variable. Autonomy has been identified by OST as one of the potent predictors of creative behavior Rhoades & Eisenberger, (2002). As explained by SDT, once employees experience increased responsibility, the

motivational level is heightened (Deci & Ryan, 2002). It is postulated that highly motivated employees will engage with creative efforts at work (Amabile, 1996; Oldham & Cummings, 1996; Shalley & Gilson, 2004).

2.5.2.3 Rewards

Another contextual factor that has been expansively studied in relations with creative behavior is reward. Reward is regarded as an instrument used by management as a motivational mechanism to align personal achievement with attainment of organizational goals (McKenzie & Lee, 1998). Rewards can be categorized as tangible or intangible rewards and also monetary or non-monetary. Another categorizations of rewards that have been widely used in the area of psychology are intrinsic and extrinsic rewards. Intrinsic rewards are internally oriented to the individual and derive from performing the tasks itself (Byars & Rue, 2003). An example is a feeling of achievement after successfully completing a challenging task. Extrinsic rewards are of tangible in nature and administered by other sources such as the management or the organization (Byars & Rue, 2003). Examples of extrinsic rewards are pay and benefits.

Reward is considered to be the most controversial variable considered to have influence on creative behavior (Amabile, 1985; Egan, 2005). There are many studies for example Amabile (1985), Eisenberger and Armeli (1997; 1998) and Eisenberger and Rhoades (2001) that have attempted to examine the effect of rewards on creative behavior. However, these studies have yielded inconsistent results.

Intrinsic reward nurtures intrinsic motivation and intrinsic motivation is stipulated to be positively related to creative behavior (Amabile, 1985; 1996). Extrinsic reward on the other hand, cultivates extrinsic motivation and it is proposed that extrinsic reward is detrimental to intrinsic motivation (Amabile, 1985, 1988, 1996; Deci & Ryan, 1985). Consistent with prior works (e.g. Amabile, 1985; 1988; 1996; Deci & Ryan, 1985; Eisenberger & Armeli, 1997, 1998; Eisenberger & Rhoades, 2001) on reward-motivation links, extrinsic reward is assumed to have an undermining effect on intrinsically driven activity. With the introduction of tangible reward such as the administration of any sum of money to intrinsically motivated behavior such as creative behavior, the intrinsic motivation will be undermined. If the reward is not constantly given to the person who engages in creative effort, it is assumed that creative behavior will diminish. The person will now performs the task not due to the enjoyment and satisfaction derived from the task itself rather, due to the rewards given when performing the task. Hence, this describes the undermining effect of extrinsic reward on intrinsic motivation.

Contrary to the abovementioned notion, a few researchers such as Eisenberger & Rhoades (2001), Eisenberger and Armeli (1997; 1998), and Chen and Kaufman (2008) supported a contradictory perspective on the reward-motivation-creative behavior link. Findings from these studies have established positive relationships between promised or actual rewards on motivation and creative behavior. Rewards given repeatedly to subjects for creative performance increased subjects' creativity in subsequent tasks (Eisenberger & Rhoades, 2001) and encouraged participants to produced novel responses (Eisenberger & Armeli, 1997). It is ascertained that motivation that is extrinsically founded does not necessarily have a negative effect on

creative behavior (Chen & Kaufman, 2008; Eisenberger & Rhoades, 2001).

Consistently, Amabile (1996) has come up with a new Intrinsic Motivation Principles of Motivation that describes the effects of extrinsic motivation on intrinsic motivation. According to the new principle, certain type of extrinsic motivation facilitates the effectiveness of intrinsic motivation. Extrinsic motivation that is considered as informational or enabling is perceived to have positive effects on employees' creativity (Amabile, 1996; Deci & Ryan, 2002). This is because the reward is given to indicate achievement in performing or completing certain tasks. The reward given acts as the source of positive feedback and acknowledgement of expected behavior and thus, encourages the same behavior in the future. This type of extrinsic motivation is believed to be conducive towards enhancing individuals' creative behavior, particularly when the initial levels of intrinsic motivation are high (Amabile, 1996). Thus, this explains the facilitating effect of reward on motivation and later positively affects creative behavior at work.

This study attempts to look at reward because it is considered as an important predictor among Malaysian employees who are currently engaged in R & D effort. A preliminary study conducted earlier found that one of the issues that have been plaguing the people working in R & D in Malaysia is that they perceived that they are being undervalued and under-rewarded. This could be further supported by the issue of brain drain in Malaysian corporations. This study hypothesizes that rewards will have positive effect on creative behavior. Researchers such as Amabile (1985; 1994) found a negative relationship between rewards and creative behavior. Postulated as having undermining effects, any types of extrinsic reward are considered detrimental

on creative behavior. On the other hand, Eisenberger and Armeli (1997; 1998) and Eisenberger and Rhoades (2001) found that there is a positive relationship between reward and creative behavior. This is consistent with Deci and Ryan's (1980) suggestion and Amabile's new motivation principle. It is suggested that the kind of extrinsic reward that are informative or providing useful information on employee's performance could enhance creative behavior of employees.

2.5.2.4 Organizational Culture

Culture can be described as the general patterns of basic components that are invented, discovered or developed by a group of people that serve as mechanisms to cope with problem or to adapt to external environment and internal integration (Schein, 1985). It is suggested that both national and organizational cultures, toward a certain extent impart values that influence how people within the organization interact and respond to the organizational environment. Organizational systems are infused by values and beliefs that produce cognitions and norms of behavior (Smircich, 1983). These values and beliefs are referred to as organizational culture. Scholars (e. g. Hofstede et al., 1990; Amabile at al., 1996) have introduced few similar concepts such as organizational climate and corporate culture, the introduction of organizational culture (OC) in the academic literature is attributed to Pettigrew (1979).

Organizational culture is a complex, multidimensional construct. A framework introduced by Holmquist and Botter (2004) describes culture as a system of meanings carried by individuals. These meanings are used by the individuals to interpret the

situation they are in whether it is based on function, social or spatial (Holmquist & Botter, 2004). Hofstede et al. (1990) suggested that the manifestation of culture is classified into four categories: symbols, heroes, rituals and values. The symbols, heroes and rituals can be subsumed under a more general category labelled as "practices". Furthermore, Quinn (1988) provides an alternative way of conceptualizing organizational culture by examining the values using these classifications: human resource (HR) values, innovation values, rational goal values and hierarchical values. Given the multiple facets of organizational culture, Hofstede et al. (1990) state that have several scales that have been developed to measure organizational culture traits and this can be grouped into: (1) process versus results-oriented; (2) employee versus job-oriented; (3) parochial versus professional;(4) loose versus tight control and, (5) innovativeness versus risk-avoidance.

Organizational culture influences and differentiates organizations through the management practices developed in these organizations. Peters and Waterman (1982) found that management practices are deemed essential for the functioning of the organizations as well as influencing members' behavior in every aspect of the business. Therefore, it can be argued that through the organizational value system, individuals make sense of the organizational life and form their expectations and roles in the organization.

Peters and Waterman's *Search of Excellence* (1982) and Deal and Kennedy's *Corporate Culture* (1982) are regarded as a few earliest attempts to associate organizational culture with performance. The authors assert that corporate cultures particularly strong ones are the source of organizations' superior performance. This is

attributed generally to the shared values that act as an informal system that help employees shape up their perceptions and expectations. In addition, Potkuchi et al. (2002), Smircich (1983), and Holmquist and Botter (2004) suggested that organizational culture plays a significant role in determining organizational performance. The unique, intangible, sticky and constant characteristics of corporate culture promote radical innovation and help organizations to overcome factors in the environment that would otherwise hinder creativity and innovation (Tellis, Prabhu & Chandy, 2009).

As stated before, organizational culture is a rather broad concept and part of its interpretation sometimes explains the symbolic side of the conception. Researchers and practitioners have persistently attempted to identify significant attributes that characterize supportive environments for performance. Among many organizational culture dimensions that have been investigated by researchers, innovation orientation has been mostly studied in the study of performance (Amabile, 1996; 1983; Ashkanasy et al., 2000; Chan, 2003; Quinn, 1988; Spreitzer, 1992). IOVC has been found to positively contribute to performance, hence this study will only focus on this specific dimension of organizational culture that is the innovation-oriented value culture (IOVC) as the predictor of creative behavior.

Ashkanasy et al. (2000) described IOVC as the extent to which the organization shows encouragement towards creativity. IOVC is the degree to which the set of shared beliefs, values, heroes, stories and artefacts encourage individuals to behave in creative ways (Quinn, 1988; Spreitzer, 1992; Navaresse, 2008). Chan (2003) posits that IOVC is directly and positively related to the level of employee's perception on

his or her competency, self-determination, impact and meaning that describe motivation of an individual employee. This will later influence the high level of employee's performance. Consistently, Amabile et al. (1996) asserted that people behave more creatively when they are motivated by the interest, enjoyment, satisfaction and challenge that they gained by performing the work itself. Thus, IOVC is postulated to have a significant influence on the level of motivation and subsequently enhance creative behavior.

2.5.2.5 Supervisory Styles

Leadership is an important contextual factor that determines creative behavior of employees (Mumford's 2000; Allridge & Nilan, 2000). Leadership is usually assessed by examining the leaders' characteristics, skills, abilities and their effectiveness in influencing individuals outcomes such as performance specifically, creative behavior of employees (Allridge & Nilan, 2000). Scott and Bruce (1994) and Tierney, Farmer & Graen (1999) attempted to address the interaction process between the leader and the followers or known as leader-member exchange (LMX). LMX theory suggests that the quality of the relationship between supervisor and subordinates will determine the amount of decision making, influence and autonomy reassign to and exercise by subordinates (Graen & Scandura, 1987; Scott & Bruce, 1994; Tierney, Farmer & Graen, 1999). Jaussi and Dionne (2003) studied the effect of leader role modelling on creative behavior. And, more importantly, many researchers have examined the influence of various types of leader-employees relationships on employees' attitude that lead to employees' creative performance.

Analysis of previous studies have shown that the characteristics of the supervisors and

the quality of the relationships between leader and member has become the salient contextual factors often considered potent determinants of employees' creative behavior (Amabile & Gryskiewicz, 1989; Deci & Ryan, 1985; Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999; West & Farr, 1989). It is proposed that employees will react positively (demonstrate creative behavior) due to the influence exerted by the leaders on their employees through motivation, facilitation, evaluation, feedback, and reinforcement (Arad, Hanson & Schneider, 1997; Kim, 2000). In creativity studies, the effects of leaders' especially those closely related and responsible for the success of the employees' performance has long been the subject of interests of the researchers. Hence, researchers such as Amabile, et al. (1996), Deci and Ryan (1985) and Oldham and Cummings (1996) have identified supervisory styles as predictors of creative behavior among employees.

Deci and Ryan (1985) and Oldham and Cummings (1996) categorized supervisory styles into supportive and controlling or inhibiting styles. It is postulated that supervisors or leaders who demonstrate supportive style encourage the expression of creative behavior at work (Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999). Supportive style refers to style of supervision that shows concern for employees' feelings and needs, encourage them to express their concern, provide informational and constructive feedback, and facilitate employee development (Deci & Ryan, 1987; Oldham & Cummings, 1996). Supportive supervisor is another variable introduced by researchers (such as Amabile, et al., 2004; Cummings & Oldham, 1997; Madjar etal., 2002; Tierney and Farmer, 2002) to measure the same construct as supportive supervisory style. In the creative behavior literature, the variable supportive supervisor is found to be positively related to creative behavior of

workers (Amabile, et al., 2004; Cummings & Oldham, 1997; Madjar et al., 2002; Oldham & Cummings, 1996; Tierney & Farmer, 2002).

It is assumed that supervisors' support may have critical implications on the employees' level of work motivation, and this enhanced motivation is later transformed into creative behavior. The types of support extended by the supervisors include bestowing inspiration and guidance, supporting and motivating employees to perform and reach their full potential and at the same time being empathetic towards them (Egan, 2005). It is suggested that through the encouragement and concern shown by supervisors, employees' will develop their feelings of self-determination and personal initiative at work (Deci & Ryan, 1987, 2000). These positive feelings will then boost the subordinates' motivation and interests in their work activities and later enhance creative behavior (Oldham & Cummings, 1996; Deci & Ryan, 1987, 2000).

The opposite of supportive supervisory style is controlling style. Findings from previous studies consistently found that controlling or limiting style is found to have a negative influence on work motivation and hence, inhibit the creative behavior of their employees (Deci et *al.*, 1989; Deci &Ryan, 1985; 1987; Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999). Supervisors who demonstrate controlling supervisory style engage in close monitoring of employees' behavior, practice authoritative decision making and do not express empathy towards their employees (Amabile et al., 2004; Cummings & Oldham, 1997; Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999). Previous research findings confirmed that under controlling supervision, the level of employees' work motivation would diminish and

later negatively affect the creative performance of the employees (Cummings & Oldham, 1997; Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999).

Given the importance of the established relationships between supervisor and subordinate in the work context, supervisory styles will be selected as the predictor of creative behavior. Furthermore, the intervening effect of work motivation on the supervisory styles and creative behavior relationship will be examined in this study. Therefore, it is postulated that supervisory styles will exert important influence on the predictor-work motivation-dependent variable correlation.

2.6 The Mediating Effect of Motivation

The manifestation of creative behavior that is to find novel and useful solutions and outcomes requires an individual to invest a lot of effort, energy and time (Amabile, 1983; Redmond, Mumford and Teach, 1993; Kim, 2000). Hence, a high level of motivation or the drive to retain one's energy in pursuing a task is prerequisite for creative behavior. Motivation has become an important research topic for creativity studies and substantial research evidence on the effect of motivation on creativity and creative behavior has accumulated over almost 30 years (e.g. Amabile 1985; 1988; Deci & Ryan, 1985; Oldham & Cummings, 1996).

Previous works on motivation have theoretically and empirically supported that motivation could be classified into two distinct categories: intrinsic and extrinsic. Intrinsic motivation is the type of motivation that arises by performing the task itself (Amabile, 1997). The person experiences enjoyment, excitement and satisfaction while performing the job given. Extrinsic motivation, on the other hand derives from

other factors rather than the job itself. A person who is extrinsically driven will perform the job given in order to obtain some tangible rewards such as monetary gain or to meet a constraint imposed by extrinsic source for example a deadline (Amabile, 1997). Although motivation is an important influence on creative behavior, intrinsic and extrinsic motivation might have different ways in affecting how people engage in creative activities.

Earlier studies on the effect of motivation on creative behavior proposed that only intrinsic motivation will significantly influence creative behavior (Amabile et al., 1990; Oldham & Cumming, 1996; Kim, 2000). Employees with a high level of intrinsic motivation are supposed to be highly focused on the task, to be more open to explore different ways to solution and original ways to solution and original in approaching a problem, to be playful with ideas and are more likely to be risk takers (Amabile et al., 1990; Oldham & Cumming, 1996). Intrinsic motivation also explains about excitement experienced by a jobholder to engage in job activities for the sake of performing the job itself (Amabile, 1983; Oldham & Cummings, 1993). The result from a study by Ruscio et al. (1998) also supported the basic model of intrinsic motivation and creativity. The findings supported that intrinsic motivation as well as task behavior can have a positive effect on creativity.

In line with the abovementioned view of intrinsic motivation, Amabile's Intrinsic Motivation Principle of Creativity suggested that only intrinsic motivation counts in determining individuals' creativity. This principle posits that individuals will be more creative if they are intrinsically driven by their interests and satisfaction in performing their creative work. Other kind of motivation that is extrinsically driven will

undermine the positive intrinsic motivation effects on creative performance (Deci & Ryan, 1985; Amabile, 1998). Thus, extrinsic motivation is detrimental to creative behavior.

However, more recent studies found contradictory results on the effect of extrinsic motivation on creativity. Amabile (1996) has come up with a new Intrinsic Motivation Principle of Creativity that describes the effects of extrinsic motivation. Extrinsic motivation that is considered as informational or enabling is perceived to have positive effects on employees' creativity. This type of extrinsic motivation is believed to be conducive towards enhancing individuals' creative behavior, particularly when the initial levels of intrinsic motivation are high (Amabile, 1996).

The concept of work motivation that comprises both intrinsic and extrinsic motivation in one broad construct has been introduced to explain the effects of both types of motivation on personal outcomes including performance. Amabile (1997) and Katzell and Thompson (1990) recommended work motivation as a requirement before individuals are willing to invest their time and effort towards performing any task given to them particularly to engage with creative attempts. For individuals to be creative, they have to be focused and motivated to generate novel and useful outcomes or solutions (Kim, 2000). Kim (2000) based on the description given by Katzell and Thompson (1990) defined work motivation as the situations and processes that explain arousal, magnitude, direction and maintenance of effort to engage in creative behavior.

According to Amabile (1997) and Kim (2000) the concept of work motivation

emphasizes the importance of the synergistic effect of intrinsic and extrinsic motivation on creative behavior. To support this view, motivation is viewed as multidimensional constructs that are located on a continuum. The constructs of motivation are intrinsic motivation and the four types of extrinsic motivation are integrated, identified, introjected and external regulated and amotivation (refers to a state of relatively absent of motivation). Amabile (1996) argued that intrinsic motivation is found to be conducive to creative behavior as well as extrinsic motivation dimensions that are enabling and informative. For instance, reward that enhance one's competency in performing the job will enhance intrinsic motivation. Only the controlling form of extrinsic motivation is found to be detrimental to any self-determined behavior including creative behavior (Amabile, 1996). This is known as the Amabile's new Motivation Principle of Creativity.

In this study, it is more insightful to consider both intrinsic and extrinsic motivation as constituent that will expound the relationship between the independent variables and creative behavior. Thus, work motivation will be treated as the intervening variable. According to SDT, once needs are fulfilled, motivation is a critical condition that will lead to positive individual outcomes and in this case, creative behavior (Amabile, 1996; Deci & Ryan, 2000; Gagne & Deci, 2005). Hence, the synergistic effect of extrinsic behavior in sustaining and retaining interest to pursue the intrinsically motivated activities will be captured in this study.

2.7 The Moderating Effect of Job Involvement

Job involvement is an attitudinal construct defined as "the degree to which one is

cognitively preoccupied with, engaged in and concerned with one's present job" (Paullay et al., 1994; Rotenberry & Moberg, 2007); the extent to which a person identifies with his or her job (Blau, 1985; Blau &Boal, 1987). Kanungo (1982) states job involvement is a description of how an employee believes his/her present job can satisfy his/her needs. When the person is highly involves with his/her job, the person is said to engage in the process of internalizing the values of the goodness of the job (Blau & Boal, 1987).

For a highly involved person, the job is considered to be a significant element in the person's life. It is postulated that how well the person performs his/her job is an important determinant of his/her esteem (Kanungo, 1982; Blau & Boal, 1987). Hence, the level of one's involvement in his/her job determines one's self-image. Good performance at work signifies good feeling about oneself and definitely important for the development of his/her self-image. Due to this, a highly involved person is genuinely interested in and highly concerned about his/her job and how he/she performs the job (Blau & Boal, 1987). Thus, a highly involved individual is expected to put in a high level of effort in performing his/her tasks (Blau & Boal, 1987; Terborg, 1977).

Job involvement is an affective reaction to the job (Igbaria, Parasuraman & Badawy, 1994) and is concerned with employee identification with work experience (Rotenberry & Moberg, 2007). Although the concept of job involvement is related to other individual outcomes such as job satisfaction, career commitment and organizational commitment, job involvement is empirically and conceptually distinct from those constructs (Igbaria, Parasuraman & Badawy, 1994). Job involvement

revolves around one's concern of his/her immediate work activities whilst commitment is more closely related to one's attachment to the organization (Blau & Boal, 1987; Rotenberry & Moberg, 2007).

Blau and Boal's (1987) description of job involvement could be employed to summarize the discussion above. According to Blau and Boal's (1987), job involvement refers to: a) the degree of importance of one's job to one's self-image; b) the degree to which an individual is actively participating in one's job; and c) the degree to which a person's self-esteem is affected by the person's level of perceived achievement.

Previous researchers approached the concept of job involvement from two distinct approaches. The first approach regards job involvement as an individual variable. Job involvement is believed to be the function of certain personal factors, needs or values (Rotenberry & Moberg, 2007). Gender, age, personality type and level of control have been identified as variables related to job involvement. The second approach looks at job involvement as the outcome of the interaction between the person and his/her environment. Job involvement is regarded as an individual's response to a specific work condition or characteristics (Rotenberry & Moberg, 2007). In other words, certain aspects of the job influence the degree to which an individual becomes involved in his/her job. A few variables that have been studied and postulated to have relationships with job involvement are supervisor's behavior, participative decision making and elements of the job characteristics model that are task identity and significant, skill variety, autonomy and feedback (Rottenberry, & Moberg, 2007).

In the literature, job involvement is an ongoing research interest. For the past 35 years researchers such as Brown (1996), Kanungo (1982), Kahn (1990), Lodahl and Kejner (1965) and Pfeffer (1994) have shown interests in examining the effects of job involvement on individual and organizational outcomes particularly performance. Earlier attempts to test the effect of job involvement on performance have met limited success (refer to Brown, 1996; Lassk et al. 2001 and Mathieu & Farr, 1991). Diefendorff et *al*. (2003) and Rottenberry and Moberg (2007) reasoned that this is due to the inferior measures used in these studies. Brown (1996) in his meta-analysis found that job involvement is not directly related to the general overall performance and affects performance in an indirect way. A few recent studies on job involvement, on the other hand, yield contradictory results. There is a positive relationship between job involvement and a few individual outcomes that include organizational citizenship behavior and in-role performance (Diefendorff et *al.*, 2003; Rottenberry & Moberg, 2007).

