

# CAREER ASPIRATIONS OF R&D PROFESSIONALS IN GOVERNMENT RESEARCH INSTITUTES AND MULTINATIONAL CORPORATIONS IN MALAYSIA\*

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**Abstract.** *The research compares the influence of self-efficacy, organizational socialization and continuous improvement practices on career aspirations of research and development (R&D) professionals of government research institutes (GRIs) and multinational corporations (MNCs) in Malaysia. This study used Social Cognitive Career Theory (SCCT) to examine the influence of the selected variables on career aspirations of the R&D professionals. Data were collected from 164 respondents from GRIs and 120 respondents from MNCs in the country. The data were analyzed using descriptive statistics and multiple linear regressions. The two groups differed significantly in terms of their levels of self-efficacy and organizational socialization, and were not significantly different in continuous improvement practices and career aspirations. Self-efficacy and organizational socialization levels of R&D professionals in GRIs were found to be slightly higher than those of MNCs. Regression results showed MNCs reported higher explanatory power compared to that of the GRIs in terms of variance in career aspiration. This study suggests that continuous improvement practices and self-efficacy are relevant to the model of SCCT. Managers and human resource development (HRD) practitioners in both types of organizations need to restructure the work practices of R&D professionals by strengthening the quality improvement work procedures and cognitive-behaviour initiatives.*

**Key words:** *career aspirations, continuous improvement practices, organizational socialization, R&D professionals, self-efficacy.*

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\* This study was sponsored by Research University Grant Scheme (RUGS) of Universiti Putra Malaysia, Serdang, Selangor, Malaysia 2007-2009 (Vote Number: 5523067).

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## Introduction

Managing careers of research and development (R&D) professionals is becoming more complex due to several reasons: i) R&D professionals are associated with multi-faceted tasks and this resulted in diversity in their career route preferences such as technical, managerial, project to project and entrepreneurial paths (Petroni, 2000; Ferrary, 2008); ii) the emergence of the concept of protean career in which the entire responsibility of career management is more on the individuals rather than the organizations. This relates to the other emerging concepts of intelligent careers and post-corporate careers (Baruch, 2004); iii) the identification of new terms of career aspiration among them, namely, the impassioned scientist, the strategic opportunist, the balanced scientist, and the organizational careerist (Mallon, Duberly & Cohen, 2005), which shows the dynamic interaction between science, the organization and the individual; and iv) fast technological advancement leads to complexity in R&D professionals' roles and various reward systems that are associated with innovations (Roberts, Wermus, Gibson, & Gober, 2002). Thus R&D professionals have various views about their career options and career aspirations. This is likely to impact in terms of how R&D professionals make sense of their careers and how organizations adapt to their career management practices.

Malaysia, with a population of 28 million in 2009, is a fast developing nation in the emerging economies of South-East Asian region. The Government has recognized both R&D roles as an important factor in helping the country to flourish its economy (MASTIC, 2008). Today, Malaysia has successfully transformed its economy from one that relied primarily on agriculture to a manufacturing-based economy. It is moving into the phase of high-technology and knowledge-economy. During the Ninth Malaysia Plan (2006-2010) (Malaysian Government, 2006), R&D had been given due priority by the increase in national gross expenditure on R&D from RM1.7 billion in 2000 to RM4.3 billion in 2005 (MASTIC, 2008). However, internationally the expenditure on R&D in Malaysia is only 0.3% compared to that of a developed country such as Japan, 3.1% in 2002 (UNDP, 2007).

There are several R&D indicators believed to contribute to the growth of the economy of a country. The most common indicators are the numbers of researchers per million people, the percentage of R&D expenditure to GDP, and the numbers of patent granted to residents (UNDP, 2007). Among the stated R&D indicators, the numbers of researchers had been chosen as the main focus in this study. Realizing the increasing significance of R&D activities for the future growth for most organizations, the importance of having competent R&D professionals is inevitable for Malaysia. R&D professionals refer to individuals who are engaged in the conception and creation of new knowledge, products, processes, methods and systems as well as those who are directly involved in the management of projects to the point of its commercialization (OECD, 2008). They are the main assets in generating R&D programs. These professionals are also known as scientists, R&D engineers, research officers or social science researchers

who are doing research and development of theories, products and commercialization of the products, with an ultimate aim of wealth creation of the country.