According to Rottenberry and Moberg (2007), job involvement is one of the important factors that influence organizational effectiveness and individual motivation. Furthermore, employee's job involvement has been predicted to have a significant impact on numerous organizationally important outcomes. A highly involved employee will lead to better organizational functioning (Pfeffer, 1994) in the away that the employee is engrossed with his/her work. For a highly involved person, the job itself can serve as the nutriment that helps fulfill his/her growth needs (Kanungo, 1982; Blau & Boal, 1987). A high level of involvement and enthusiasm in one's work will lead to an increase in motivation that later influence job performance

and other relevant outcomes such as absenteeism and turnover (Diefendorff et *al.*, 2002; Rottenberry & Moberg, 2007). Researchers (e.g. Kahn, 1990; Kanungo, 1982; Lawler, 1986; Rottenberry & Moberg, 2007) stipulated that an employee who is highly involved in his/her job will exert substantial effort to perform and help the organization attains its objectives. In contrast, an employee with a low level of employee involvement is hypothesized to be "away" or withdrawn from his/her job. According to Kanungo (1979), low-job involved employee is more likely to consume his/her energy on tasks outside the requirement of the job and engage in various unproductive doings while at work. Diefendorff et al. (2003) and Rottenberry and Moberg (2007) suggested that job involvement should be hypothesized as having an important effect on employee's motivation and effort and subsequently determined performance. Hence, in this study job involvement will be introduced as a moderator that could possibly affect the predictors-motivation-creative behavior relationships.

2.8 Conclusion

This chapter presents the reviews of literature on creative behavior, creativity and the factors influencing creative behavior. The discussion on factors influencing creative behavior is approached using the multi-level perspective with the focus on relevant contextual factors that could influence creative behavior. In addition, the discussion of the underpinning theories, the SDT and POS is also included in this chapter. The final section presents the discussion on the mediating and moderating variable of the study. In the next chapter, the framework for the study, hypotheses development and discussion on research design are presented.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The gist of this study is to establish the relationship between selected contextual factors (supervisory styles, job characteristics dimension of autonomy, innovation-oriented value culture, reward and stressors), work motivation, and creative behavior. In addition, job involvement will be introduced as the moderator. This chapter elaborates on the research framework as well as discuss the hypotheses development for the study. This chapter also attempts to describe the research design and method used to achieve the objectives of the study. Specifically, this chapter explains the research approach, sampling design, questionnaire development, data collection, and methods of data analyses.

3.2 Research Framework

This study aims to examine the relationships between the independent, intervening, moderator, and the dependent variables. In this study, self-determination theory (SDT) (Deci & Ryan, 1985) provides the primary theoretical basis for the proposed framework. As discussed in the previous chapter, the OST is applied to identify the contextual factors that will be

explored in this study. The factors are supervisory styles, autonomy dimension of job characteristic, innovation-oriented value culture (IOVC), reward, and stressors.

SDT sets a framework that emphasizes the importance of the stimulants in the environment that trigger work motivation within a person. Work motivation is triggered when these stimulants or the contextual factors act as feeders to fulfil the specific needs of a person that are required to enhance work motivation. It is postulated that a high level of motivation is a precondition for creative behavior.

According to SDT, the contextual factors will not only have positive generative power on creative behavior among individuals at the workplace but there are stimulants (e.g. the presence of stressors) within the environment that would have negative effects on work motivation and subsequently hinder creative behavior (Egan, 2005; Kazanchi & Nazarian, 2010; Lepine, Podsakoff & Lepine, 2005; Lin et al., 2010; Williams, 2004). Therefore, to provide a more in-depth exploration of the influence of the context on creative behavior, this study aims to examine both facilitating and hindering factors simultaneously in a single attempt. Furthermore, to further strengthen the framework, the intervening effect of work motivation and the moderating effect of job involvement on the independent-dependent variables relationships will also be tested. Figure 3.1 illustrates the research framework that will be the basis of the present study.

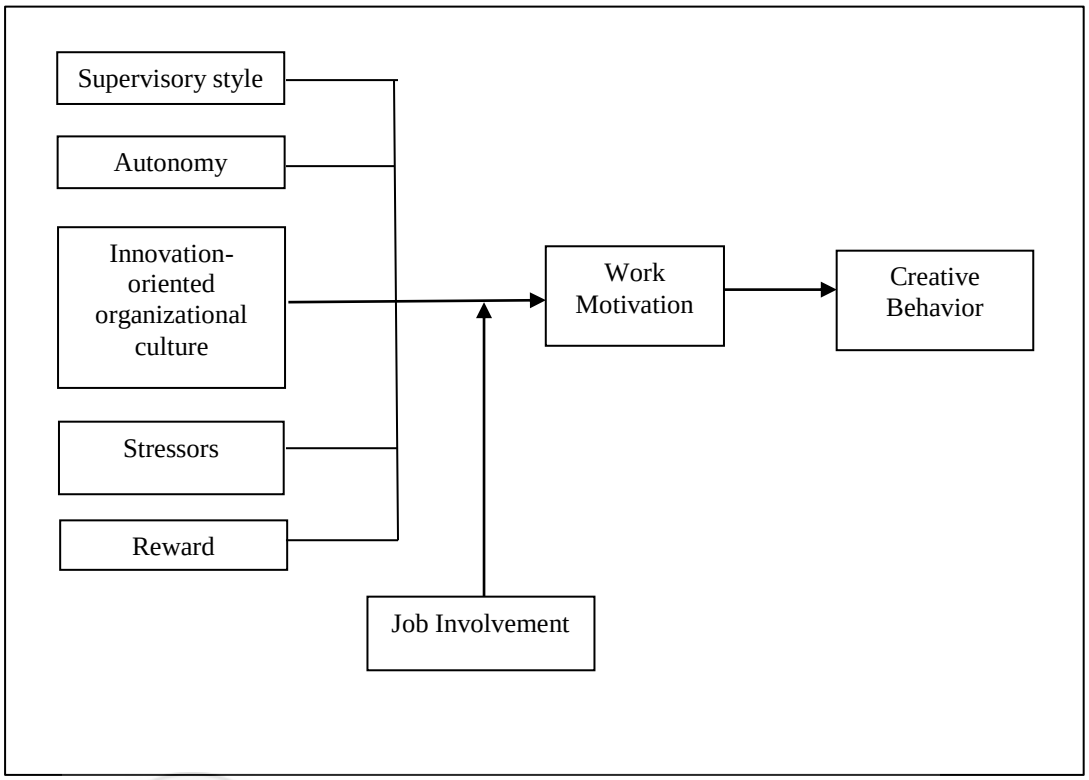

Figure 3.1
Theoretical Framework of the Present Study

The following section discusses the hypothesized relationships between the contextual factors (both the hindering and enabling factors), work motivation, and creative behavior. The section also explains how job involvement is hypothesized to moderate the context-work motivation relationship.

3.3 Hypotheses Development

3.3.1 Contextual Factors, Work Motivation, and Creative Behavior

3.3.1.1 Work Stressors

One of the predictors that were examined in this study was work stressors.

From a stimulus perspective, work stressors refer to factors in the environment particularly at the workplace that might be harmful to an individual well-being (Beehr et al., 2000). However, LePine, Podsakoff and LePine (2005) argued that stressors might also have a positive effect on individuals in a way that these stressors can positively influence motivation and facilitates work performance. Stress is a relationship between the individual and the situation. The person will consistently engage in cognitive evaluation of the situation in order to understand his or her reactions, emotionally and psychologically (Lazarus, 1991; Perrewe et al., 2004). It is argued that if the demand created by the environment or situation is deemed threatening or exceeds the person's resources, stress will be produced. Stress, therefore, is a form of reaction that will be triggered if an individual is being exposed to threats or stressors. The stimulus approach seeks for how the environment triggers a condition that necessitates an individual's adaptive response (Byron, Kazanchi, & Nazarian, 2010; LePine, Podsakoff, & LePine, 2005). Examples of stressors are conflicting demand, role overload, competition, time constraint, role conflict, ambiguity in performing one's tasks and workplace hazards.

LePine, Podsakoff, and LePine (2005) suggested that stressors can be categorized into two types- challenge and hindrance stressors. Challenge stressors refer to the type of stressors that have positive effects on individual motivation and performance such as creative behavior. Challenge stressors such as high work load, time pressure, and high responsibility offer stressful demand that will be viewed by managers as obstacles to be overcome in order to learn and achieve. Therefore, when individuals are exposed to the

challenge stressors, they will be motivated towards goal achievement and growth (LePine, Podsakoff, & LePine, 2005).

The other type of stressors, the hindrance stressors, are viewed as demands that are stressful and viewed by individuals as unnecessary and negatively influence their motivation and thus hindering growth and performance (LePine, Podsakoff, & LePine, 2005). Examples of the hindrance stressors are role ambiguity, role conflict, and organizational politics.

Beehr et al. suggested that challenge stressors would have a positive effect on motivation and would facilitate creative behavior. This type of stressors increases arousal which elicits the use of creative thoughts and motivates engagement in creative strategies in order to perform one's task (Beehr et al., 2000). When individuals are being exposed to challenge stressors, they will evaluate the situation as potentially promoting mastery and as an avenue to learn and becoming more competent at work or solving the task at hand in an efficient manner (LePine, Podsakoff, & LePine, 2005). From the self-determination perspective, these stressors will help fulfil the needs of competence and autonomy to enhance work motivation. As a result, individuals are more willing to spend their effort, time, and other resources or the demonstration of creative behavior to overcome the challenge.

On the other hand, distraction arousal theory postulates that hindrance stressors could negatively influence motivation and decrease creative performance (LePine, Podsakoff, & LePine, 2005). According to this theory,

humans have limited pool of cognitive resources and innately will respond appropriately when being exposed to a particular situation (Baron, 1986). Humans too will engage in the most suitable strategies to attend to the situation and to solve their problems. When they utilize some of these resources to attend to stressors that are regarded as unnecessary, for example, to deal with conflict at work, this will leave fewer cognitive resources available to attend to more important tasks such as performing the job. Consequently, when performing their jobs, individuals will resort to engage in simpler cognitive strategies and this will have a negative influence on creative behavior (Byron, Kazanchi & Nazarian, 2010). Hence:

Hypothesis 1: Work motivation will mediate the relationship between stressors and creative behavior.

3.3.1.2 Autonomy

Apart from supervisory styles, this study also aims to examine autonomy as a critical dimension of job characteristics identified by past scholars (e.g. Amabile, 1985, 1988; Hackman & Oldham, 1980; Oldham and Cummings, 1996) that will have influence on both work motivation and creative behavior. Amabile et al. (1996) suggest that autonomy elicits experienced responsibility of a jobholder. Autonomy refers to the extent to which a job provides freedom, independence, and allows the job incumbent to exercise a high degree of discretion in scheduling and deciding on the procedures to perform a given job (Kreitner & Kinicki, 1998). A person performing his/her job with

high autonomy is expected to believe that he/she is directly responsible for the results of his/her effort and thus experienced more accountability for the work outcomes (Kreitner & Kinicki, 1998). As argued by Deci and Ryan (1985), the most important element of self-determination is the ability to choose. According to Deci et al. (1989), and Hackman and Oldham (1980), the belief of freedom, accountability and responsibility will lead to the fulfillment of needs particularly the needs of autonomy and competence and later enhance work motivation of the job incumbent. A highly motivated employee is expected to concentrate all of his/her attention and effort on the job and expected work performance transpires. This means that if the jobholder is given the freedom and discretion in performing his/her job, work motivation is triggered and thus creative behavior is manifested as well (Oldham & Cummings, 1996; Shalley & Gilson, 2004). Hence, the following hypothesis is offered:

Hypothesis 2: Work motivation will mediate the relationship between autonomy and creative behavior.

3.3.1.3 Innovation-oriented Value Culture (IOVC)

Innovation-oriented value culture (IOVC) is described as the set of shared beliefs, values, heroes, assumptions, artefacts, and rules that underlie an organization's creative identity that guide and dictate creative thinking, behavior, and outcomes (Navaresse, 2008; Phelan, 2001; Quinn, 1988; Spreitzer, 1992). IOVC reflects the perceived degree of creative mindset that

is nurtured in the organizational environment. Organizations with IOVC support encourage and nurture activities and efforts that will result in creative outcomes through the allocation of resources, allowance for slacks, decentralization and encouragement of employees' autonomy and decision making (Navaresse, 2008). Being regarded as the strongest driver of invention and radical innovation, the innovative trait of firms' internal culture will help the organization and its people to overcome the hindrances in the environment and thus, flourish creative effort (Thellis, Prabhu & Chandy, 2009).

From the self-determination perspective, all of these characteristics in the work environment will serve as nutriments that lead to the fulfilment of needs required to enhance work motivation. This is consistent with Chan's (2003) assertion that IOVC is directly and positively related to the level of employee's perception on his/her level of competence, self-determination, impact and meaning that describe motivation of an individual employee. As a result, creative behavior is expected from employees working in an organization that nurtures IOVC. Hence, the following hypothesis is offered:

Hypothesis 3: Work motivation will mediate the relationship between innovation-oriented value culture and creative behavior.

3.3.1.4 Rewards

Rewards are considered external factors used to reinforce desirable outcomes (i.e. creative behavior) by fulfilling needs and enhancing motivation. In

management literature, rewards are tools used by management of corporations to motivate employees to attain both their personal as well as organizational goals (McKenzie & Lee, 1998; Navaresse, 2008).

This study hypothesizes that rewards will have a positive effect on creative behavior, as demonstrated by previous studies (e.g. Eisenberger & Armeli, 1997, 1998; Eisenberger & Rhoades, 2001). Reward is postulated to have positive effects on work motivation of employees because if they are being administered to indicate good performance, the competence and autonomy needs will be fulfilled and later positively influence employees' motivation (Amabile, 1996; Deci & Ryan, 1980). As suggested by Amabile's New Motivation Hypothesis (1983, 1996), rewards affect work motivation and thus enhance creative behavior of employees as long as the rewards administered provide feedback.

To rearticulate, administering reward that is informative or that provide feedback about employees' performance will enhance work motivation and later positively influence creative behavior of employees. Therefore, the following hypothesis is formulated:

Hypothesis 4: Work motivation will mediate the relationship between rewards and creative behavior.

3.3.1.5 Supervisory Styles

Amabile and Gryskiewicz (1989), Deci and Ryan (1987), and West and Farr (1989) argue that one of the most salient factors of the organizational context that influences employee work motivation and creative behavior is style of supervision. Supportive or non-controlling supervision is expected to enhance employee work motivation and subsequently creative behavior (Redmond, Mumford, & Teach, 1993). Limiting or controlling style of supervision is expected to be detrimental towards employee motivation and consequently creative behavior (Kim, 2000). Results from a study by Oldham and Cummings (1996) have shown that subordinates who rated their supervisors as non-controlling or supportive tended to be more creative than their counterparts who rated their supervisors as showing controlling behavior towards them.

In this study, supportive supervisory style refers to a supervisor who shows a high level of concern for employees' feelings and needs, encourages the employees to voice their concerns, always provides positive feedback, mainly informational feedback to improve performance, and facilitates employee development. Consistently, Deci and Ryan (1987) and Redmond, Mumford and Teach (1993) contend that supportive supervisors are more willing to provide the required information, support and resources to their subordinates as well as allow their subordinate to perform their tasks independently. By demonstrating these qualities, supportive supervisors are expected to promote employee's feelings of self-determination and personal initiative at work,

which should then boost levels of interest and motivation in work activities (Amabile, 1996). Amabile (1988, 1996), Kim (2000) and Tierney, Farmer and Graen (1999) argue that motivated employees are more willing to invest their time and effort towards performing their tasks and likely to come up with creative outcomes as in this case the demonstration of creative behavior. Based on the above, the following hypothesis is offered:

Controlling supervisory style, on the other hand, is postulated to diminish work motivation and later negatively influence creative behavior. Supervisors who have controlling style of supervision is expected to closely monitor their subordinates, reject employees' inputs in decision making, and most likely force employees to think and act in a prescribed manner (Deci et al, 1989; Oldham & Cummings, 1996). As noted by Deci et al. (1989) and Deci and Ryan (1987), when employees are limited in their action, they will demonstrate lower creativity in their work as more of their attention and energy will be shifted away from creative effort towards complying with the demands of the supervisor. Furthermore, employees in this situation will be more pressured and therefore will start to change their focus on other non-work concern especially in dealing with conflict and friction (Zang & Bartol, 2010). Therefore, work motivation is reduced and it is expected to lower creative behavior (Oldham & Cummings, 1996). Hence, the following is proposed:

Hypothesis 5: Work motivation will mediate the relationship between supportive style and creative behavior.

3.3.2 Work Motivation and Creative Behavior

Over the past 20 years, empirical evidence has showed that motivation is one of the most important predictors of creative behavior (Amabile et al., 1985; 1988; Deci & Ryan, 1985, 2000; Gagne & Deci, 2005; McCrae, 1987; Oldham & Cummings, 1996; Ruscio et al., 1998; Vallerand, 2000). Work motivation refers to a construct that is relevant to the conditions and processes that arouse, direct and sustain effort of a person to engage in certain activities or to perform a job (Katzell & Thompson, 1990). Employees with a high level of motivation are expected to be free of superfluous concerns, to be more likely to explore new ways of solving problem, to be playful with ideas, and are more ready to take risks (Amabile et al., 1990; Oldham & Cumming, 1996).

Intrinsic motivation is defined by many researchers in the area of creativity (e.g. Amabile, 1985; Oldham & Cummings, 1996; Ruscio et al., 1998; Stafford, 1998; Vallerand, 2000) as the motivation to engage in activity for its (i.e. the job) own sake. However, intrinsic motivation is not the only explanation for employees to engage in creative behavior. Another type of motivation which is extrinsic motivation should be considered as another influence that also affects creative behavior. As proposed by Amabile's New Principles of Motivation, extrinsic motivation is not necessarily detrimental and has undermining effect towards intrinsic motivation. Herzberg's Two-Factor Model provides explanation for this.

Herzberg's Two-Factor Model posits that motivation is influenced by two separate sets of factors known as the hygiene and motivational factors. Hygiene or maintenance factors are crucial to bring employees to a neutral state. Thus, the presence of these hygiene factors is necessary for developing a basis on which to create a reasonable amount of motivation. However, these hygiene factors are not sufficient to motivate employees. Another set of factors, the motivational factors or satisfiers operate primarily to build motivation. A more complex interaction between both internal and external factors and the investigation of the conditions in which employees respond to different type of stimulus provided by the environment is the essence of this theory (Basset-Jones & Llyod, 2005).

Herzberg offers a new perspective of the duality concept of the hygiene-motivator. The hygiene-motivational component of Herzberg's theory will help explain the assumption that intrinsic and extrinsic motivation are caused by two different sets of factors and do not necessarily have detrimental effects on each other. This is consistent with Amabile's (1997) suggestion that intrinsic and extrinsic motivation will have synergistic effects on creative behavior. This can be explained by stating that any type of extrinsic factors that can support one's sense of self-determination should interrelate positively with factors that elicit intrinsic motivation and hence, boost creative behavior among employees. As a result, Amabile (1994) introduces the concept of work motivation that comprises intrinsic motivation and certain aspects of extrinsic motivation.

As explained earlier, work motivation expounds the excitement experienced by a jobholder to engage in job activities for the sake of performing the job itself (Amabile, 1983; Oldham & Cummings, 1993). According to Hackman and Oldham (1980), a job incumbent will be motivated if he or she is given the freedom and flexibility in performing his/her job, as well as able to obtain direct and clear feedback. When a job incumbent experiences a high level of intrinsic motivation on the job, he/she will exhibit good work performance since effective performance is self-rewarding (Hackman & Oldham, 1980). One possible work outcome resulting from high level of work motivation would be in the form of creative behavior and the generation of more creative outcomes (Hackman & Oldham, 1980). A study by Zhou (2000) also supported the basic model connecting work motivation and creative behavior. Therefore, the next hypothesis is offered:

Hypothesis 6: Work motivation is positively associated with creative behavior.

3.3.3 The Moderating Effect of Job Involvement

Job involvement is introduced as a moderating variable in this study. Hackman and Lawler (1971) suggest that one of the important factors that influence positive individual outcomes such as high level of motivation is job involvement. Job involvement is an attitudinal construct that has been defined as "the degree to which one is cognitively preoccupied with, engaged in and concerned with one's present job"(Paullay et al., 1994, p. 225) and as "the

extent to which a person identifies with his or her job" (Blau & Boal, 1987, p. 290).

Kanungo (1982) defines job involvement as description of how an employee believes his/her present job can satisfy his/her needs. When the person is highly involved with his/her job, the person is said to engage in the process of internalizing the values of the goodness of the job. The job is considered to be a significant element in the person's life to the extent that how well the person performs his/her job is an important determinant of his/her esteem. One's self-image is determined by the level of one's involvement in his/her job (Kanungo, 1982; Blau & Boal, 1987). For a highly involved person, good performance at work signifies good feeling about oneself and this feeling is important to one's self-image. Due to this, a highly involved person genuinely cares for and is highly concerned about his/her job and how he/she performs the job (Blau & Boal, 1987). Thus, a highly involved individual is expected to put in a high level of effort in performing his/her work activities. Blau and Boal (1987), and Terborg (1977) define effort as the amount of time spent on performing the activities or tasks.

An employee who is highly involved is attracted with his/her job and should be most motivated by the job (Blau & Boal, 1987). For a highly involved person, the job itself can serve as the nutriment that helps fulfill his/her growth needs (Kanungo, 1982; Blau & Boal, 1987). Diefendorff et al. (2003) and Rottenberry and Moberg (2007) argue that job involvement should be hypothesized as having an important effect on employee's motivation and

effort. Hence, the following hypothesis is formulated:

Hypothesis 7: Employee involvement will moderate the relationship between the contextual factors and work motivation.

3.4 Research Design

As mentioned earlier, this study intends to investigate the relationship between selected contextual factors (stressors, job characteristics, innovation-oriented value culture, reward and supervisory styles), work motivation, job involvement, and creative behavior among employees in the organizations.

To achieve the aim of the present study, a survey will be employed as the main research design. The use of survey is appropriate because in this research, the primary aim is to gather the researchers' opinions on the factors that influence their creative behavior while performing their work. Cooper and Schindler (2001) argue that conducting a survey is an excellent way of collecting abstract information of all types, particularly on opinions and attitudes as well as on intentions and expectations. Furthermore, this data collecting technique is considered more efficient and economical than observation (Cooper & Schindler, 2001). Given the strengths discussed earlier, in this study, survey will be used as the primary data collection approach.

This study is a correlational study. A correlational study is appropriate as the

aim of this study is to identify important factors associated with the creative behavior (Sekaran, 2003). Data will be collected at one point of time or cross sectional. This method of data collection is appropriate since the study attempts to explore the respondents' opinion on how they believe that certain aspects of their work environment influence their creative behavior at work.

3.5 Population and Sampling

As suggested by Sekaran (2003) and Zikmund (2003), to take a more practical approach while maintaining reliable results, sampling was conducted in this study. In statistics, quality assurance and survey methodology, sampling is concerned with the selection of a subset of individuals from within a statistical population to estimate characteristics of the whole population. The discussion on sampling is presented in the next section.

3.5.1 Population and Sample

The unit of analysis is the individual. In this study, individual-level analysis is justified because the demonstration of creative behavior at work by individual employees specifically when they engage in performing R&D activities is observable and can be better explained at the individual level. Hence, data were collected from each individual employee selected to represent his/her insight about the phenomenon under study.

As a matter of practicality, sampling was conducted in this study. As

suggested by Cooper and Schindler (2001), the reasons for conducting sampling are as follows: (1) lower cost; (2) greater accuracy of results; (3) greater speed of data collection; and (4) availability of population elements. Thus, sampling is more effective to obtain information on the subject matter while maintaining the reliability of the results.

The sampling process follows the procedures suggested by Hair, Money, Samouel, and Page (2003).

1. The first step is defining the target population. The target population of this study was researchers who are currently involved in R&D projects in various fields and registered with the Malaysian Ministry of Science, Technology and Innovation (MOSTI). These researchers are employed either by government research institutes (GRI), private R&D companies (PRC) and universities categorized by MOSTI as R&D organizations. There were 43 GRI, 195 PRC and 14 universities. The current figure for number of researchers registered with MOSTI is 24, 000. These subjects are selected for the following reasons. Firstly, they are considered the core employees in these types of companies. Secondly, their job tasks involve creative activities at different stages, and lastly, their performance is considered very critical in ensuring the successful execution of the projects.
2. The second step is to choose the sampling frame. The current MOSTI's database served as the sampling frame from which the sample is drawn.

3. The third step is to choose the sampling technique. In this study, the simple random sampling technique was utilized. Further discussion on the sampling technique is presented in the next section.

4. Next is to determine the sample size. Sample size for this study consists of 378 researchers. The size of the sample is determined by using Krecjie and Morgan's (1970) table. It is specified that 378 should be selected as sample for a population of 24,000. Furthermore, in order to perform multivariate analysis, the sample size should be preferably 10 or more times of the number or variables being tested in the study (Bartlett, Kotrlik & Higgins, 2001; Miller & Kunce, 1973). Since in this study eight variables were examined, the required sample size therefore, should be at least 80.

3.5.2 Sampling Technique

The database retrieve from MOSTI served as the sampling frame or a listing of all the elements in the population which the sample was drawn for this research. To select 378 from 24,000 elements, the present study employed a simple random sampling or unrestricted probability sampling whereby every element in the population has a known and equal chance of being selected as a subject. As suggested by Cavana, Delahaye, and Sekaran (2001), simple random sampling is a technique that has the least bias and offers the most generalizability. In order to draw a sample using the simple random sampling method, the procedures suggested by Hair et al. (2003) would be followed.

1. Firstly, an identification number was sequentially assigned to every element in the sampling frame.
2. Next, a random number generator was used to identify the appropriate elements to be selected into the sample.
3. Finally, no element should be selected more than once.

3.6 Data Collection Procedure

The main data collection technique employed in the present study is questionnaire. According to Sekaran (2003), a questionnaire is an efficient data-collection mechanism to gather information on variables of interest when the researcher knows exactly what is required and how to measure these variables. Questionnaires provide a relatively cheap, quick and efficient way of obtaining large amounts of information from a large sample of people. Furthermore, data can be collected relatively quickly because the researcher would not need to be present when the questionnaires were completed. This is useful for large populations when interviews would be impractical.

The duration of the data collection was four months. Participants were given two weeks to respond. However, the response was not satisfactory after the deadline was over. A new set of questionnaire and a letter notifying the non-respondents that the questionnaire had not been received and repeating the basic appeal of the original letter were sent out to the respondents. Next, non-respondents were contacted personally, after a third cover letter and questionnaire were mailed again. Another two weeks were given to the respondents and after the new deadline, non-returned questionnaires were considered as non-respondents.

3.7 Questionnaire Design

The questionnaire contained measures of the variables being studied in this research. The questionnaire was divided into two parts. The first part consisted of questions on the participants' demographic profile. The second part was further divided into three sections: The first section dealt with questions on supervisory styles, autonomy, innovation-oriented value culture, reward, and stressors. The second section included questions on work motivation, and the third section contained items to measure the subjects' perception of their job involvement at work.

All in all there were 103 items asked. The items were structured in a simple manner to facilitate response from participants. The questionnaire was designed in a way that was easy to read by the respondents. It was estimated that respondents would take about 20 minutes to complete the questionnaire.

In addition to the questionnaire, an introductory letter was attached. The introductory letter served as the introduction of the researcher and the study to the respondents. In the letter, respondents were informed on the research contract promising complete anonymity. This was done to increase the motivation of respondents to cooperate without fear of potential reprisals.

In addition, a statement notifying the respondents that there is no right or wrong answers would be included in the letter. The aim was to ensure that respondents would respond to all questions as honest as possible (Cooper & Schindler, 2001). Respondents would be given two weeks to complete the questionnaire. A pre-addressed stamped envelope was also enclosed to facilitate return of the

questionnaires.

3.8 Variables and Measures

This section explains the variable measurements in this study. In addition, a brief discussion on the items and validity of the items were also be presented. Items measuring specific variable in the questionnaire are constructed using instruments from past research.

3.8.1 Creative Behavior

Creative behavior is a construct that is operationally defined as a behavior that results in identifying original and better ways to accomplish some purposes or developing solutions to job related problems that are evaluated as new and appropriate for any given situation (Shalley, 1991, 1995; Simon, 1985).

The instrument consists of five items, measured on a five-point Likert-like scale in which '1' "Not at all characteristics" to '5' "Very characteristic." The five items are: (1) I try to find out new ideas about technologies, work processes, and products; (2) I suggest creative ideas; (3) I am the first person among my co-workers to try new ideas and methods; (4) I do my job with very creative and practical ways; and (5) I try to approach solving a certain problem with new ideas or methods.

Table 3.1
Measurement of Creative Behavior (Employee)

Variable	Operational Definition	Items
Creative behaviour	Behavior that results in identifying original and better ways to accomplish some purposes or developing solutions to job related problems that are evaluated as new and appropriate for any given situation (Shalley, 1991, 1995; Simon, 1985).	1. I try to find out new ideas about technologies, work processes, and products. 2. I suggest creative ideas. 3. I am the first person among my coworkers to try new ideas and methods. 4. I do my job with very creative and practical ways. 5. I try to approach solving a certain problem with new ideas or methods.

3.8.2 Contextual Factors

The contextual factors that are selected to be examined in this study are factors that have been postulated to directly influence employees' motivation and later affect the expression of creative behavior among employees. These contextual factors are job-related factors. The factors are stressors, autonomy, innovation-oriented value culture, reward, and supervisory styles.

3.8.2.1 Stressors

Stressors are operationally defined as the factors in the environment particularly at the workplace that are harmful to an individual well-being (Lepine, Podsakoff, & Lepine, 2005) and they are role ambiguity, role conflict, work-family conflict and role overload. These types of stressors are considered as chronic or the type of stressors that are being thought as constant by employees and they are job specific

(Beehr et al., 2000). Research findings from Beehr et al. (2000) shown that chronic stressors that are job specific is a strong predictor of performance.

The instrument used to measure the four dimensions is adopted from Moss and Lawrence (1997), who developed it using items adopted or adapted from multiple sources. This instrument has been used repeatedly in stress literature and is chosen because they are expected to be relevant to the type of jobs and subjects being observed.

The instrument consists of 12 items, in which three items measure role overload, three items role ambiguity, three items conflicting demands, three items measuring work-family conflict, and role conflict respectively. Participants will be asked to rate the responses on a seven point Likert-like scale ranging from '1' "Very false" to '7' "Very true". For scoring purposes, the responses for all items will be summed up and higher scoring reflects higher level of stressors.

Table 3.2
Measurement of Stressors

Variable	Operational Definition	Items
Stressors	Stressors are operationally defined as the factors in the environment particularly at the workplace that are harmful to an individual well-being (Lepine, Podsakoff, & Lepine, 2005).	1. At work, your responsibilities seem to change from day to day and you have little control of the changes. 2. The explanation of what has to be done is not always very clear. 3. There is no specific evaluation criteria set up and you just don't know what is expected of you. 4. Also, you may report to two or more supervisors who are as different as night and day. 5. They may each desire 100 percent of your time and to please one would mean displeasing the other. 6. What is acceptable for one is inappropriate for the other. 7. The rigorous demand of work, especially overtime, sometimes requires you to cancel activities with your family and friends. 8. Or maybe you are already at the point where you just don't schedule activities anymore for fear that you'll end up cancelling them. 9. Those demands may also infringe upon your basic responsibilities in the home. 10. Deadlines, deadlines, and always deadlines. 11. You may find yourself with a pile of work on your desk and everything was due yesterday. 12. Simply put, you are always given either too much work or too little time to finish it.

3.8.2.2 Autonomy

Autonomy is one of the job characteristic dimensions proposed by Hackman and Oldham (1976) as to affect individual's experienced of responsibility of work outcomes. Autonomy is defined as the extent of individual freedom and discretion in the work and the scheduling of the work (Hackman & Oldham, 1980). The items used to measure the autonomy dimension of job characteristics are adopted from the Job Diagnostic Survey (JDS) developed by Hackman and Oldham (1980). The responses will be measured using the seven-point Likert-type answers where 1 represents "strongly disagree" while 7 represents "strongly agree". Three questions will be used to measure autonomy. They are: (1) How much autonomy in your work? That is to what extent does your job permit you to decide on your how to go about doing the work? (2) The job denies me any chance to use my personal initiatives or judgment in carrying out the work, and (3) The job gives me considerable opportunity for independence and freedom in how I do the work.

Table 3.3
Measurement of Job Characteristics Dimension of Autonomy

Variable	Operational Definition	Items
Autonomy	Autonomy is the extent of individual freedom and discretion in the work and the scheduling of the work (Hackman & Oldham, 1980).	1. How much autonomy in your work? That is to what extent does your job permit you to decide on your how to go about doing the work? 2. The job denies me any chance to use my personal initiatives or judgment in carrying out the work. 3. The job gives me considerable opportunity for independence and freedom in how I do the work.

3.8.2.3 Innovation-oriented Value Culture

Innovation-oriented value culture is one of the organizational culture dimensions, described as the set of shared beliefs, values, heroes, assumptions, artefacts and rules that underlie an organization's creative identity that guide and dictate creative thinking, behavior and outcomes (Navaresse, 2008; Phelan, 2001; Quinn, 1988; Spreitzer, 1992). Thus, in this study, innovation-oriented value culture (IOVC) refers to organizational willingness and encouragement towards risks taking, innovation and creativity (Ashkanasy, 2000).

Items for this variable will be adopted from Navaresse (2008). This 25-item instrument is the modified scale of the 38 items Team Climate Inventory by Anderson and West (1994). The items in this scale measure employee's perception about his/her company and the way people working with him/her including his/her your boss, team members, managers, CEO and others interact with him/her and among themselves. The items will be measured on a five-point Likert scale that ranges from '1' "strongly disagree" to '5' "Strongly agree".

All items will be summed up for scoring purposes in which the higher scores reflect high level of IOVC in the organization. Among the items asked are: "This organization is always moving toward the development of new answers," "understand the rules for the distribution of rewards," "People on this team are always searching for fresh, new ways of looking at problems," "This organization will continue its path of success by strictly adhering to standards and current procedures," "Someone who suggests a new method will probably be heard and

supported by managers," "Members are encouraged to share resources," "Members are encouraged to cooperate with each other in order to innovate," "In general this firm is a very innovative organization," and "This organization rewards creative people."

Table 3.4
Measurement of Innovation-Oriented Value Culture

Variable	Operational Definition	Items
Innovation – oriented value culture	Behavior that results in identifying original and better ways to accomplish some purposes or developing solutions to job related problems that are evaluated as new and appropriate for any given situation (Shalley, 1991, 1995; Simon, 1985).	1. This organization is always moving toward the development of new answers. 2. Proposing new ideas is NOT the best strategy to succeed in this organization. 3. This organization is open and responsive to change. 4. I understand the rules for the distribution of rewards. 5. People on this team are always searching for fresh, new ways of looking at problems. 6. This organization will continue its path of success by strictly adhering to standards and current procedures. 7. This organization encourages people to behave creatively.

3.8.2.4 Rewards

In the present study, rewards are operationalized as an individual's perception of the reward system utilized by his/her organization and how the employee perceives the rewards as an important aspect of his/her motivation. The instrument used to

measure this construct is adapted from Navaresse (2008) and consists of four items.

The four items will be measured on a five-point Likert scale. The responses range from '1' "Strongly disagree" to '5' "Strongly agree." The items are: "The opportunity to receive a reward for this activity played a significant role in directing my efforts," "I am motivated by the opportunity to receive monetary reward," "The reward offered was reasonable for this job," "I felt compelled to perform well because of the incentives I was guaranteed to receive." The summation of the responses will be used to measure the variable rewards and higher scores indicate employee's perception on the effectiveness of the reward in affecting their motivation and work behavior.

Table 3.5
Measurement of Rewards

Variable	Operational Definition	Items
Rewards	An individual's perception of the reward system utilized by his/her organization and how the employee perceives the rewards as an important aspect of his/her motivation (Navaresse, 2008).	1. The opportunity to receive a reward for this activity played a significant role in directing my efforts. 2. I am motivated by the opportunity to receive monetary reward. 3. The reward offered was reasonable for this job. 4. I felt compelled to perform well because of the incentives I was guaranteed to receive.

3.8.2.5 Supervisory Styles

Supervisory styles refer to the way the supervisor or leader treats his or her subordinate. It is a dual dimensional construct that constitutes supervisory support and supervisory control. Supportive style refers to style of supervision that shows concern for employees' feelings and needs, encourage them to express their concern, provide informational and positive feedback, facilitate employee skill and development (Deci & Ryan, 1987; Oldham & Cummings, 1996). Controlling supervisors, on the other hand demonstrate close monitoring of employee behavior, practice authoritative decision making and do not demonstrate empathy towards their employees (Amabile et al., 2004; Cummings & Oldham, 1997; Oldham & Cummings, 1996; Tierney, Farmer & Graen, 1999).

Both dimensions of supervisory style will be measured using a 12-item scale developed by Oldham and Cummings (1996), adapted from the Michigan Organizational Assessment Package (1975). Supervisory support is measured using eight items, whilst the remaining four items will be used to measure controlling supervision. Response options are rated on a seven-point Likert scale that ranges from '1' "strongly disagree" to 7= "strongly agree".

The items measuring supervisory support are: "My supervisor helps me solve work-related problems," "My supervisor encourages me to develop new skills," "My supervisor keeps informed about how employees think and feel about things," "My supervisor encourages employees to participate in important decisions," "My supervisor praises good work," "My supervisor encourages employees to speak up

when they disagree with a decision," "My supervisor refuses to explain his or her actions (reverse-coded)," and "My supervisor rewards me for good performance."

The items measuring controlling supervision are: "My supervisor always seems to be around checking on my work (reverse-coded)," "My supervisor tells me what shall be done and how it shall be done (reverse-code)," "My supervisor never gives me a chance to make important decisions on my own (reverse-coded)," and "My supervisor leaves it up to me to decide how to go about doing my job."

Table 3.6
Measurement of Supervisory Styles

Variable	Operational Definition	Items
Supervisory styles	Supportive is the style of supervision that shows concern for employees' feelings and needs, encourage them to express their concern, provide informational and positive feedback, facilitate employee skill and development while controlling supervision demonstrates close monitoring of employee behavior, practice authoritative decision making and do not demonstrate empathy towards their employees (Oldham & Cummings, 1996).	1. My supervisor helps me solve work-related problems. 2. My supervisor encourages me to develop new skills. 3. My supervisor keeps informed about how employees think and feel about things. 4. My supervisor encourages employees to participate in important decisions. 5. My supervisor praises good work. 6. My supervisor encourages employees to speak up when they disagree with a decision. 7. My supervisor refuses to explain his or her actions. 8. My supervisor rewards me for good performance. 9. My supervisor always seems to be around checking on my work.

Table 3.6 (Continued)

	10. My supervisor tells me what shall be done and how it shall be done.
	11. My supervisor never gives me a chance to make important decisions on my own.
	12. My supervisor leaves it up to me to decide how to go about doing my job.

3.8.3 Work Motivation

Work motivation can be broadly defined as a construct that pertains to the conditions and processes that account for the arousal, direction and maintenance of individual effort to engage in certain activities or to perform a job (Katzell & Thompson, 1990). Work motivation will be assessed using the Work Preference Index (WPI) developed by Amabile, Hill, Hennessey, and Tighe (1994). WPI is a 30-item paper and pencil inventory used to gauge intrinsic motivation scale (15 items) and extrinsic motivation scale (15 items). The internal consistency of intrinsic motivation subscale is .79, and extrinsic motivation subscale yields the internal consistency of .78.

Intrinsic motivation refers to "the motivation to engage in work primarily for its sake" whilst extrinsic motivation is defined as "the motivation to work primarily in response to something apart from the work itself" (Amabile et al., 1994, p. 50). Self-determination, competence, task involvement, curiosity, enjoyment and interest are intrinsic motivation elements being measured by this instrument, while elements

of extrinsic motivation being measured are competition, evaluation, recognition, money, or various incentives and constraints present in the environment. Responses are measured using a 5-point Likert type from '1' "Never or almost never true of me" to '5' "Always or almost always true of me". Among the items included in the WPI are "I am not that concerned about what other people think of my work", "To me, success means doing better than other people" "I enjoy relatively simple, straightforward tasks", "I seldom think about salary and promotions," and "What matters most to me is enjoying what I do". The summation of all responses (15 items for intrinsic motivation and 15 items for extrinsic motivation) will be used to measure WPI, and higher scores reflect high level of motivation (both intrinsic and extrinsic).

Table 3.7
Measurement of Work Motivation

Variable	Operational Definition	Items
Work Motivation	The conditions and processes that account for the arousal, direction and maintenance of individual effort to engage in certain activities or to perform a job (Katzell & Thompson, 1990).	1. I am not that concerned about what other people think of my work. 2. I prefer having someone set clear goals for me in my work. 3. The more difficult the problem, the more I enjoy trying to solve it. 4. I am keenly aware of the income goals I have for myself. 5. I want my work to provide me with opportunities for increasing my knowledge and skills. 6. To me, success means doing better than other people. 7. I prefer to figure things out for myself. 8. No matter what the outcome of a project, I am satisfied if I feel I gained a new experience.

Table 3.7 (Continued)

Variable	Operational Definition	Items
		9. I enjoy relatively simple, straightforward tasks.
		10. I am keenly aware of the goals I have for myself.
		11. Curiosity is the driving force behind much of what I do.
		12. I'm less concerned with what work I do than what I get for it.
		13. I enjoy tackling problems that are completely new to me.
		14. I prefer work I know I can do well over work that stretches my abilities.
		15. I'm concerned about how other people are going to react to my ideas.
		16. I seldom think about salary and promotions.
		17. I'm more comfortable when I can set my own goals.
		18. I believe that there is no point in doing a good job if nobody else knows about it.
		19. I am strongly motivated by the money I can earn.
		20. It is important for me to be able to do what I most enjoy.
		21. I prefer working on projects with clearly specified procedures.
		22. As long as I can do I enjoy, I'm not that concerned about exactly what I'm paid.
		23. I enjoy doing work that is so absorbing that I forget about anything else.
		24. I am strongly motivated by the recognition I can earn from other people.
		25. I have to feel that I am earning something for what I do.

Table 3.7 (Continued)

	26. I enjoy trying to solve complex problems.
	27. It is important for me to have an outlet for self-expression.
	28. I want to find out how good I really can be at my work.
	29. I want other people to find out how good I really can be at my work.
	30. What matters most to me is enjoying what I do.

3.8.4 Job Involvement

Kanungo (1980) asserts that job involvement relates to the psychological identification to a specific job and the ability of the job to fulfill a person's needs. Since this study is interested to explore job involvement in the present job's context, Kanungo's definition and measurement of job involvement was adopted.

The 10-item instrument used to measure job involvement was adopted from Kanungo (1982). The instrument is widely used among researchers in social psychology particularly to measure job involvement from the motivational perspective (Igbaria, Parasuraman & Badawy, 1994; Kanungo, 1982). Carmeli (2003) reported a Cronbach's alpha of .82, whilst Kanungo (1982) reported a reliability coefficient of .87. The instrument uses a 5-point Likert scale that ranges from '1' "Strongly disagree," to '5' "Strongly agree." The degree of job involvement will be measured by summing the responses of the ten items; high level of job involvement is indicated by the high scores.