R&D professionals in Malaysia come from government research institutes (GRIs) and multinational corporations (MNCs). There are 10 GRIs in the country responsible for R&D activities based on economic commodities such as palm-oil, rubber, general agriculture, power, nuclear technology, forestry, transportation, ICT, etc. It is asserted that MNCs started their R&D operations overseas because of the need to exploit the corporations' technology through adaptation of local circumstances and technology transfers, shortening of product cycles where they move new products from development to market at more rapid pace (Belderbos, 2002; Mairesse & Mohnen, 2005). In addition, many MNCs from developed countries have been outsourcing their labour to developing countries due to lower cost of employment in the latter (Sun, von Zedtwitz, & Simon, 2007). There is no exception in Malaysia where a large number of MNCs set their operation in the country in line with their R&D mission for global expansion, not to mention the huge economic benefits gained by the host country.

The various categories of R&D professionals have multiple views about their career aspiration. However, as far as Malaysian R&D professionals (be they in GRIs or MNCs) are concerned, little is known about their career aspirations and what affects their choices of aspirations. These R&D professionals may differ from other executives in other organizations, in terms of what they aspire in their careers. Additionally, differences may exist between those in GRIs or MNCs. In view of this knowledge gap, there is a need to study about their aspiration as this would affect their career orientations and, consequently, career management practices of the organizations. Hence, the research questions of this study are as follows:

1. Is there any difference between career aspirations of R&D professionals in GRIs and MNCs?
2. What is the relationship between self-efficacy, organizational socialization and continuous improvement practices with career aspirations of R&D professionals in both types of organizations?
3. What factors contribute to the explanation of the variations of career aspirations of professionals in the two types of R&D organizations?

Therefore, the main goal of the article is to examine the levels of career aspirations of R&D professionals in GRIs and MNCs as well as to ascertain the influence of self-efficacy, organizational socialization and continuous improvement practices on career aspirations of professionals in the two types of R&D organizations. The article is organized as follows: first, a literature review on R&D professionals' career is discussed, followed by the theoretical framework of the study including justification on the variables used in the study. The next section is on the research procedures undertaken, results and discussion of the study, after which conclusions and recommendations of the study are presented.