Examples of a few items measuring job involvement are “The most important things that happen to me involve my present job”, “I am very much involved personally in my job”, “I live, eat, and breathe my job,” and “Most of my personal life goals are job-oriented”.

Table 3.8
Measurement of Job Involvement

Variable	Operational Definition	Items
Job Involvement	The extent to which the individuals identify psychologically with his or her job (Kanungo, 1982).	1. The most important things that happen to me involve my present job. 2. I’ll stay overtime to finish my job, even if I’m not paid for it. 3. To me, my job is only a small part of who I am. 4. I am a very much involved personally in my job. 5. Generally, I avoid taking on extra duties and responsibilities in my job. 6. I live, eat, and breathe my job. 7. Sometimes I’d like to kick myself for the mistakes I make in my job. 8. Most of my interests are centered around my job. 9. I have very strong ties with my present job which would be very difficult to break. 10. Usually I feel detached from my job. 11. Most of my personal life goals are job-oriented. 12. I feel depressed when I fail at something connected with my job.

Table 3.8 (Continued)

Variable	Operational Definition	Items
		13. I consider my job to be very central to my existence. 14. I have other activities which are more satisfying than my job. 15. I like to be absorbed in my job most of the time.

3.8.5 Demographic Information

In the last section of the questionnaire, a few questions were asked to seek for demographic information of the respondent. The demographic information that was collected in this study includes gender, age, race, educational level, employment background and information on achievement attained throughout the respondent's career as a researcher. These questions were asked at the end of the of the questionnaire and the reasoning may be that by the time the respondent reaches the end of the questionnaire, the individual was convinced of the genuineness of the questions posed by the researcher, and hence would be more open to sharing personal information (Cavana, Delahaye & Sekaran, 2001).

3.9 Pretest

Pretesting was conducted using a small sample of respondents with characteristics similar to the target population. As suggested by (Zikmund et al., 2010), data collected served as a guide to see if the selected approach and method will work as intended. The pretest involved several processes. First, questionnaire items were

pretested for face validity. Two academicians and two researchers participated in this process. This is sufficient considering Gay and Diehl's (1996) suggestion that two to three people should perform the pretesting of questionnaire before being actually used in the actual study in order to detect any deficiency and to acquire suggestions for improvement. Suggestions on the readability, clarity, accuracy of words and adequacy of the items for concept measurement were sought during this process.

3.10 Pilot Test

A pilot test is still required even though the items in the questionnaire had been adapted from a well-established instrument. This is due to the different group of respondents selected for the study. The respondents might come from different cultural and demographic backgrounds and it is expected that they would respond to the items differently.

A pilot test pilot test is conducted prior to an actual test is to ensure clarity of wordings and relevancy of the content being measured. For this research, to evaluate the items and assess the reliability value of each dimension in the instrument, a pilot test was conducted in December 2011 until February 2012. According to Hair et al (2007), in a research design, this process is considered critical to ensure accuracy and consistency of the data obtained via questionnaires. A total of 30 questionnaires were collected for the pilot test. Based on the responses and feedbacks from the respondents, refinements were being made to the original items. Table 3.9 shows the reliability value obtained from the pilot test for each construct.

Table 3.9
Reliability of Each Variable and Its Dimensions

Constructs	Cronbach's Alpha
Creative Behavior	0.85
Supervisory Styles	0.73
Autonomy	0.76
Innovation-Oriented Value Culture	0.83
Rewards	0.84
Stressors	0.81
Job Involvement	0.82
Work Motivation	0.91

3.11 Statistical Techniques

Several statistical tools and techniques were utilized in this study for the purpose of data analysis and hypotheses testing. Various statistical tools in SPSS version 18.0 and SEM-PLS (Partial Least Square) version 2.0 were employed for this purpose. Moreover, this study used both descriptive and inferential statistical methods. Descriptive statistics method helped to summarize the obtained data by describing the characteristics of the respondents whilst the inferential statistics method was utilized to test the hypothesized relationships in this study.

3.11.1 Preliminary Analysis and Descriptive Statistics

In descriptive analysis, raw data were transformed into a form that would provide information to describe a set of factors in a situation that will make them comprehensible and interpretable (Sekaran, 2003; Zikmund, 2000). This analysis gave a feel for data through the frequency distribution, central tendency, and dispersion. Descriptive statistics including means, range, standard deviation and

variance were obtained from the interval-scaled independent and dependent variables. In addition treatment of missing values and outliers were carried out. For this study, missing value was treated by replacing it with mean value and this is considered appropriate as the number of data with missing value is less than five percent (Hair et al., 2010). In addition, histogram, box plots and standardized z score were utilized to identif y the univariate outliers. The Mahalanobis distance test was employed to identify the multivariate outliers.

3.11.2 Assessing the Measurement Model (Outer Model)

In this study, only the reflective type of measurement model was measured. Examination of PLS-SEM estimates used to evaluate the reliability and validity of the construct measures. The reflective mode has arrow pointing from the construct to the observed indicator in the measurement model and if the construct changes, all items in the measurement model change too. Hence, all indicators are highly correlated. Table 3.9 describes the evaluations that should be conducted to establish the reliability and validity of the constructs.

Table 3.10
Assessing Reflective Measurement Model

Criterion	Description
Composite reliability/ Internal Consistency	Composite Reliability (CR) should be higher than 0.7.
Convergent validity (Average variance extracted)	Average Variance Extracted (AVE) should be higher than 0.5
Indicator reliability	Indicator loadings should be higher than 0.5
Discriminant validity	AVE of each latent construct should be higher than the construct's highest squared correlation with any other latent construct (Fornell-Larcker criterion).
Cross loadings	Cross loadings provide another way to check for discriminant validity. If an indicator has higher correlation with another latent variable, the appropriateness of the model should be reconsidered.

3.11.3 Assessing the Structural Model (Inner Model)

A reliable and valid outer model estimates permit an evaluation of inner path model estimates or structural model. The results of the structural model enable the researcher to determine how well the empirical data support and confirm the theory (Hair et al., 2010). Table 3.10 presented the criteria for the structural model assessment.

Table 3.11
Structural Model Assessment

Criterion	Description
Significance for path coefficient	Path coefficient or the estimates obtained for the structural model relationship should have standardized values between -1 and +1. Path coefficient close to +1 represents strong positive relationship (and vice versa foe negative values) and usually significant. Path coefficients close to 0 are usually non-significant.
Coefficient of determination (Level of R^2 values)	R^2 value ranges from 0 – 1 with higher levels indicate higher level of predictive accuracy. R^2 values of 0.75, 0.50 or 0.25 reflect substantial, moderate or weak.
Coefficient of determination (Level of R^2 values)	R^2 value ranges from 0 – 1 with higher levels indicate higher level of predictive accuracy. R^2 values of 0.75, 0.50 or 0.25 reflect substantial, moderate or weak.
The f^2 effect size	Effect size (f^2) is the change in R^2 value when specified exogeneous construct is omitted from the model. It is used evaluate whether the omitted construct has a substantive impact on the endogenous constructs. f^2 values of 0.02, 0.15 or 0.35 can be viewed as whether a predictor latent variable has a weak, medium or large effect (Cohen, 1988).
Predictive Relevance (Q^2 or q^2)	The Q^2 value is obtained by using blindfolding procedure. It is only applied to endogenous constructs that have a reflective measurement model specification as well as to endogenous single-item construct. Q^2 values larger than 0 suggest that the model has predictive relevance for a certain endogenous construct.

3.12 Summary

This chapter has presented the conceptual framework of the study and formulated the hypotheses that were tested. The discussion on research design, sampling method and procedures that were utilized in this study has also been included in this

chapter. The survey instruments used in this study are also discussed. Finally, statistical analyses that were used to analyze the data collected and test the hypotheses are elaborated as well. In the next chapter, the results of the present study are presented by focusing on the hypotheses testing.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the data analyses and findings of the study. The discussions of the results are divided into three main sections. The first section discusses the analysis undertaken including discussions on the response rate and the preparation of data for further analysis and the analysis of demographic information. The results of the descriptive statistics are also presented in the first section. The second section discusses the goodness of measures for variables involved in this study and the measurement model validity. Finally, discussions on the validation of the structural model and the results of hypotheses testing are presented in the final section.

4.2 Response Rate

For this study a total of 500 questionnaires were distributed to individual researchers identified as respondents for this study. A total of 204 questionnaires were obtained hence, giving the response rate of 40.8 percent for the study. After rejecting three questionnaires as a result of incomplete data, a total of 201 usable questionnaires

were deemed usable in this study. Data from these 201 questionnaires were later coded and analyzed. Table 4.1 summarized the distribution of questionnaires in this study.

Table 4.1
Questionnaire Distribution

Response Rate	
Questionnaire Distributed	500
Returned and Usable	201
Returned and Unusable	3
Not Returned	296
Response Rate	40.8%
Usable Response Rate	**40.2%**

When using PLS path modelling to test and develop complex model, power analysis is utilized to validate the implications of sample sizes (Akter, D'Ambra & Pradeep, 2011). Marcoulides and Saunders (2006) stated that sample size is important to improve the overall estimates and reduce standard errors in order to ensure rigor in complex modeling. Cohen (1988) suggested that the general convention is that the power of a statistical test should be at least 0.80. Higher power (> .80) indicates that there is a high degree of probability of producing significant results when the relationship is truly significant (Akter et al., 2011). In the path analysis procedure, the number of paths leading to the endogenous construct with the most paths was calculated to come up with the number of the minimum sample size. For this study, the statistical power of 95 percent was utilized and to reach the statistical power of 0.95, the recommended sample size was 154 (refer Appendix D) for the calculation

of the suggested sample size). Hence, the sample size (n=201) used in this study is considered sufficient to achieve an adequate level of statistical power in PLS since it is above the minimum requirement as suggested by the test.

4.3 Preparing the Data

The data was screened before further analysis was conducted. As suggested by Tabachnick and Fidell (2007), this procedure is essential to ensure the accuracy of the data. This was done by checking the computerized data input against the original data. This process involved detecting missing data, checking the accuracy of data input, dealing with univariate and multivariate outliers, and finally examining normality, linearity and homoscedasticity of the data.

4.3.1 Missing Data

Missing data refers to the unavailability of the information for analysis (Hair et al., 2010). Missing data process refers to any systematic event external to the respondent that leads to missing data due to errors in data entry or problems in data collection (Hair et al., 2010). Sometimes, missing data can also be caused by the respondent action for example refusal to answer. Descriptive statistic was used as a tool to detect the missing data. Three cases of missing data were identified. As suggested by Tabachnick and Fidell (2007), all three cases were omitted to avoid the presence of non-random pattern in the analysis. Respondents' own involvement in research, their understanding of the importance of providing accurate data and high level of education background could perhaps be the reasons why there is only a small number

of missing data cases identified. Moreover, the remaining data was considered sufficient to be used for further analysis. There was a total of 137 out of 19,698 data points (0.70%) randomly missing values. This is considered as a small percentage of randomly missing values and hence, the data could be used for further analysis.

4.4 Profile of Respondents

Using descriptive analysis, the demographic information was analyzed. Information about the respondents' age, gender, academic qualification, current position and work experience were obtained in this study. The sample consists of 57.2 percent male and 42.8 percent female. A total of 11.9 percent of the respondents were below the age of 26 while 47.3 percent were between the ages of 26 to 35. Hence, this makes it the largest group that responded to this study. There were a total of 26.4 percent of respondents between 36 to 45 years of age while only 14.4 percent were above 45 years old. As for the positions held by the respondents, the majority of respondents currently worked as researchers or research staff with private companies (44.3%), 34.3 percent currently hold research positions with government agencies and 21.4 percent of the respondents are attached to higher learning institutions. In terms of academic qualifications, almost all of the respondents possessed at least a diploma in their area of expertise. It can be explained that one of the requirements to involve in R & D in Malaysia is to possess at least a diploma level qualification and in this study 25.9 percent of respondents were diploma holders. The majority of respondents that encompass 37.8 percent were degree holders, 18.4 percent held a master's degree and 17.9 percent of the respondents were PhD holders. Job tenure or the length of time an employee has held a job in the organization is another demographic

aspect that was analyzed in this study. A large majority of respondents have less than five years of job tenure. It was reported that 19.4 percent of the respondents reported to have between five and 15 years of job tenure. Only 4.5 percent and 0.5 percent reported to have between 16 and 25 years and above 25 years of job tenure respectively. When responding to the questions on how long they have served the organization, 56.2 percent responded that they have worked with their organizations less than five years. A remarkable proportion of respondents belonged to this category. Another 29.4 percent of respondents reported that they have between five and fifteen years of the organizational tenure. In this study, 12.4 percent of respondents reported that they have served the organizations between 16 and 24 years while the remaining respondents (2.0%) reported that the have served their organizations for more than 25 years. As for their experience in R & D, a remarkable number of respondents (56.2%) reported that they have less than five years of experience, 28.4 percent and 12.4 percents reported that they have between five and 15 years and 16 and 24 years of experience respectively. Only three percent of respondents have above 25 years of R & D experience. Table 4.1 summarizes the descriptive statistic results of the demographic information.

Table 4.2
Profile of the Respondents

Demographic Factors	Categories	Frequency	Percentage
Gender	Male	115	57.2 %
	Female	86	42.8%
Age	Below 25 years old	24	11.9%
	Between 26-35	95	47.3%
	Between 36-45	53	26.4%
	Above 45 years old	29	14.4%
Position	Academic/Researcher with Higher Learning Institution	43	21.4%
	Researcher/Research staff with Government Agencies	69	34.3%
	Researcher/Research staff with Private Company	89	44.3%
Academic qualification	Diploma	52	25.9%
	Bachelor degree	76	37.8%
	Masters	37	18.4%
	PhD	36	17.9%
Job tenure	Below 5 years	152	75.6%
	5– 15 years	39	19.4%
	16 –25 years	9	4.5%
	Above 25 years	1	0.5%
Organizational Tenure	Below 5 years	113	56.2%
	5–15 years	59	29.4%
	16–24years	25	12.4%
	Above 25 years	4	2.0%
Experience in R & D	Below five years	113	56.2%
	5–15 years	59	28.4%
	16–24years	25	12.4%
	Above 25 years	4	3.0%
Recognition/Patent/Award	Yes	61	30.3%
	No	140	69.7%

4.5 Response Bias

4.5.1 Non Response Bias

In this study, the test for non-response bias could not be conducted given the way the data was collected. Data was collected using the self-administered method. Questionnaires were delivered by hand to the respondents and the respondents were given maximum of one week to complete the questionnaire. Due to the method utilized in this study, the test for deviations between the respondents and non-respondents could not be employed as all questionnaires were returned within the predetermined time.

4.5.2 Common Method Variance (CMV)

Common method variance (CMV) refers to the variance attributable to measurement method rather than to the construct of interest (Fiske, 1982; Podsakoff, Mackenzie, Lee & Podsakoff, 2003). CMV is the amount of spurious correlation between variables that is created by using the same method, usually when utilizing a survey to measure each variable. In this research, the same person or source provided the data for both the dependent and independent variables. As suggested by Podsakoff et al. (2003), CMV could be a potential problem when data is obtained from a single source. CMV may affect relationships between variables by inflating or deflating the findings and thus may lead to erroneous conclusions. For this study, appropriate efforts both pre and post remedies, were taken in order to minimize the effects of CMV. Pre remedy for CMV included the utilization of different scale types and

removal of labels indicating the variables being measured in the questionnaire.

After all data have been collected, the post remedy was conducted by employing the test of Harman's single factor. This test was conducted to verify whether a significant amount of CMV still remain in the data. To conduct the test of Harman's single factor, data was analyzed using SPSS. Exploratory factor analysis was performed and using the unrotated factor solution to extract the one criterion from all factors. Then, the reading for the first factor was taken to determine to what extend this factor actually accounted for the variance in the data. Since the first factor does not account for most of the variance (only accounted for 16.04%), it can be concluded that the data was expected to be free of CMV. Refer to Appendix C for the Harman's single factor result.

4.6 Analysis and Results of PLS

In the present study, PLS was utilized to analyze data. PLS-SEM was used for a number of reasons. First, as found by Urbach and Ahleman (2010), one of the advantages is that PLS makes fewer demands regarding the sample size as compared to other method such as AMOS. Furthermore, PLS can be applied to complex structural equation models with large number of constructs and does not require normal-distributed input data. Finally, PLS is especially useful when the main objectives of applying structural modeling are prediction and explanation of a construct (Hair et al., 2014).

PLS is similar to using multiple regression analysis. The main aim is to maximize variance explained in the dependent construct and to evaluate the data quality on the

basis of measurement of model characteristics. For the purpose of this study, the decision to utilize PLS-SEM was made on the conditions that PLS-SEM is more flexible , it makes minimal demands on the sample size and is able to cater to complex structural model that include both the mediating and moderating analyses. Further, it can simultaneously test the structural and the measurement models, hence providing a more complete analysis for the inter-relationships. Therefore, in this study, the SMART PLS M2 Version 2.0 and the two-step analysis approach were utilized in analyzing the data.

Partial least square (PLS) is used to examine the data and provide support for the hypotheses developed for this study. PLS is a causal modeling approach which is aimed to maximize the explained variance of the dependent latent constructs (Hair et al., 2011). As recommended by Anderson and Gerbing (1988) and Henselar, Ringle and Sinkovic (2009), the two-staged approach is utilized in order to perform PLS. The first stage is the assessment of the reliability and validity of the measurement model while the second stage involves the assessment of the structural model.

In the SEM-PLS context, the measurement model refers to the outer model and this path modeling can be categorized into reflective and formative, whereas the selection of outer model is subject to theoretical support (Hair, Ringle, et al., 2011; Henseler et al., 2009). However, in this study, all constructs are identified as reflective models. In the reflective model, the reflective indicators are presented by a single-headed arrow pointing from latent constructs to indicator variables. Each of the constructs in this study is developed based on supporting theories and is under consideration for verification by performing SEM-PLS. The measurement model is

assessed by evaluating the reliability of the individual items and the discriminant validity of the constructs. The analysis and results of the measurement model are presented in the next section.

4.6.1 Goodness of Measure Testing

The goodness of measurement was assessed for the purpose of confirming the validity and reliability of the measurement items. Confirmatory Factor Analysis (CFA) was performed to validate the measurement model by evaluating the relationship between the observed items and their respective underlying constructs. The measurement model includes "the unidirectional predictive relationships between each latent construct and its associated observed indicators" (Hair, et al., 2011). In the SEM-PLS context, the measurement model refers to the outer model and this path modelling can be categorized into reflective and formative, whereas the selection of outer model is subject to theoretical support (Hair, et al., 2011; Henseler et al., 2009). Each of the constructs in this study was developed based on supporting theories and is under consideration for verification by performing SEM-PLS.

Hulland (1999) suggested that in SEM-PLS, the reliability of individual construct is assessed by examining the loadings of the respective items on their respective latent construct. The readings on the loadings were recorded and assessed. High loadings indicated that there is more shared variance between the constructs and it measures while, low loadings reflected little explanatory power of the model. Lower loadings, hence, reduced the estimated parameters that are linked to the constructs (Hulland, 1999).

4.6.2 Assessing Construct Validity and Reliability

According to Henseler et al., (2009), the construct validity or the quality of a latent construct is assessed by evaluating convergent validity and discriminant validity of each construct. The construct validity of a construct is about how well the operational definition of a variable actually reflects the true theoretical meaning of that concept. As stated earlier, the analysis of the convergent and discriminant validity was conducted using Confirmatory Factor Analysis (CFA).

4.6.2.1 Convergent Validity

Convergent validity refers to agreement between measures of the same construct (Guo, Aveyard, Fielding & Sutton, 2008). Convergent validity signifies that a set of indicators represent one and the same underlying construct, and this can be demonstrated through their uni-dimensionality (Henseler et al., 2009). Hair et *al*. (2010) recommended that convergent validity could be assessed by examining the factor loadings, composite reliability (CR) and the average variance extracted (AVE).

Factor loading is one of the indicators used to determine the convergent validity of the construct. Factor loadings of items were examined to ensure that the items truly measure the designated construct (Anderson & Gerbing , 1991; Ahire, Golhar & Waller. 1996). CR is another indicator used to assess the convergent validity. CR explains the degree to which the items consistently represent the same latent construct (Hair et al., 2010). Finally, assessment of the convergent validity can be done through the calculation of the AVE (Fornell & Larcker 1981; Hair et al., 2010).

The results of the examination of the three indicators used to determine convergent validity in this study is presented in Table 4.3. In order to check for the convergent validity, all items' factor loadings were examined. The results showed that the loadings range from 0.706 to 0.931. The factor loadings in this study, hence, satisfactorily exceed the recommended cut off point of 0.70 (Hair et al, 2014). The results indicate that more than 70% of the variance in the observed variable is explained by the constructs. However, any items with loadings of below than 0.70 were deleted.

CR refers to the extent to which the items consistently represent the same latent construct (Hair et al, 2014). Although Cronbach's alpha is regarded as an important measures of internal consistencies, in this study CR is employed. The main limitation of using Cronbach's alpha is that it assumes the equal reliabilities of all items. In addition, Cronbach's alpha tends to underestimate the internal consistency reliability of latent variables (Hair et al, 2014). To overcome some of the limitations, Anderson and Gerbing (1988) suggested the utilization of CR. CR uses the items loadings obatained within the nomological network; hence, offers a better estimate of variance shared by the respective indicators (Hair et al, 2014). Table 4.1 shows the CR values obtained from the study. The CR values ranged from 0.844 to 0.939. These values are higher than the acceptable threshold for CR which is 0.7 (Hair et al, 2011; Henselar et al, 2009).

Finally, the AVE was calculated in order to determine the convergent validity. AVE refers to the degree to which a latent construct explains the variance of its items (Hair et al, 2014). As suggested by Fornell & Larcker (1981) AVE is a criterion for

convergent validity. According to Hair et al. (2014) and Henselar et al. (2009), an AVE value that is greater than 0.50 indicates that a latent variable is able to explain more than half of the variance of its indicators. Table 4.3 shows the ranges of the AVE calculated for latent constructs in this study ranges from 0.572 to 0.861. These values were considered higher than the suggested cut off point of 0.50 for AVE (Hair et al, 2006).

The results of the examination of the three indicators (factor loadings, AVE and CR) used to determine the convergent validity in this study showed that all indicators met the requirement to sufficiently establish the convergent validity of the constructs in this study. Hence, the validity and reliability of the constructs were partially established. Further analysis on the discriminant validity was conducted to fully complete the assessment of the validity and reliability of the constructs.

4.6.2.2. Discriminant Validity

Discriminant validity is another indicator yet to be observed in order to determine the construct validity. Discriminant validity refers to the extent the construct does not correlate with other measures that are different from it (Hair, 2007). Discriminant validity can be defined as a situation when two or more distinctively different concepts are not correlated to one another (Sekaran & Bougie, 2011). Therefore, discriminant validity concerns the distinctiveness of different construct (Campbell & Fisk, 1959; Guo et al., 2008). As suggested by Chin (2010) and Hair et al. (2011), the two methods that have been put forward to determine the constructs' discriminant validity are: 1) the cross loadings and 2) the Fornell-Larcker criterion.

PLS-algorithm analysis was run to obtain the loadings and cross loadings of constructs employed in this study. The values of the loadings and the cross loadings were later examined. Discriminant validity was established when an indicator's loading pertaining to its associated latent construct was higher than all the remaining constructs. Hair et al. (2011) recommended that indicators with very low loading of 0.4 should always be eliminated from further consideration. In addition, the square root of the AVE value was calculated to fulfil the Fornell-Larcker criterion. Substantiation of the discriminant validity occurs when the square root of the AVE value for a construct should be greater than the average variance shared between the construct and the other constructs (Compeau, Higgins & Huff, 1999). Table 4.4 presents the results of the loadings and the cross loadings and Table 4.5 shows the value of the square root of the AVE (Fornell-Larcker criterion) of each construct. The results of these analyses help established the discriminant validity.

The goodness of measurement was assessed in this study for the purpose of confirming the validity and reliability of the measurement items. Through CFA, the measurement model was validated. The convergent and discriminant validity were ascertained through various indicators such as the assessment of loadings and cross loadings, AVE and CR values as well as the square root of the AVE value. These results proved that all main constructs in this study that were autonomy, creative behaviour, culture, job involvement, supervisory styles, work motivation and stressor and reward are all valid measures. They are valid measures of their respective constructs based on their parameter estimates and statistical significance. This is reflected by the results of the data analysis for the convergent validity and discriminant validity as presented in Figure 4.1 and Tables 4.2, 4.3, and 4.4.

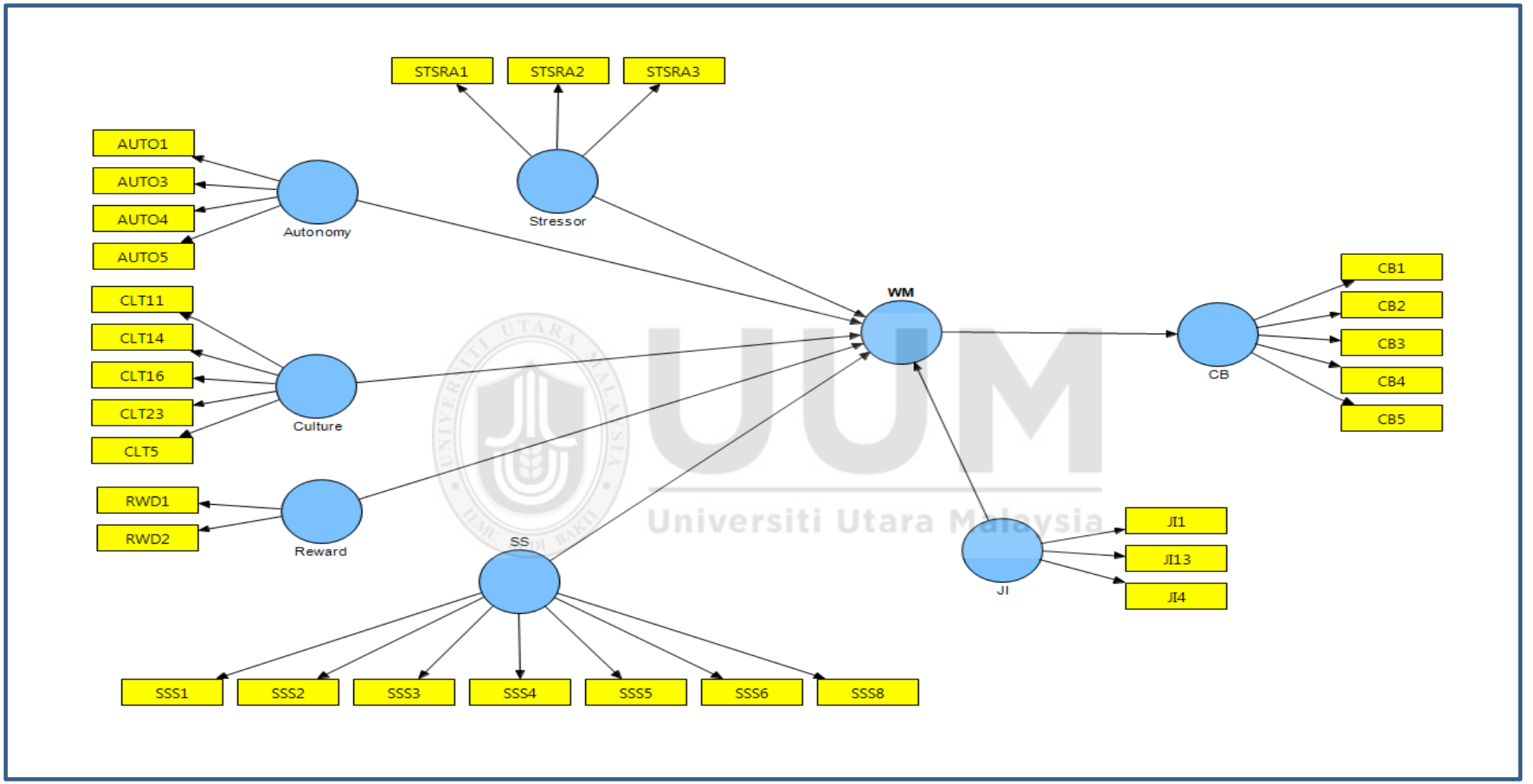

Figure 4.1
Measurement Model

Table 4.3
Measurement Model

CONSTRUCT	**ITEM**	**LOADING**	**AVE**	**CR**
AUTONOMY	AUTO1	0.75	0.61	0.86
	AUTO3	0.76		
	AUTO4	0.78		
	AUTO5	0.82		
CREATIVE BEHAVIOR	CB1	0.86	0.68	0.91
	CB2	0.83		
	CB3	0.79		
	CB4	0.84		
	CB5	0.80		
CULTURE	CLT11	0.81	0.58	0.87
	CLT14	0.80		
	CLT16	0.74		
	CLT23	0.73		
	CLT5	0.72		
JOB INVOLVEMENT	JI1	0.73	0.59	0.81
	JI13	0.78		
	JI4	0.79		
REWARD	RWD1	0.93	0.86	0.93
	RWD2	0.93		
SUPERVISORY STYLE	SSS1	0.79	0.69	0.94
	SSS2	0.91		
	SSS3	0.85		
	SSS4	0.84		
	SSS5	0.83		
	SSS6	0.77		
	SSS8	0.79		
STRESSOR ROLE	STSRA1	0.71	0.64	0.84
	STSRA2	0.88		
	STSRA3	0.81		
WORK MOTIVATION	WMIN13	0.73	0.57	0.87
	WMIN26	0.77		
	WMIN27	0.77		
	WMIN28	0.80		
	WMIN5	0.71		
	WMIN13	0.73		
	WMIN26	0.77		

Table 4.4
Loadings and cross-loadings

	Auto	CB	Culture	JI	Reward	SS	Stressor	WM
AUTO1	**0.75**	0.38	0.38	0.29	0.28	0.38	-0.05	0.21
AUTO3	**0.76**	0.24	0.38	0.23	0.20	0.42	-0.12	0.25
AUTO4	**0.78**	0.31	0.32	0.31	0.21	0.37	0.01	0.40
AUTO5	**0.82**	0.33	0.31	0.36	0.27	0.40	-0.00	0.38
CB1	0.30	**0.86**	0.28	0.27	0.16	0.19	0.08	0.41
CB2	0.26	**0.83**	0.21	0.15	0.15	0.17	0.07	0.39
CB3	0.27	**0.79**	0.06	0.27	0.21	0.14	0.15	0.38
CB4	0.36	**0.84**	0.24	0.30	0.23	0.16	0.02	0.42
CB5	0.44	**0.80**	0.30	0.28	0.20	0.25	-0.01	0.42
CLT11	0.29	0.20	**0.81**	0.08	0.27	0.46	-0.03	0.23
CLT14	0.32	0.19	**0.80**	0.11	0.27	0.48	-0.03	0.26
CLT16	0.40	0.19	**0.75**	0.16	0.29	0.51	-0.06	0.10
CLT23	0.38	0.21	**0.73**	0.16	0.26	0.40	-0.09	0.22
CLT5	0.30	0.24	**0.72**	0.16	0.27	0.44	0.10	0.17
JI1	0.43	0.27	0.30	**0.73**	0.08	0.33	-0.03	0.19
JI13	0.18	0.20	0.05	**0.78**	0.07	0.05	0.10	0.17
JI4	0.28	0.23	0.04	**0.79**	0.09	0.02	-0.08	0.21
RWD1	0.31	0.26	0.30	0.07	**0.93**	0.35	0.02	0.15
RWD2	0.25	0.16	0.37	0.12	**0.93**	0.27	0.05	0.15
SSS1	0.33	0.11	0.42	0.01	0.33	**0.79**	0.02	0.10
SSS2	0.48	0.18	0.59	0.13	0.30	**0.91**	-0.10	0.2
SSS3	0.39	0.20	0.52	0.20	0.31	**0.85**	-0.40	0.42
SSS4	0.36	0.14	0.53	0.09	0.31	**0.84**	-0.03	0.07
SSS5	0.43	0.11	0.53	0.17	0.22	**0.83**	-0.13	0.14
SSS6	0.34	0.20	0.40	0.05	0.20	**0.77**	-0.14	0.05
SSS8	0.45	0.28	0.40	0.24	0.27	**0.79**	-0.17	0.18
STSRA1	0.03	0.09	0.03	0.11	-0.02	0.04	**0.71**	0.13
STSRA2	-0.06	0.07	-0.10	-0.03	0.04	-0.15	**0.88**	0.19
STSRA3	-0.05	0.02	0.03	-0.11	0.07	-0.13	**0.81**	0.13
WMIN13	0.26	0.41	0.17	0.17	0.04	0.08	0.16	**0.73**
WMIN26	0.31	0.36	0.13	0.11	0.12	0.17	0.20	**0.77**
WMIN27	0.31	0.32	0.17	0.20	0.19	0.10	0.13	**0.77**
WMIN28	0.34	0.34	0.24	0.15	0.15	0.17	0.14	**0.80**
WMIN5	0.37	0.40	0.32	0.29	0.12	0.19	0.10	**0.71**

Table 4.5
Discriminant Validity (Fornell-Larcker Criterion)

	Autonomy	CB	Culture	JI	Reward	SS	Stressor	WM
Autonomy	**0.78**							
CB	0.40	**0.83**						
Culture	0.43	0.27	**0.76**					
JI	0.39	0.31	0.17	**0.77**				
Reward	0.30	0.23	0.36	0.10	**0.93**			
SS	0.50	0.22	0.60	0.18	0.34	**0.83**		
Stressor	-0.04	0.08	-0.03	-0.01	0.04	-0.11	**0.80**	
WM	0.42	0.49	0.28	0.25	0.16	0.19	0.19	**0.76**

4.7 Level of Creative Behavior

To examine the level of creative behavior, descriptive analysis was carried out in SPSS. Table 4.4 shows the result of the mean of creative behavior (CB) in this study. This result helps to establish the level of creative behavior as perceived by the respondents of this study. The respondents, who are Malaysian researchers perceived that they have displayed considerable degree of creative behavior when performing their tasks at work (M = 3.806).

Table 4.6
Descriptive Statistics for the Studied Variables

Variable	Mean	Scale
CB	3.806	1= Strongly Disagree, 5= Strongly Agree

4.8 Assessment of PLS-SEM Structural Model (Testing for Hypotheses)

For hypotheses testing, the path analysis was used to verify all hypotheses generated in chapter three. The analysis of the inner model is conducted at this stage. PLS is considered as a prediction oriented and variance-based approach, which is relevant for prediction of hypothesized relationship and theory building (Gefen, Straub & Boudreau, 2000; Hammedi, van Riel & Sasovova, 2011). By running PLS-SEM algorithm and bootstrapping, the structural model assessment was performed (Chin, 2010). Structural model assessment was performed to test the hypotheses relationships among the variables. This test can be done only after measurement model analysis has passed all the recommended criteria.

In PLS, the software generates estimates of standardized regression coefficients which refer to beta values for model path (Hammedi et al., 2011). The bootstrapping procedures generate the path coefficient (β), the explained variance (R^2) and the effect size (f^2) for each path in the model. Dickey, Kamal, Lundgren, Bailey, Dunmore and Patterson (2007) stated that the standardized betas of the path data coefficient in the structural model should be evaluated in order to test the hypotheses developed in this study.

PLS uses a non-parametric re-sampling procedure known as bootstrapping to evaluate the significance of the parameter estimates (Hayes, 2009; Henseler et al., 2009). The bootstrapping procedure was performed in order to generate the t-values for the model tested (Ulaga & Eggert, 2005). For the purpose of this study, 500 re-sampling procedures for bootstrapping were used. This is consistent with previous

studies in the business-to-business context (Martinez & Pina, 2005; Völckner, Sattler, Hennig-Thurau, & Ringle, 2010) that also utilized the 500 re-sampling procedures.

In this study, as theorized by the underpinning theory of self-determination, the contextual factors (autonomy, culture, supervisory styles, stressor and reward) were hypothesized to affect creative behavior (dependent variable) through the mediation effect of work motivation. Hence, the mediation effect of work motivation on the relationships between the contextual factors and creative behavior would be tested. In addition, this study attempts to test the introduction of a moderator that is job involvement that could possibly enhance the relationships between the contextual factors and work motivation. The discussion on the moderation analysis is presented in the next section of this chapter. Figure 4.3 summarizes the results of the testing for hypotheses in this study that include the mediation analysis and the direct effect of the relationship between work motivation and creative behavior. Figure 4.4 describes the moderation analysis.

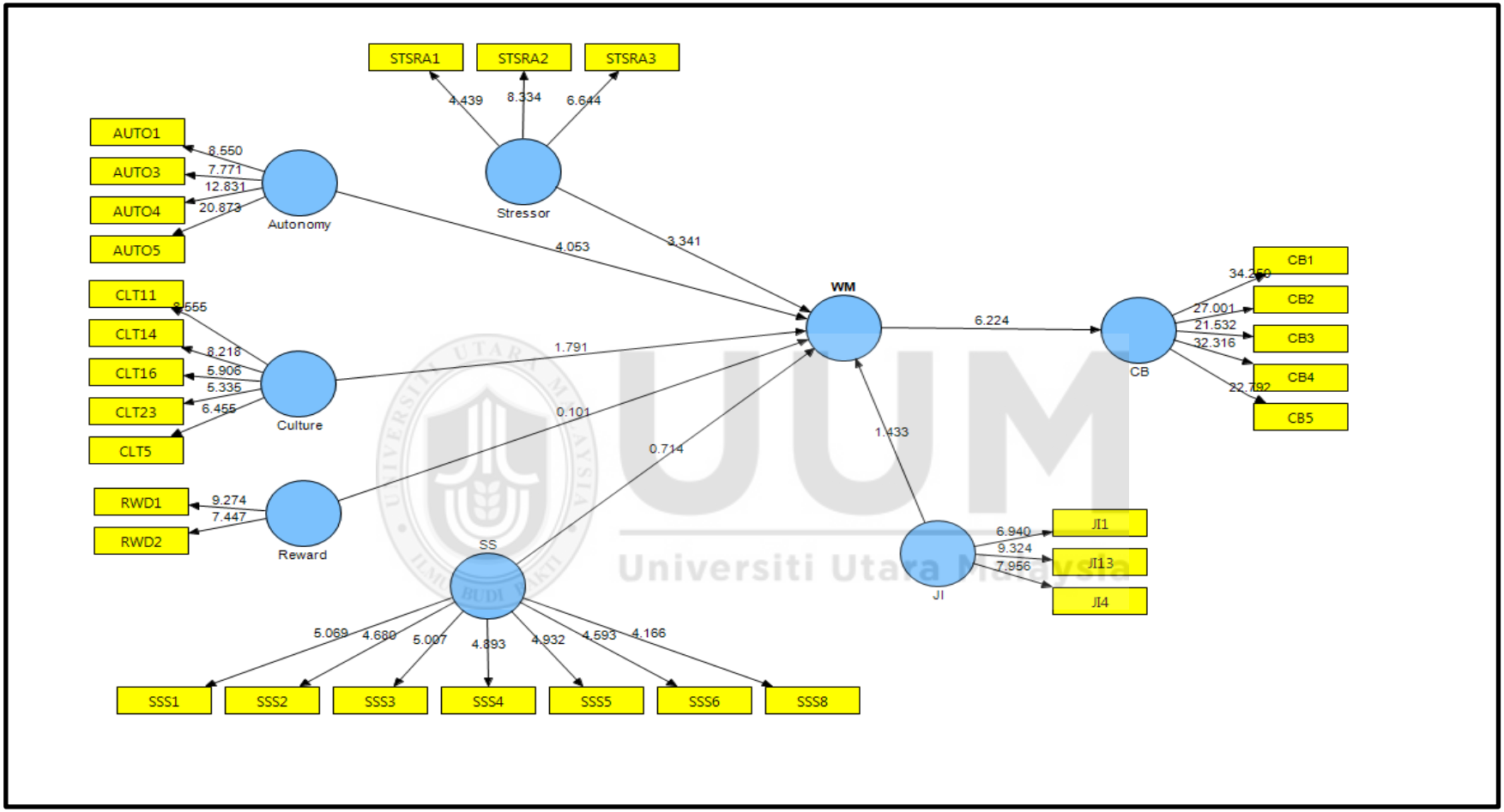

Figure 4.2
Results of Hypotheses Testing (Mediation Analysis and Direct Effect)

4.8.1 Mediation Impact of Work Motivation on the Contextual Factors and Creative Behavior

In this study, the mediation effect of work motivation on the relationships between the contextual factors (namely stressor, autonomy, culture, reward and supervisory style) and creative behavior were tested to answer hypotheses H1 to H5. Based on the argument from the traditional social sciences decisions and claims are made from the test of quantities, the indirect effect is quantified as the products of its constituents paths (Hayes, 2009). A contemporary approach to mediation analysis that is bootstrapping was utilized in this study. Hair et al. (2013) supported the application of bootstrapping for mediation analysis since bootstrapping the sampling distribution of the indirect effects works for simple and multiple mediator models.

Upon completion of the analysis, the indirect effect is estimated and used to generate the confidence interval (CI) of 95%. There are five hypothesized paths of latent variables displayed in this model as depicted by Figure 4.3 above. The study postulated that the five contextual factors influenced work motivation and later on affects creative behavior. Out of the five hypotheses, hypotheses H1 and H2 were supported while the analysis could not support H3, H4 and H5. The mediation results are presented in Table 4. 7. The detail discussion on the mediation analysis was presented below.

Table 4.7
Mediation Results

						Bootstrapped Confidence Interval (Boot CI)		
	Path a	Path b	**Indirect Effect**	SE	***t-value***	**95% LL**	**95% UL**	**Decision**
H1 STS->WM->CB	0.20	0.49	0.10	0.03	2.91**	0.03	0.17	Supported
H2 AUTO->WM->CB	0.36	0.49	0.18	0.06	3.13**	0.07	0.29	Supported
H3 CLT->WM->CB	0.16	0.49	0.08	0.04	1.73*	-0.01	0.16	Not Supported
H4 RWD->WM->CB	0.01	0.49	0.01	0.03	0.10	-0.06	0.07	Not Supported
H5 SS->WM->CB	0.08	0.49	-0.04	0.05	-0.74	-0.15	0.07	Not Supported

*P<0.05 (t=1.645); **P<0.01 (t=1.96)

Hypothesis 1: Work motivation will mediate the relationship between stressors and creative behavior.

The result obtained from the bootstrapping analysis presented in Figure 4.2 and Table 4.5 showed that the indirect effect (beta = 0.099) was significant with a t-value of 2.911. According to Preacher & Hayes (2008), the indirect effect of 95% Boot CI (LL = 0.032; UL = 0.166) did not straddle a 0 in between, indicationg there was a mediation effect of work motivation on the relationship between stressor and creative behavior. Hence, the result supported hypothesis 1 as postulated in this study.

Hypothesis 2: Work motivation will mediate the relationship between autonomy and creative behavior.

The hypothesized indirect effect was demonstrated by the bootstrapping results depicted in Figure 4.2 and Table 4.5. The indirect effect (beta = 0.178) was

significant with a t-value of 3.129. The further assessment on the mediation effect was conducted by examining the 95% Boot CI for LL and UL values. The 95% Boot CI values of LL = 0.067 and UL = 0.290 indicate that there was a mediation effect of work motivation on the relationship between autonomy and creative behavior as the values did not straddle a 0 in between. The result, therefore supported the hypothesized mediation impact of work motivation on the relationship between autonomy and creative behavior.

Hypothesis 3: Work motivation will mediate the relationship between innovation-oriented value culture and creative behavior.

The bootstrapping results presented in Figure 4.2 and Table 4.5 showed that the indirect (beta = 0.076) was significant with t-value of 1.726. However, the mediation effect was not established after the 95% Boot CI values (LL value of -0.010 and UL value of 0.162) were assessed. The values indicated that there was no mediation effect of work motivation on the relationship between innovation-oriented value culture and creative behavior as the values did straddle a 0 in between the values. The result, therefore did not support Hypothesis 3 postulated in this study.

Hypothesis 4: Work motivation will mediate the relationship between rewards and creative behavior.

The results for mediating analysis are presented in Figure 4.2 and Table 4.5. The indirect effect (beta = 0.076) was not significant with a t-value of 0.101. Furthermore, the 95% Boot CI: (LL = -0.063 and UL = 0.070) straddled a 0 in between, hence, this indicated that there was no mediation effect of work motivation

on the relationship between reward and creative behavior.

Hypothesis 5: Work motivation will mediate the relationship between Supportive style and creative behavior.

Results from bootstrapping analysis showed that the indirect effect (beta = -0.040) was not significant with a t-value of –0.735. Furthermore, the 95% Boot CI: (LL = -0.146 and UL = 0.066) did straddle a 0 in between indicating that there was no mediation effect of work motivation on the relationship between supervisory style and creative behavior.

Hypothesis 6: Work motivation is positively associated with creative behavior.

Table 4.8
Summary of the Direct Effect

Hypothesis	Relationship	Beta	SE	T Statistic	Decision
H6	WM → CB	**0.488**	**0.0803**	**6.0823****	Supported

Table 4.6 presents the result of the direct effect hypothesized in this study. The result from the output of the algorithm and bootstrapping PLS-SEM confirmed that there is a positively significant relationships between work motivation and creative behavior ($\beta = 0.488$, $t = 6.0823$, $p<0.01$). Therefore, Hypothesis 6 is supported. From R^2, it was further found that 24.0% of the variance in creative behavior is explained by work motivation. Hence, it can be concluded that the effect of work motivation is substantial enough.

4.9 Moderating Effect of Job Involvement on the Contextual Factors and Work Motivation

The next analysis is the moderating analysis. A moderator refers to a contingent variable that changes the relationship between two other variables in a way that the nature of the impact of the predictor on the criterion varies according to the level of the contingent or moderating variable (Holmbeck, 1997). In this study the moderator introduced was job involvement. The moderating analysis was performed to examine the moderating impact of job involvement on the relationships between the contextual factors and work motivation. In examining the interaction effects of the moderator using PLS, a direct moderating test using product approach is applicable (Hair et al., 2013). Results of the moderating effect were presented in Figure 4.3 and Table 4.6 below.

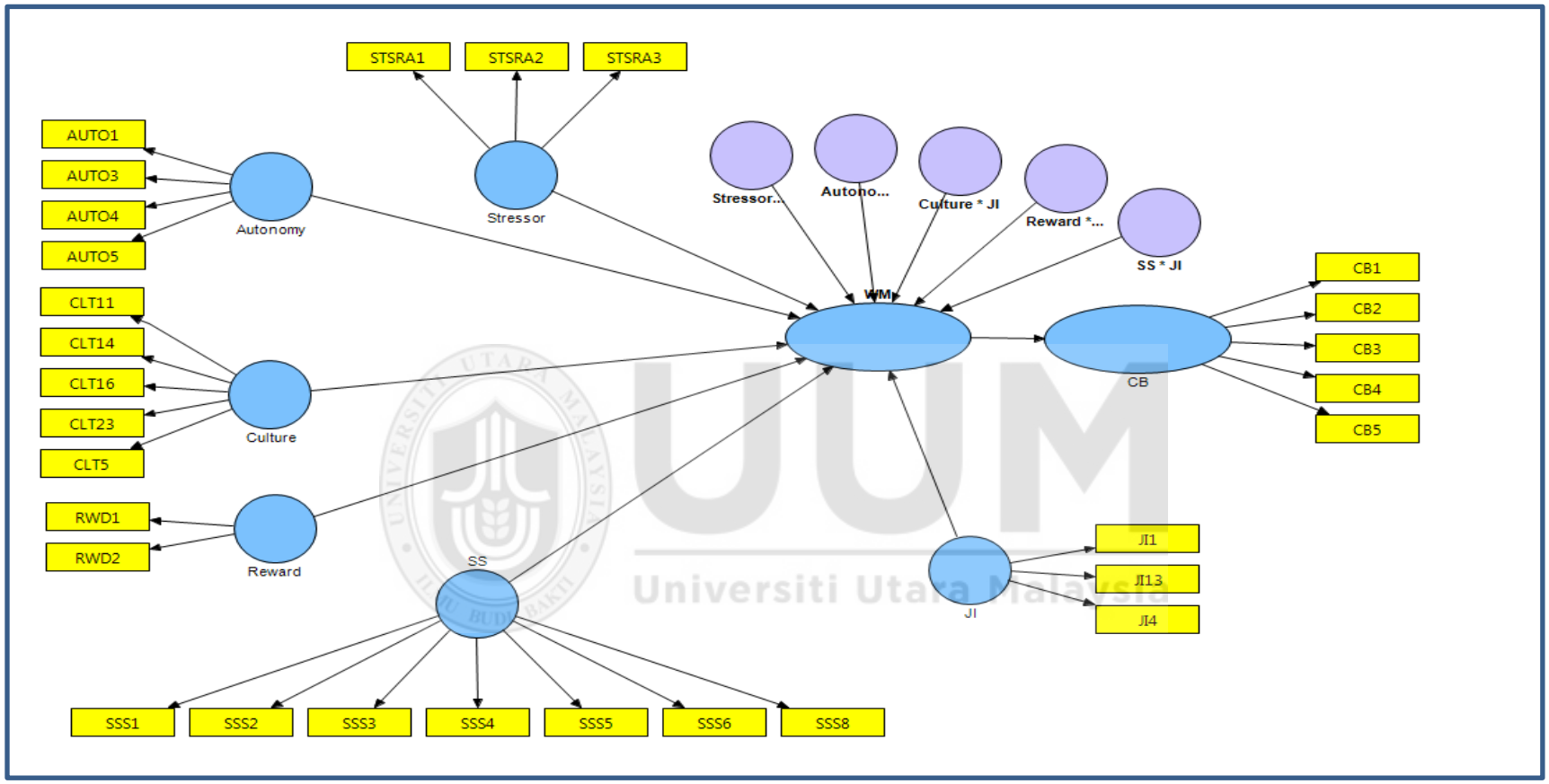

Figure 4.3
The Moderator Analysis

Table 4.9
Summary of results for moderating effect

Hypotheses	Relationship	Std Beta	SE	t-value	Decision
H7a	**STS * JI -> WM**	**-0.265**	**0.144**	**1.841***	Supported
H7b	**AUTO * JI -> WM**	**0.079**	**0.116**	**0.682**	Not supported
H7c	**CLT * JI -> WM**	**-0.114**	**0.111**	**1.033**	Not supported
H7d	**RWD * JI -> WM**	**0.091**	**0.088**	**1.037**	Not supported
H7e	**SS * JI -> WM**	**-0.227**	**0.119**	**1.911***	Supported

*P<0.05 (t=1.645); **P<0.01 (t=1.96)

The results presented in Figure 4.3 and Table 4.6 indicated that out of the five interactions hypothesized in this study, two were supported. There was a moderating effect of job involvement (JI) in the relationship between stressor (STS) and work motivation (WM) with the results of β = -0.265, t= 1.841, p<0.05 . Again, the interaction between STS*JI is negative therefore the positive relationship between STS and WM would be enhanced when job involvement is low. The interaction plot in figure 4.4 showed the line labelled Low JI has a steeper gradient compared to the line labelled High JI. This indicated that the positive relationship is indeed stronger when JI is low.

Another finding was on the moderating effect of job involvement (JI) in the relationship between supportive supervisor style (SS) and work motivation (WM) (β = -0.227 , t= 1.911, p<0.05). The interaction between SS*JI is negative. Hence, it can be said that the positive relationship between SS and WM would be stronger when the

researcher is less involved with his or her job. Figure 4.5 showed the line labelled High JI has a steeper gradient compared to the Low JI. This indicated that the positive relationship between SS and WM is indeed stronger when JI is high. Hence, hypothesis 7e is supported.

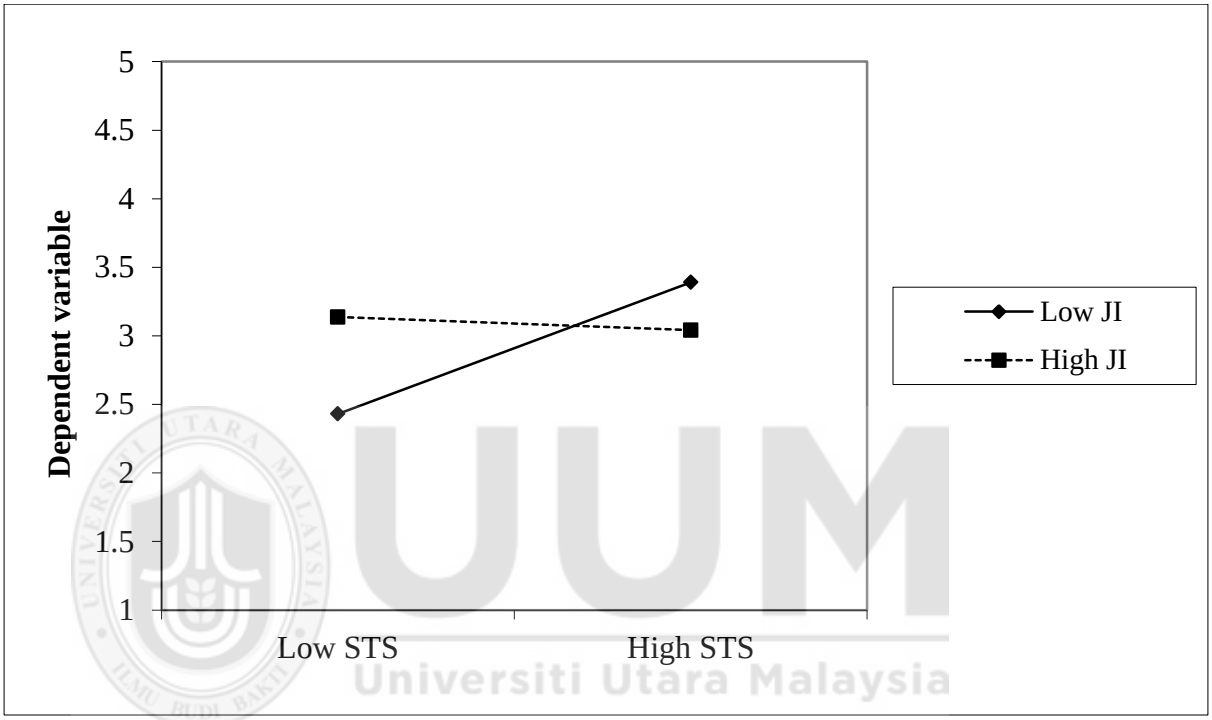

Figure 4.4:
*Moderating effect STS*JI→WM*

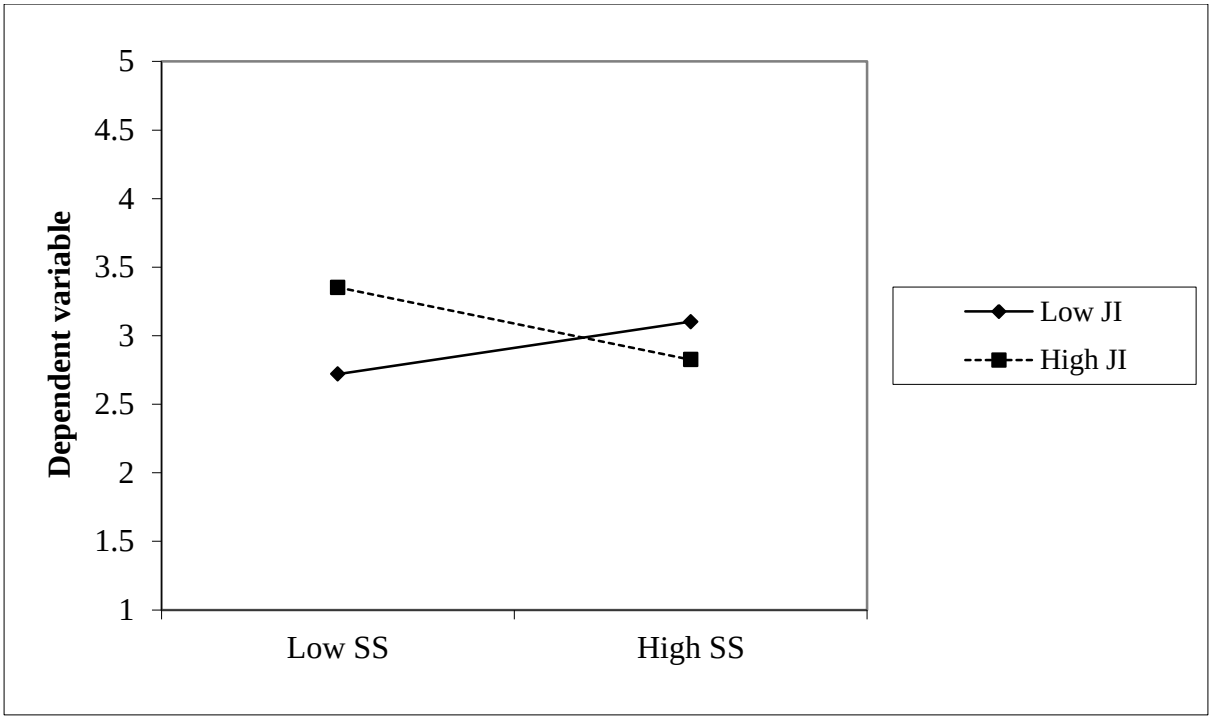

Figure 4.5:
*Moderating effect SS*JI→WM*

4.10 Analyzing Predictive Relevance (Q^2)

Chin (2010) and Henseler et al. (2009) recommended that the predictive relevance (Q^2) was calculated in order to assess the capability of the research model to make prediction. The Q-squares statistics measure the predictive relevance of the model by reproducing the observed values by the model itself and its parameter estimates. To evaluate the criterion of predictive accuracy, the Stone-Geisser's Q^2 value was utilized. The blindfolding procedure was performed to obtain the value of Q^2 and this procedure is only performed if the endogenous latent variables that hold a reflective measurement model specification. As recommended by Fornell and Cha (1994) and Hair et al. (2014), the assessment of the Q^2 value should be interpreted in this way: Q^2 greater than 0 implies than the model has predictive relevance, while value less than 0 indicates lack of predictive relevance. In addition, Hair et al. (2014)

suggested that the values of 0.02, 0.15, and 0.35 indicate that an exogenous construct has a small, medium, and large predictive relevance for a certain endogenous construct respectively. In this study, the two reflective endogeneous variables were creative behavior and work motivation, hence the Q^2 values for both constructs were calculated. The results of the predictive relevance are presented in Table 4.9.

Table 4.10
Predictive relevance for endogenous variables

Constructs	**Q^2**	**Result of Predictive Relevance**
Creative Behavior	0.154	Yes
Work Motivation	0.198	Yes

4.11 Summary of the Findings

This chapter reports the findings of the data analysis. The analyses were carried out using SPSS for frequencies to describe profile of the respondents, and PLS-SEM was then used to test the measurement and structural model. Finally, the results of hypotheses testing were reviewed. The following chapter will recap the findings, discusses the implications, limitation, and suggestions for future research and conclusion.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Introduction

The final chapter of the thesis discusses the research findings, discussion and conclusion of the study. The discussion is organized into four sections based on the research questions of the study. The first section discusses the influence of work motivation on creative behavior. The second section explains the moderating effect of work motivation on the relationships between contextual factors (stressor, autonomy, culture (IOVC), reward and supervisory style) and creative behavior. Then, the discussion on the moderating effect of job involvement on the relationships between the contextual factors and work motivation is presented in the third section. The chapter ends by providing theoretical and practical implications, as well as limitations of the study and recommendations for future research.

5.2 Recapitulation of the Study Findings

Firstly, in this study, it was found that the level of creative behavior among the researchers was high (Mean = 3.806). Second, the study also examined the relationships between the contextual factors work motivation and creative behavior. Out of five hypothesized relationships, two hypotheses were supported. The

relationship between stressors, work motivation and creative behavior was supported and the relationship between autonomy, work motivation and creative behavior was also supported in this study. These relationships were significant at the confidence interval of 99%.

Thirdly, in this research, the indirect relations between the independent variables mediating variable when moderating variable was incorporated in the relationships, found that out of the five hypotheses proposed, the findings supported two of the hypotheses. The relationship between stressor and work motivation and moderated by job involvement was supported. In addition, the relationship between supervisory style and work motivation and moderated by job involvement was also supported in this study. These relationships were significant at the confidence interval of 95%.

5.3 Discussion

The following sections discuss the findings of the study. It begins with a discussion of the result on the level of creative behavior. The next section elaborates the findings on the indirect relationships between the contextual factors, work motivation and creative behavior. Then, the discussion on the moderating effect of job involvement is presented and discussed in the final section.

5.3.1 The Relationship between Stressors, Work Motivation and Creative Behavior

Stressors were posited to be related to work motivation and creative behavior. The result of this study showed that the proposed link was significant and negatively related. The finding in this current study is consistent with that of Wincent and Ortqvist (2011) who studied new businesses in Sweden and also Cekmecelioglu and Gunsel (2011), who studied creative performance among employees in Turkey.

In accord with the stressor-strain perspective that emphasized on the negative effects of stressors, the result indicated that stressors were found to negatively influence individual outcomes such as low motivation and decrease in task performance such as creative behavior. Stressors, being undesirable and displeasing experiences usually triggered by factors in the environment, external stimulus or an event particularly at the workplace that might be harmful to an individual well-being (Beehr et al., 2000; Coelho, Augusto & Leges, 2011). Human beings were conceived as having limited pool of cognitive resources (Baron, 1986). When they utilized some of these resources to attend to certain factors or events such as stressors, this will leave fewer cognitive resources available to attend to more important tasks such as performing the job and engaging in creative processes. Under this situation, people will usually resort to engaging in simpler cognitive strategies, looking for easier alternatives, and refusing to go beyond the routine problem solving approach that could all undermine creativity (Byron, Kazanchi &

Nazarian, 2010). This explains the negative effect of stressors known as hindrance stressors to creative behavior.

Apart from support from the literature, the contextual background of the study may become one plausible explanation of the finding for this study. Relatively, a large percentage of the respondents (56.2%) have less than five years of experience in research and development area. Generally, in Malaysia, researchers or R and D personnel could be grouped into two: academic and non-academic. Pursuing a career as a researcher in both academic and non-academic worlds is considered very challenging and highly demanding especially for the early career researchers. For academic researchers, their job scope usually involves lab or research work, teaching, finding financial support and supervising students. Apart from that, they are also expected to achieve their publication and consultation targets as well as a vast amount of documentation to be completed. For some researchers, they are also involved in some administrative work which also consumes a lot of their resources. The psychological perspective of human being could be utilized to help explain this situation. It is considered inherent human ability to constantly monitor and consistently engage in cognitive evaluation of the situation in order to understand his or her reactions both emotionally and psychologically towards the situation (Lazarus, 1991; Perrewe et al., 2004). It can be argued that if the demand created by the environment or situation deemed as threatening or exceeding the person's resources, stress will be produced. Stressors, as theorized earlier would have deterring effect on the researchers' motivation and later obstruct their ability to perform their work creatively.

Furthermore, a large majority of the respondents in this study belongs to the age group of below 35 years old (59.2%). At this age, people are usually struggling to juggle between establishing one's career and fulfilling one's personal goals. These young researchers involve themselves in many endeavors that range from pursuing a higher degree, presumably a master's or a doctorate degree, achieving target and meet the expectations at work as well as settling down and raising young children. According to role theory, a person who is experiencing conflict because of the demand to fulfill multiple roles and expectations will result in an undesirable state. Role theory also proposes that multiple roles lead to personal conflict (interrole) as it becomes more difficult to perform each role successfully, due to conflicting demands on time, lack of energy, or incompatible behaviors among roles (Beutell & Greenhaus, 1986; Grandey & Cropanzano, 1999; Kahn et al., 1964). A study by Martins, Eddleston and Veiga (2002) confirmed that younger employees (up to 32 years of age) experienced intense work-family conflict and this was significantly and negatively related to personal outcomes and performance. Hence, this is consistent with the finding of this study that stressors were significantly and negatively related to work motivation and creative behavior.

5.3.2 The Level of Creative Behavior

Creative behavior has been viewed as the creative act, or a set of acts, which is made explicit through behavior (Cabra & Uribe-Larach, 2013). Creative behavior is not submissive; it is action that leads to a creative output or a solution to a challenge. Creative behavior is not confined solely to the domain of cognition and thought but rather it is action that yields output that is deemed original and useful (Puccio &

Cabra, 2011). It is a behavior that permits one to act unobstructed from self or externally imposed constraints in pursuit of self-expression, invention, discovery, design, and problem solving (Sarooghi, Libaers & Burkemper, 2015).

The level of creative behavior was indicated by the calculation of the mean of responses obtained for items measuring creative behavior. In this study, the level of creative behavior among Malaysian researchers was high with the mean of 3.806. Comparing the findings in this study with findings from previous studies, it can be concluded that in many research that focused on creative behavior, majority of the findings showed that the levels of creative behavior assessed were either high or moderately high. For the purpose of making comparison, a high level of creative behavior with the mean of 3.97 out of 5 point was obtained in the study by Tierney and Farmer (2002) and a moderately high level of creative behavior (mean of 4.09 out of 7 point scale) were found in a study by Hirst, Van Knippenberg and Zhou (2009). By looking at the result obtained by this study, it can be concluded that the level of creative behavior among Malaysian researchers was relatively high and consistent with the findings from previous studies.

Creative behavior is the result of the interaction between a creative person and his or her contextual situation. Apart from the contextual factors, understanding the people who are involved in the creative process could possibly provide better explanation of the outcome variable. The respondents in this study were researchers and R and D employees. Therefore, a careful examination of certain traits and personal characteristics of the person could possibly provide an explanation to support this finding. Throughout the literature in creativity, people who are involved in scientific

based activities are referred to as scientifically creative people. Generally, people who are scientifically creative are highly motivated, confident, committed and have keen sense of direction (Kapur, Subramanyam & Shah, 1970). Moreover, the measurement used to measure creative behavior was the self-reported five items adopted from Zhou (2000). Apart from the personality traits, researchers are usually well trained in their area of expertise with knowledge, skills and exposure sufficient to meet the requirement to perform creatively at work. Presumably, researchers who are self-directed, highly confident and capable of perform their job will rate their performance as high when responding to general statements about their behavior that results in identifying original and better ways to accomplish some purposes or developing solutions to job related problems that are evaluated as new and appropriate. This perhaps could provide an explanation of the relatively high level of creative behavior reported in this study.

Another possible explanation for the result is the high level of education among the respondents in this study. Almost all participants in this study have tertiary education degree where a large majority of them (almost 75%) earned at least a degree in their area of expertise. To obtain such qualification will require the respondents to at least possess certain level of intellectual ability. Kaufmann, Quilty, Grazioplene, Hirsh, Gray, Peterson and DeYoung (2015) in their study confirmed that both ability and motivation components of intellect are important for creative scientific achievement. The ability component includes verbal and ideational fluency, mental flexibility, working memory, and the strategic retrieval and manipulation of knowledge whereas the motivation component reflects intellectual curiosity, and drive (Beaty & Silvia, 2012; Gilhooly, Fioratou, Anthony, & Wynn,

2007; von Stumm, Benedikt, & Chamorro-Premuzic, 2011). These appear to be more important for creativity in the scientific field and hence could possibly justify the finding of this study.

5.3.3 The Relationship between Autonomy, Work Motivation and Creative Behavior

In this study, it was hypothesized that autonomy will enhance work motivation of employees and facilitates creative behavior. The result supported the hypothesized mediation impact of work motivation on the relationship between autonomy and creative behavior. This finding is consistent with the findings by previous research in which empirical evidence indicates that experiencing autonomy is conducive to several innovation-related activities. Autonomy is the degree to which an employee has freedom, independence, and discretion in carrying out the tasks of the person's job. Previous work has demonstrated positive associations between autonomy at work and work motivation and various creative related activities such as idea suggestion efforts (Axtell et al., 2000; Krause, 2004), voice behaviors (Fuller, Marler, & Hester, 2006), idea implementation activities (Frese et al., 1999) and creative behavior and performance (Cekmecelioglu & Gunsel, 2011; Oldham & Cummings, 1996; Shalley & Gilson, 2004).

SDT is a motivation theory that focuses on the fulfillment of innate psychological needs that are necessary to trigger autonomous motivation and bringing forth beneficial work outcomes. People's volitional motivation- specifically the degree to which a person experiences his or her action as autonomous that is acting based on

choice, interest, pleasure or values is suggested to enhance motivation and later lead to heighten creative behavior. Based on the needs fulfillment standpoint, satisfying the need for autonomy makes individuals more likely to engage in self-directed and self- started behaviors (Strauss & Parker, 2013; Devlooa, Anseela, De Beuckelaerab, & Salanovac, 2015) and behaviors based on autonomous motives will foster persistence and performance outcomes (Chirkov, Ryan, Kim, & Kaplan, 2003; Nie, Chua, Yeung, Ryan & Chan , 2015). Employees who have the sense of free will to do something or act out of their own interests and values experience greater motivation to exert their effort, energy and resources to engage in creative processes in performing their work. Hence, the link between autonomy, work motivation and creative behavior is supported in this study.

Apart from support from the literature, the contextual background of the study may also justify the finding of this study. The respondents in this study are researchers and engage in R and D activities. Past studies consistently showed that people who are involved in scientifically creative activities such as researchers do possessed certain traits that are relevant to people who are scientifically creative. One of the personal traits pertinent among scientifically creative people is self-determination. People who are self-determined know what they want and how to get it. They choose and set goals, then work to reach them. People with high self-determination advocate on their own behalf, and are involved in solving problems and making decisions about their lives. Self-determined people put so much importance on autonomy and autonomously-motivated people acting in the work context are more likely to pay attention and invest more effort and demonstrate greater interests and involvement in performing their jobs (Deci, Ryan, & Williams, 1996; Deci et al.,

1991; Nie et al., 2015; Ntoumanis, 2005). This could possibly help explain the finding of this study that is supportive of the autonomy, motivation and creative behavior link.

Another plausible explanation would be on the researchers' job itself. A job as a researcher is highly demanding with very broad job scope that requires the incumbent to work autonomously and perform multiple roles and assume numerous responsibilities. Building on the central tenet of Job Demand Resources model (Bakker & Demerouti, 2007), autonomy is a necessity in performing a highly demanding job since autonomy is expected to be positively related to intrinsic work motivation and other positive work outcomes (Fagerlind, Gustavsson, Johansson, & Ekberg, 2013; Hackman & Oldham, 1980; Van Yperen & Hagedoorn, 2003; Van Yperen, Wörtler, & De Jonge, 2016). Another way to explain this situation is that the arousal produced by high job demands will enhance the employees' intrinsic motivation when they perceive that they have the autonomy to manage and effectively cope with the high demands and later positively affect their performance at work. An optimal fit between workers and their jobs creates synergy, and, accordingly, better outcomes such as intrinsic work motivation and performance such as creative behavior.

5.3.4 The Relationship between Culture (IOVC), Work Motivation and Creative Behavior

In this study, innovation-oriented value culture (IOVC) was hypothesized to positively associated with work motivation and consequently enhance creative

behavior. However, the finding in this study did not support the hypothesized notion. Hence, the finding of this research is inconsistent with the literature that provides a strong link respecting the relationship between culture and creativity such as studies by Hurley and Hult (1998), Navaresse (2008) and Thellis, Prabhu and Chandy (2009). An important aspect of culture that is cited as vital to creativity is cultural openness. Cultural openness concerned with the organization's cultural attention needed to recognize the need for creative effort and would ultimately determine whether such initiatives are adopted or rejected (Van de Ven, 1986; Dobni, 2008).

One of the probable reasons why the finding in this study is not consistent with previous findings is the different context in which the measurement was used to measure innovative culture. Culture refers to the complex and elaborate system of meaning and behavior that defines the way of life for a group or society. Different cultures may place different priorities on similar societal needs, as guided by the cultural values created through socialization processes (Erez and Nouri, 2010). Navaresse (2008) and Stock, Six and Zacharias (2013) have tested the measurement in the advanced economies in the western context. In this study, the IOVC measurement was utilize to gauge innovative culture in an emerging economy in the Malaysian context. Malaysian researchers who came from a collectivist and high power distance society might interpret and respond to the IOVC items differently from their counterparts in an individualistic and low power distance background. Therefore, it is expected that the results yield in this study will be different from other studies conducted in a different context.

Another plausible explanation would be due to the contextual background of the study. Descriptive statistics showed that 56.2 percent of the respondents, that is the majority in this study, have less than five year tenure with their current organization. Moreover, a large percentage of them have less than 2 years of tenure with their organizations. Internalization and incorporation of organizational beliefs and values do not take place overnight. It usually takes some time for the assimilation process and the internalization of certain organizational values and beliefs to occur, therefore might affect the responses obtained in this study.

5.3.5 The Relationship between Reward, Work Motivation and Creative Behavior

This study postulated that rewards will have a positive effect on work motivation and creative behavior. Consistent with Amabile's New Motivation Hypothesis (1983, 1996), reward is postulated to have positive effects on work motivation of employees because if they are being administered to indicate good performance, the competence and autonomy needs will be fulfilled and will positively influence employees' motivation and later other positive behavioral outcomes (Amabile, 1996; Deci & Ryan, 1980; Deci& Ryan 2008). However, this hypothesis was not supported by the finding in this study.

Despite the many studies examining rewards and creativity in the psychological, educational, and organizational literatures, rewards' effects on creativity remain unclear. The finding in this study is inconsistent with many studies that found that rewards affect (could be either enhance or mitigate) motivation and later have the

influence on the demonstration of creative behavior (Amabile, 1982; Benabou and Tirole, 2003; Byron & Kazanchi, 2012; Eisenberger & Rhoades, 2000; Guay, Vallerand & Blanchard, 2000; Grant and Berry (2011). However, a study by Hewitt and Conway (2016) found that the effect of reward salient on motivation was non-significant, hence consistent with the finding of this study.

To further examine the effects of rewards on motivation and creativity, Byron and Kazanchi (2012) had performed a meta-analysis that may help explain the variability found among studies and determine the conditions that enhance, mitigate, or have little or no effect on the relationships between rewards and creativity. The link between rewards and motivation and creativity is not as simple as assumed. Rather, the relationships are highly contextual, complex and multi-dimensional. One of the remarkable factors that lead to this unclear and inconsistent finding is the underlying theories that attempt to explain the link. In creativity, the literature on the rewards-creativity link showed that most studies assessing the relationship between rewards and creative behavior relied on two major theories. The two theories are SDT and learned industriousness theory (LIT). In this study, the link between rewards and motivation and creativity was established using the SDT perspective.

SDT relies on cognitive processes whereas LIT depends on behavioral processes to explain how rewards and other contextual factors may increase or decrease individuals' intrinsic motivation and hence subsequent performance. Considering these assumptions and interpretations, SDT and LIT put forth different theoretical mechanisms regarding how rewards may affect motivation and subsequently creative behavior and hence, lead to the varying results obtained in the studies in this area.

Apart from the theoretical explanation, another possible justification for the finding is how the respondents may interpret and evaluate reward in this study. Among the items used to measure rewards in this study are: 1) I am motivated by the opportunity to receive monetary reward; 2) The reward offered was reasonable for this job. As discussed earlier, an important trait of researchers is that they are self-directed and innately driven in perfoming their tasks. To provide answers to questions that basically ask about how they value extrinsic rewards such as monetary rewards would probably lead to cognitive conflict that refers to mental discomfort when they experience contradiction between their beliefs, values and behavior. Therefore, the responses obtained might not reflect what the respondents really feel about the presence of rewards in their work or they simply refuse to provide accurate responses to the items.

Finally, the demographic composition of the respondents could also possibly provide and explanation of the finding. As found in the descriptive statistics analysis for the study, a majority of the respondents (69.7%) reported that they did not receive any type of rewards for their work. This is perhaps because the respondents interpret rewards as something salient enough such as a large sum of monetary rewards to fund their projects or as merit for outstanding achievement. Since the respondents defined reward in such way, a high percentage of the respondents reported that they did not receive any reward for their work and it is possible that they could not provide accurate responses to the questions asked on rewards. Therefore, in this study, rewards failed to be perceived as the facilitating or hindering factor that could influence work motivation and creative behavior at the workplace.

5.3.6 The Relationship between Supervisory Style, Work Motivation and Creative Behavior

The intrinsic motivation perspective supported the notion that supervisor support is effective in spurring employee creative behavior (Anderson et al., 2014; Oldham & Cumming, 1996). Supportive supervisors care about employees' well-being and value their contributions (Eisenberger, Huntington, Hutchison, & Sowa, 1986), which elevate innovative behavior via its salutary effect on intrinsic motivation (e.g., Anderson et al., 2014; Oldham & Cumming, 1996; Shalley & Gilson, 2004; Shalley, Zhou, & Oldham, 2004).

In this study, it is hypothesized that a supervisor who shows a high level of concern for employees' feelings and needs, encourages the employees to voice their concerns, provide support and resources could boost the levels of interests and motivation in creative work activities. The finding however could not provide support for the hypothesized notion. Results from previous research showed mixed empirical findings. Recent meta-analytical reviews, on the other hand reveal only a small, positive effect of supervisor support on subordinate innovation (Hammond Neff, Farr, Schwall, & Zhao, 2011; Rosing et al., 2011).

One plausible explanation is that although the intrinsic motivation perspective seems reasonable, can be overly simplistic (Chen, Li & Leung, 2016). The supervisory support-work motivation-creative behavior relationship is apparently more complex than previously thought. Drawing on the interactionist perspective that focuses on creativity and innovation as the product of the interplay of

contextual factors and employee characteristics (e.g., Shalley et al., 2004; Woodman, Sawyer, & Griffin, 1993), other factors, personal or contextual, could possibly influence the relationship. Hence, it involves further investigation on other relevant personal or contextual factors to help clarify the dynamics involved in the postulated relationship. As argued earlier, certain personality traits of the researcher for example self-directed, intrinsically motivated, autonomous and independent in their thinking and action could possibly have an undermining effect on effectiveness of supportive supervisory style.

5.3.7 The Moderating Effect of Job Involvement on the Relationships between Contextual Factors and Work Motivation

Of the five proposed hypotheses on job involvement as moderator, two were supported. In this study, drawing from the situationist perspective, motivation is perceived primarily as a consequence rather than an antecedent of job involvement (Brown, 1996). Hence, the hypotheses developed were to examine the moderating effect of job involvement on the relationships between the contextual factors (stressors, autonomy, culture, reward and supervisory styles) and work motivation.

First, statistical evidence supported the hypothesized relationship that job involvement moderates the relationship between stressor and work motivation. The finding showed that the interaction between stressor and job involvement is negative, therefore, the relationship between stressor and work motivation would be enhanced when job involvement is low. Second, statistical evidence supported the proposition that job involvement moderates the relationship between supervisory style and work

motivation, such that the positive relationship between supportive supervisory style and work motivation would be stronger when the researcher is less involved with his or her job.

These results of this study are consistent with Brown's (1996) and Rottenberry and Moberg's (2007) suggestion to examine the moderating effect of job involvement on work motivation and creative behavior. Diefendorff et al. (2003) also proposed the relationship and argued that job involvement should be hypothesized as having an important effect on employee's motivation and effort**.** Although no similar past studies were found to support the result of the current study, some literatures on performance that examined the moderating effect of job involvement were referred to as the basis for further discussion. Among studies that examined the moderating effect of job involvement on the relationship between various organizational factors and motivation are Hackman and Oldham, (1980); Kim, Herderson and Eom (2015) and Paarlberg, (2007).

Supportive leaders create conducive working environment to foster respect, trust, cooperation, and emotional support (Daft, 2005; Gibson et al., 2000) and bring successful results that are beneficial for the wellbeing of both employees and the organization. Therefore, supportive supervisory style could motivate employees, enhance their concentration and improve their performance (Oluseyi &Ayo, 2009). However, if the employees were highly involved in their job, the role and function of the supportive leaders would be undermined. A highly involved person has a high level of motivation and is willing to exert greater effort to solve problem and work intelligently. The respondents in this study were researchers who are assumed to

possess certain traits relevant to people who are scientifically creative. Scientifically creative people are self-determined, risk takers, highly intuitive, have superior strength of ego, and appreciate independence and autonomy (Dellas and Gaier, 1970; Kapur, Subramanyam & Shah, 1997). Therefore, this explains why high job involvement decreases the strength of relationship between supervisory style and work motivation.

In this study, it is postulated that the link between autonomy and work motivation is stronger when the employee is highly involved in his/her job. The finding fails to support this hypothesis. This could possibly be due to the similar interpretation attached to the two theoretically distinct constructs, job involvement and autonomy by the respondents. Hackman and Oldham (1980) referred to autonomy in a job as the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out. Job involvement, on the other hand, is an attitudinal construct defined as the degree to which one is cognitively preoccupied with, engaged in and concerned with one's present job and the person's identification of his or her job (Blau, 1985; Blau &Boal, 1987;Paullay et al., 1994; Rotenberry & Moberg, 2007). Although the two constructs are theoretically dissimilar, the items used to measure the constructs are presumably being interpreted as having the same meaning. For example, the item used to measure autonomy, "How much autonomy in your work? That is to what extent does your job permit you to decide on your how to go about doing the work?" and an item to measure job involvement, "Most of my interests are centred around my job" could possibly be interpreted by the respondents as to being the same question. This could later be reflected in the result of the

hypothesis testing in which the moderating effect of job involvement could not influence the relationship between autonomy and work motivation since the effect of job involvement was subsumed by the stronger construct of autonomy.

Job involvement was also postulated to moderate the relationship between reward and work motivation. However, the finding in this study again did not support the hypothesized notion. According to the intrinsic-undermining extrinsic perspective, an employee who is highly involved in his/her job is attracted with his/her job and should be most motivated by the job (Blau & Boal, 1987). When the person is highly involved with his/her job, the person is said to engage in the process of internalizing the values of the goodness of the job, and hence nurturing intrinsic motivation. Reward, in contrast, would diminish the intrinsically driven process. One plausible explanation for this result perhaps is on the context of this study. Since a significantly large majority (69.7%) of the respondents did not experienced any kind of inducements in terms of reward and recognition, it is possible that they could not provide accurate responses to the questions asked on rewards. This definitely affected the result obtained hence the hypothesis was not supported.

5.4 Implications of the Study

The implications of this study can be discussed in these two major aspects: theoretical, as well as practical. The discussions on the contributions of the study are presented in three different sections below.

5.4.1 Theoretical Implication

From the theoretical perspective, the finding provides valuable inputs for researchers on the relationship between the contextual factors and creative behavior. The study offered an integrated model of creative behavior by integrating work motivation and job involvement as the mediator and the moderator in a single study. First, in this study, the determination of the important contextual factors that might affect individual employee's creative behavior at work was done by utilizing both SDT theory and OTS theory. This is a fresh approach considering that self-determination theory is a meta-theory that lacks details in terms of what factors or variables should be considered when analyzing the effect of contextual factors on creative behavior. Therefore, this study attempts to provide a framework that could comprehensively explain creative behavior.

This study also examined work motivation to have an intervening effect on the relationship between the contextual factors and the expression of creative behavior at work. However, this effect has to be examined further since the effect of intrinsic work motivation differs from the effect of extrinsic work motivation. The finding in this study confirmed that only intrinsic work motivation mediates the relationship between the contextual factors and creative behavior. This is consistent with the Amabile's Intrinsic Motivation perspective that proposed that people's innate drive will be heighten when they do something for its inherent satisfaction. Extrinsic factors although could be controlled still did not yield the same effect as intrinsic motivation on creativity. Hence, it can be concluded that work motivation mediates the relationship between the contextual factors and creative behavior.

Finally, this study also attempts to test the moderating role of job involvement in the relationship between the contextual factors and work motivation. As suggested by Diefendorff et al. (2003) and Rottenberry and Moberg (2007), job involvement should be hypothesized as having an important effect on employee's motivation and effort and subsequently determined creative behavior.

Overall, this research attempts to study creative behavior by extending SDT and introducing job involvement as the moderator in the research framework. The theoretical value of this research is that it has established the relevance of SDT in explaining the relationship between certain contextual variables and creative behavior as mediated by work motivation and the moderating effect of job involvement in a single model.

5.4.2 Practical Implication

The findings of the present study offer guidelines for practitioners, particularly managers and business owners who are currently involved in R and D activities for taking appropriate measures to encourage and facilitate the demonstration of creative behavior at work. Firstly, managers can use the findings to understand the factors that could possibly contribute to employees' creative behavior. More importantly, managers could use the model developed as a tool to examine the contextual factors and how it is likely to affect work motivation and the level of creative behavior, facilitate their efforts in designing effective measures to manage creativity at the workplace. By understanding what contributes to the demonstration of creative

behavior through work motivation, managers and organizations should be able to provide the necessary support to facilitate creativity as well as minimize the negative effect of certain hindrance factors that could possibly risked creativity.

The job itself is one of the contextual factors that could facilitate the demonstration of creative behavior. In this research, autonomy was identified as the characteristic of the job that was important to creativity. Autonomy increases ownership in one's job, that later leads to higher motivation and facilitates creative behavior. One of the ways to gain autonomy is by letting the employees set their own goals and determine the way to achieve those goals. Self-chosen goals nurture *intrinsic motivation* that could later facilitate creative behavior. Stressors, in this study particularly role ambiguity, was found to be a factor that could be detrimental to work motivation and creative behavior. Hence, managers should be more explicit in discussing the organizations' expectations of the researchers as well as their responsibilities and accountability.

Finally, organizations should be more cautious in designing and managing the micro, job-related factors that contribute to creativity. Effective designing of the job and how the job is implemented could encourage individual employees to perform creatively at work. Organizations could incorporate facilities and mechanisms that could enhance the expression of creative behavior by considering the multidimensional, multifaceted nature of creativity.

5.5 Limitations of the Study

Although efforts had been made to ensure the validity of the research findings, they should be cautiously interpreted by considering the following limitations. One limitation is the risk of sample bias. Potential bias might exist with regard to the distribution of the questionnaires to the private organizations. The researcher had no control over it as the questionnaire was distributed with the assistance of a contact person in the human resource department of the organizations, following the procedures of the organizations. To overcome this potential problem, the researcher provided a cover letter which highlights the importance of questionnaires distribution to the researchers in the study. Assumedly, these preventives were taken to increase the accuracy of the data obtained.

Another limitation that should be noted is the cross-sectional nature of the study. The study examined the relationship between contextual factors, work motivation and creative behavior with the influence of job involvement one point of time and not over time. Since the cross sectional data were used to test the hypotheses, causal inferences cannot be drawn in this study. Longitudinal studies would be useful to determine the causal relationship in the model.

The next limitation is related to common method variance (CMV). The study may suffer from common method bias due to a single informant approach. It is possible that participants misrepresented their perceptions. Therefore, the use of a single source for obtaining information may generate some measure of inaccuracy and lead to common method bias (Podsakoff et al., 2003). In order to address this issue,

several remedies proposed by Podsakoff et al., (2003) were taken to minimize the common method bias which includes applying the Harman-single factor test was also applied in the study to check the occurrence of CMV.

The last limitation relates to the sample feature, in which more than half of the participants (75.6%) were in the position for less than five years. Their perceptions might be different from others who have held the positions longer. Therefore, the findings could not be generalized to all researchers in Malaysia who might have different experiences and perceptions.

5.6 Recommendations for Future Research

A myriad of research opportunities can be identified from the present study. As there is evidence of creative behavior in the organizational context, future research may wish to apply the research model to validate its applicability in other contexts. Another avenue for future research is to examine other antecedents of creative behavior. For instance, future research may integrate the effects of other contextual factors in investigating antecedents of creative behavior. Apart from that, the research could be extended beyond the micro organizational context by examining macro contextual factors such as governmental policies and support towards R and D in Malaysia, the economic condition, cultural aspects and various factors that could possibly influence creative behavior at the workplace.

The association between creativity and innovation is highly contextual and multi-level in nature. Hence, researchers should carefully consider the relevant boundary

conditions when studying this vital relationship. The current study is among the very few attempts to investigate the role of few contextual factors, work motivation and job involvement in influencing creative behavior among researchers in Malaysian organizations. Further research is needed to provide additional insights into the issue. Future studies could introduce other moderators that might strengthen the relationship between the contextual factors and work motivation to facilitate creativity in the workplace. For instance, further research is needed to investigate the role of other demographic factors (e.g. experience in R and D and level of education) or personal traits (e.g. creative self-efficacy) in moderating the relationships between contextual factors, work motivation and creative behavior.

Since this study involved the cross-sectional research design, there might be issues on the limitation of data interpretation. Future research should consider conducting a similar study as a longitudinal study in order to identify the antecedents and outcomes of creative behavior. A longitudinal design would have enabled stronger evidence of the directional relationship between the contextual factors, work motivation, job involvement and creative behavior.

Finally, for generalization purpose, future studies might also consider a larger sample size. Data can be obtained from various governmental agencies and private sectors and from various industries. Apart from researchers, in future studies, respondents can be selected from other types of occupations and from various organizational levels.

5.7 Conclusion

Creativity is the driving force behind most businesses' success. Creativity and innovation are often the reason that businesses flourish in today's world. Given the many benefits of creativity at the workplace, organizations ought to be thinking of ways to nurture creativity at the workplace and at the same time foster and harness creativity among employees. Organizations should constantly struggle to create a workplace that is unorthodox with energetic and engaged employees and encourage the collaboration of creative minds and supportive work environment since this has the ability to push creative ideas into reality.

This study attempts to offer an integrated framework to explain creative behavior and enrich the existing literature by employing SDT as the underlying theory and OST to establish important and relevant antecedents in the framework. Consistent with the assertion that job involvement should be considered key in activating employee's motivation and serves as the precondition of creative behavior (Brown, 1996; Kahn, 1990; Pfeffer, 1994), the present study also attempts to examine the contingent effect of job involvement. In Malaysia, most studies on creativity were conducted within the education domain. This study is one of the few limited attempts to explore creative behavior within the organizational context and transcend beyond the boundary of a classroom.

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APPENDIX A

Dear Respondent,

RESEARCH ON THE CONTEXTUAL FACTORS, WORK MOTIVATION AND CREATIVE BEHAVIOR OF MALAYSIAN RESEARCHERS

Referring to the above matter, I would like to obtain your invaluable response and support in affiliation with my study. I am a lecturer from Universiti Utara Malaysia and my area of interest is human resource management/organizational behavior.

As part of my study, I am conducting a survey to examine how factors such as supervisory style, job design, stressors, and culture of the organization influence work motivation of the researchers, as well as creative behavior at work. I have undertaken this study because of the belief that the selected contextual factors play important role in determining work motivation and later influence the expression of creative behavior.

Your help in completing and returning this questionnaire is most appreciated! Completing the questionnaire would take about **20 minutes** of your time. All responses to this questionnaire will be kept confidential. Results will be used only for academic purposes with no specific individuals identified. I am most grateful if you could complete the attached questionnaire at your earliest, hopefully, within the next seven days. Please return the questionnaire in the self-addressed envelope provided or return it to the designated contact person in your organization.

When the study has been completed, a copy of the report can be made available to you. If you would like a copy, please provide your name and address on the last page of the questionnaire.

Thank you very much for your time and assistance.

Yours sincerely,

DARATUL AMBIA CHE MIT
Universiti Utara Malaysia
Tel No: 0195043164
E-mail: daratul@uum.edu.my

APPENDIX B

SECTION A

Please answer the following questions by circling or putting (/) mark on the number that best represents your opinion of the following statements.

Q1	**How accurately each of the following statements describe how you perform your work:**	Strongly Disagree (1)				Strongly Agree (5)
1	I try to find out new ideas about technologies, work processes, and products.	1	2	3	4	5
2	I suggest creative ideas.	1	2	3	4	5
3	I am the first person among my coworkers to try new ideas and methods.	1	2	3	4	5
4	I do my job with very creative and practical ways.	1	2	3	4	5
5	I try to approach solving a certain problem with new ideas or methods.	1	2	3	4	5

SECTION B

Please answer the following questions by circling or putting (/) mark on the number that best represents your opinion of the following statements.

Q2	**Based on the perception you have about your organization and the way employees (your boss, teammates, other managers, CEO, etc.) interact with you and among themselves, indicate to what extent you agree with each of the following statements:**	Strongly Disagree (1)				Strongly Agree (5)
1.	This organization is always moving towards the development of new answers.	1	2	3	4	5
2	Proposing new ideas is NOT the best strategy to succeed in this organization.	1	2	3	4	5
3	This organization is open and responsive to change.	1	2	3	4	5
4	I understand the rules for the distribution of rewards.	1	2	3	4	5
5	People on this team are always searching for fresh, new ways of looking at problems.	1	2	3	4	5
6	This organization will continue its path of success by strictly adhering to standards and current procedures.	1	2	3	4	5
7	This organization encourages people to behave creatively.	1	2	3	4	5
8	The rewards system is unfair.	1	2	3	4	5
9	Someone who suggests a new method will probably be heard and supported by managers.	1	2	3	4	5
10	This organization provides resources to help in the application of new ideas	1	2	3	4	5
11	Members are encouraged to share resources.	1	2	3	4	5
12	The rewards system of this firm encourages teamwork.	1	2	3	4	5
13	People in this organization should always check with a superior before introducing a change to an existing procedure.	1	2	3	4	5
14	Members are encouraged to cooperate with each other in order to innovate.	1	2	3	4	5
15	Assistance in developing new ideas is generally available.	1	2	3	4	5
16	This organization is always moving toward the development of new methods.	1	2	3	4	5
17	The rewards system of this organization encourages trust among team members.	1	2	3	4	5
18	In general, this organization is a very innovative organization.	1	2	3	4	5

19	In general, this organization rewards risk taking.	1	2	3	4	5
20	There seems to be a high level of conflict in this organization.	1	2	3	4	5
21	Proposing new methodologies is NOT the best strategy to succeed in this organization.	1	2	3	4	5
22	This organization rewards creative people.	1	2	3	4	5
23	Someone who brings a new idea is likely to be heard and supported by superiors.	1	2	3	4	5
24	This organization gives its employees freedom to execute their work.	1	2	3	4	5
25	The "tone" of the working environment contains humor/ playfulness.	1	2	3	4	5
Q3	**How strongly do you agree or disagree with each of the following statements about the rewards system utilized in your organization ?**	Strongly Disagree (1)				Strongly Agree (5)
1	The opportunity to receive a reward for performing my work played a significant role in directing my efforts.	1	2	3	4	5
2	I am motivated by the opportunity to receive monetary reward.	1	2	3	4	5
3	While performing my work, I felt pressured to meet someone else's specifications on how to do my work.	1	2	3	4	5
4	The reward offered was reasonable for this job.	1	2	3	4	5
5	I felt compelled to perform well because of the incentives I was guaranteed to receive.	1	2	3	4	5
Q4	**How strongly do you agree or disagree with each of the following statements about your motivation to perform your work?**	Never/Almost Always Never True of Me (1)				Almost Always True of Me (5)
1	I am not that concerned about what other people think of my work.	1	2	3	4	5
2	I prefer having someone set clear goals for me in my work.	1	2	3	4	5
3	The more difficult the problem, the more I enjoy trying to solve it.	1	2	3	4	5
4	I am keenly aware of the income goals I have for myself.	1	2	3	4	5
5	I want my work to provide me with opportunities for increasing my knowledge and skills.	1	2	3	4	5
6	To me, success means doing better than other people.	1	2	3	4	5
7	I prefer to figure things out for myself.	1	2	3	4	5
8	No matter what the outcome of a project, I am satisfied if I feel I gained a new experience.	1	2	3	4	5
9	I enjoy relatively simple, straightforward tasks.	1	2	3	4	5
10	I am keenly aware of the goals I have for myself.	1	2	3	4	5
11	Curiosity is the driving force behind much of what I do.	1	2	3	4	5
12	I'm less concerned with what work I do than what I get for it.	1	2	3	4	5
13	I enjoy tackling problems that are completely new to me.	1	2	3	4	5
14	I prefer work I know I can do well over work that stretches my abilities.	1	2	3	4	5
15	I'm concerned about how other people are going to react to my ideas.	1	2	3	4	5
16	I seldom think about salary and promotions.	1	2	3	4	5
17	I'm more comfortable when I can set my own goals.	1	2	3	4	5
18	I believe that there is no point in doing a good job if nobody else knows about it.	1	2	3	4	5
19	I am strongly motivated by the money I can earn.	1	2	3	4	5
20	It is important for me to be able to do what I most enjoy.	1	2	3	4	5

21	I prefer working on projects with clearly specified procedures.	1	2	3	4	5
22	As long as I can do I enjoy, I'm not that concerned about exactly what I'm paid.	1	2	3	4	5
23	I enjoy doing work that is so absorbing that I forget about anything else.	1	2	3	4	5
24	I am strongly motivated by the recognition I can earn from other people.	1	2	3	4	5
26	I have to feel that I am earning something for what I do.	1	2	3	4	5
27	I enjoy trying to solve complex problems.	1	2	3	4	5
28	It is important for me to have a platform for self-expression.	1	2	3	4	5
29	I want to find out how good I really can be at my work.	1	2	3	4	5
30	I want other people to find out how good I really can be at my work.	1	2	3	4	5

SECTION C

Please answer the following questions by circling or putting (/) mark on the number that best represents your opinion of the following statements.

Q5	**How strongly do you agree or disagree with each of the following statements about your supervisor/ immediate boss?**	Strongly Disagree (1)						Strongly Agree(7)
1	My supervisor helps me solve work-related problems.	1	2	3	4	5	6	7
2	My supervisor encourages me to develop new skills.	1	2	3	4	5	6	7
3	My supervisor keeps informed about how employees think and feel about things.	1	2	3	4	5	6	7
4	My supervisor encourages employees to participate in important decisions.	1	2	3	4	5	6	7
5	My supervisor praises good work.	1	2	3	4	5	6	7
6	My supervisor encourages employees to speak up when they disagree with a decision.	1	2	3	4	5	6	7
7	My supervisor refuses to explain his or her actions.	1	2	3	4	5	6	7
8	My supervisor rewards me for good performance.	1	2	3	4	5	6	7
9	My supervisor always seems to be around checking on my work.	1	2	3	4	5	6	7
10	My supervisor tells me what shall be done and how it shall be done.	1	2	3	4	5	6	7
11	My supervisor never gives me a chance to make important decisions on my own.	1	2	3	4	5	6	7
12	My supervisor leaves it up to me to decide how to go about doing my job.	1	2	3	4	5	6	7
Q6	**How strongly do you agree or disagree with each of the following statements about your job ?**	Strongly Disagree (1)						Strongly Agree(7)
1	My job permits me to decide on how I go about doing it.	1	2	3	4	5	6	7
2	The job denies me any chance to use my personal initiatives or judgment in carrying out the work.	1	2	3	4	5	6	7
3	The job gives me considerable opportunity for independence and freedom in how I do the work.	1	2	3	4	5	6	7
4	The actual work itself provides me with clues about how well I am doing aside from "feedback" from my supervisors or peers.	1	2	3	4	5	6	7
5	Just doing the work required by the job provides many chances for me to figure out how well I am doing.	1	2	3	4	5	6	7
6	The job itself provides very few clues about whether or not I am performing well.	1	2	3	4	5	6	7

Q7	**How strongly do you agree or disagree with each of the following statements about your job ?**	Very False (1)						Very True(7)
1	At work, my responsibilities seem to change from day to day and I have little control of the changes.	1	2	3	4	5	6	7
2	The explanation of what has to be done is not always very clear.	1	2	3	4	5	6	7
3	There are no specific evaluation criteria set up and I just don't know what is expected of me.	1	2	3	4	5	6	7
4	I may report to two or more supervisors who are as different as night and day. They may each desire 100 percent of my time. What is acceptable for one is inappropriate for the other.	1	2	3	4	5	6	7
5	The rigorous demand of work, especially overtime, sometimes requires me to cancel activities with my family and friends. The demands may also infringe upon my basic responsibilities in the home.	1	2	3	4	5	6	7
6	Deadlines, deadlines, and always deadlines.	1	2	3	4	5	6	7
7	I may find myself with a pile of work on my desk and everything was due yesterday.	1	2	3	4	5	6	7
8	Simply put, I am always given either too much work or too little time to finish it!	1	2	3	4	5	6	7

SECTION D

Please answer the following questions by circling or putting (/) mark on the number that best represents your opinion of the following statements.

Q8	**Below are a number of statements each of which you may agree or disagree with depending on your own personal evaluation of your present job. Please indicate the degree of your agreement or disagreement with each statement:**	Strongly Disagree (1)					Strongly Agree (6)
1	The most important things that happen to me involve my present job.	1	2	3	4	5	6
2	I'll stay overtime to finish my job, even if I'm not paid for it.	1	2	3	4	5	6
3	To me, my job is only a small part of who I am.	1	2	3	4	5	6
4	I am very much involved personally in my job.	1	2	3	4	5	6
5	Generally, I avoid taking on extra duties and responsibilities in my job.	1	2	3	4	5	6
6	I live, eat, and breathe my job.	1	2	3	4	5	6
7	Sometimes I'd like to kick myself for the mistakes I make in my job.	1	2	3	4	5	6
8	Most of my interests are centered around my job.	1	2	3	4	5	6
9	I have very strong ties with my present job which would be very difficult to break.	1	2	3	4	5	6
10	Usually I feel detached from my job.	1	2	3	4	5	6
11	Most of my personal life goals are job-oriented.	1	2	3	4	5	6
12	I feel depressed when I fail at something connected with my job.	1	2	3	4	5	6
13	I consider my job to be very central to my existence.	1	2	3	4	5	6
14	I have other activities which are more satisfying than my job.	1	2	3	4	5	6
15	I like to be absorbed in my job most of the time.	1	2	3	4	5	6

SECTION E

Please fill in the blank.

1	What is your current position in the company?			
2	How long have you been in the current position ?		Years	
3	How long have you been with the company ?		Years	
4	Your gender: Male (M) or Female (F)		(Please state **M** or **F**)	
5	Your age is:		Years	
6	Your highest level of education is:		Doctorate	
			Masters	
			Degree	
			SPM/STPM/Diploma	
7	Experience in R & D.	**Year**	**Organization**	**Position**
8	State your achievement throughout your career as a researcher:	**Year**	**Achievement/Patent / Medal**	

Please use this space to write any comment you wish to make.

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THANK YOU VERY MUCH FOR YOUR KIND COOPERATION

APPENDIX C

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.721	16.042	16.042	15.721	16.042	16.042
2	8.238	8.407	24.449			
3	5.804	5.923	30.371			
4	4.230	4.317	34.688			
5	3.934	4.014	38.702			
6	3.288	3.355	42.057			
7	2.843	2.901	44.958			
8	2.502	2.553	47.511			
9	2.364	2.413	49.924			
10	2.069	2.111	52.035			
11	1.863	1.901	53.936			
12	1.833	1.870	55.806			
13	1.709	1.744	57.551			
14	1.649	1.683	59.234			
15	1.505	1.536	60.770			
16	1.424	1.454	62.223			
17	1.382	1.410	63.634			
18	1.313	1.340	64.973			
19	1.262	1.288	66.261			
20	1.196	1.221	67.482			
21	1.145	1.168	68.650			
22	1.137	1.160	69.811			
23	1.061	1.082	70.893			
24	1.040	1.061	71.954			
25	1.001	1.021	72.975			
26	.960	.980	73.955			
27	.950	.969	74.924			
28	.923	.942	75.866			
29	.895	.914	76.780			
30	.866	.884	77.664			
31	.853	.870	78.534			
32	.789	.805	79.339			
33	.772	.788	80.127			
34	.749	.764	80.891			
35	.733	.748	81.639			
36	.716	.731	82.370			
37	.709	.724	83.094			

38	.692	.706	83.800
39	.636	.649	84.449
40	.630	.643	85.092
41	.582	.593	85.685

APPENDIX C: continued

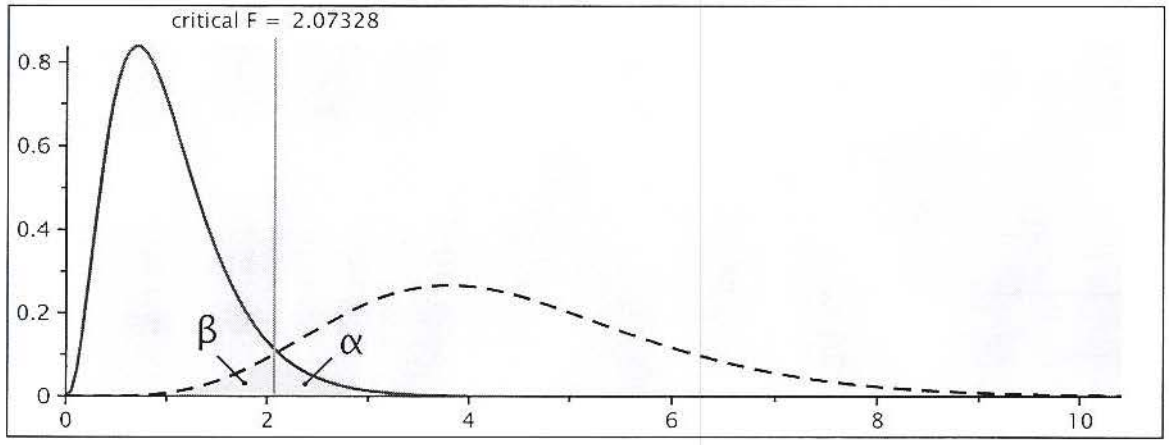
42	.573	.585	86.270
43	.545	.556	86.826
44	.534	.545	87.371
45	.505	.515	87.886
46	.493	.503	88.389
47	.480	.490	88.879
48	.476	.486	89.364
49	.443	.452	89.816
50	.431	.440	90.256
51	.419	.428	90.684
52	.397	.405	91.089
53	.390	.398	91.487
54	.374	.381	91.868
55	.362	.369	92.238
56	.360	.367	92.605
57	.344	.351	92.956
58	.331	.338	93.294
59	.321	.327	93.621
60	.317	.324	93.945
61	.293	.299	94.243
62	.285	.291	94.534
63	.277	.283	94.817
64	.268	.273	95.090
65	.261	.267	95.357
66	.250	.255	95.612
67	.244	.249	95.861
68	.239	.244	96.104
69	.225	.230	96.334
70	.223	.227	96.562
71	.212	.217	96.778
72	.205	.209	96.987
73	.200	.204	97.191
74	.185	.188	97.379
75	.177	.180	97.560
76	.174	.178	97.737
77	.166	.170	97.907
78	.154	.157	98.064
79	.150	.153	98.217
80	.142	.145	98.362
81	.139	.142	98.504
82	.133	.136	98.640

83	.125	.128	98.767			
84	.123	.125	98.892			
85	.113	.115	99.008			
86	.106	.108	99.116			

APPENDIX C: continued

87	.105	.108	99.223			
88	.097	.099	99.322			
89	.093	.094	99.416			
90	.092	.093	99.509			
91	.086	.088	99.597			
92	.081	.082	99.680			
93	.069	.070	99.750			
94	.059	.060	99.811			
95	.053	.054	99.864			
96	.048	.049	99.913			
97	.045	.046	99.959			
98	.040	.041	100.000			

APPENDIX D



F tests – Linear multiple regression: Fixed model, R^2 deviation from zero

Analysis:	A priori: Compute required sample size		
Input:	Effect size f^2	=	0.15
	α err prob	=	0.05
	Power (1–β err prob)	=	0.95
	Number of predictors	=	7
Output:	Noncentrality parameter λ	=	22.9500000
	Critical F	=	2.0732820
	Numerator df	=	7
	Denominator df	=	145
	Total sample size	=	153
	Actual power	=	0.9503254