## Literature Review

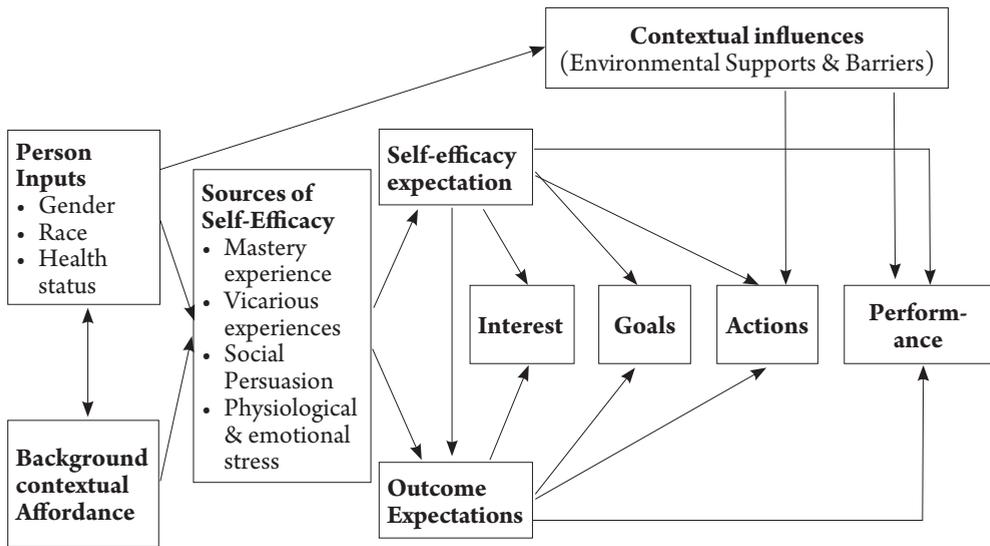
### *R&D Professionals' Careers*

Most organizations have developed different models of R&D activities and career strategies to manage their R&D workforces (Lam, 2005). For that reason, in order to understand R&D challenge, we must consider, among others, the management of individuals. One of the most important career development initiatives for R&D professionals is toward supporting their career goal (Chen, Chang & Yeh, 2006). It is vital to provide these professionals motivations and direction to help them evaluate their future career development. This intrinsic motivation for succeeding their career is called career aspirations (Farmer, 1985). Past researches on R&D professionals' career aspiration revealed several categories of their aspirations, namely, managerial, technical, project-to-project, technical transfer, and entrepreneurial (Allen & Katz, 1986; 1995; Petroni, 2000; Kim & Cha, 2000). From the categories of R&D professionals' career orientation, it shows that they have various views on career aspirations.

These categories of career aspirations keep on changing due to dynamism of environment that depends upon technology. Several studies on R&D professionals' careers have identified factors that influenced their career aspirations such as their self-efficacy (Zhao, McCormick & Hoekman, 2008), organizational socialization (Bigliardi, Petroni & Ivo Dormio, 2005) and quality management (Kumar & Boyle, 2000). These three groups of variables become the basis of this study framework. However, little is known about the influence of the three variables on career aspirations of R&D professionals in Malaysia.

### *Theoretical Framework*

This study adopted Social Cognitive Career Theory (SCCT) as its underlying theoretical framework. This theory was derived from Bandura's (1978) general social cognitive theory to further understand career interest, goals, and performance processes. This theory features several variables (e.g. outcome expectations, and personal goals) that help to guide career development (Lent, Brown & Hackett, 1994). It further discusses how these variables interrelate with persons' aspects (e.g., self-efficacy and gender) and their environments (e.g., organizational supports, socialization and initiatives) within the process of career development. The interactions between person and environment will form learning experience. These learning experiences will influence perceived self-efficacy and outcome expectation in one's career pursuit. The relevant self-efficacy beliefs and outcome expectations will then develop career-related interests, goals and performance, including aspiration. This supported the ideas that when people form constant interest in an activity where they believe themselves to be competent, they anticipate that performing it will make valued outcomes (e.g. job promotions and better pay). The SCCT consists of two components. The first component is about learning experiences that will shape self-efficacy and outcome expectations. Figure 1 shows that person's physical background interacts with contextual affordance background they are exposed to to form a variety of learning experiences and reflects the way they see themselves in relation to careers.



Source: Lent, Brown, & Hackett (1994).

FIGURE 1. Key constructs and processes in Social Cognitive Career Theory.

The second component involves external factors to the person which are called environmental supports to career goals, such as social, cultural, economic and parental support (Flores & O'Brien, 2002), and multiple role conflict (McWhirter, Torres & Rasheed, 1998). The environment variables are then divided into proximal and distal influences. Proximal influences are defined as nature external barriers to career goals that occur instantly, while distal influences need time to occur (e.g. opportunity for skill development that helps to shape interests and self-cognitions). SCCT also concerns with career performance consisting of level of individual achievement in their work and the degree to which they persist at a particular work activity. It is asserted that performance is influenced by ability, self-efficacy, outcomes expectation, and performance goals. Ability has its effect on self-efficacy and outcome expectations.

SCCT theory is a theory that emphasizes contents and processes of career development. Content refers to the influences on career development of a person and its context in which the person lives, while process refers to interaction and change over time or a series of stages through which individuals pass (Patton & McMahon, 2006). Therefore, SCCT takes into account both characteristics of the R&D professionals' person factor and their continuous interaction with R&D environment to build the goals they aspired in their career. For example, researchers who had minimal exposure to R&D career pathway will build their career self-efficacy by observing how those successful researchers cope with barriers to achieve career goals (Bakken, Byars-Winston & Wang, 2006; Baruch, 2004; Lent, Brown, & Hackett, 2000).

Therefore SCCT will help in recognizing factors leading to R&D professionals' career aspirations based on the selected SCCT variables (Nauta & Epperson, 2003; Smith

& Fouad, 1999). The first variable is self-efficacy, chosen because in R&D, researchers need high interest, intuition and determination to cope with requirements in the innovation process. They need high belief in their ability to grasp new knowledge to the production of technologies (Markman, Balkin & Baron, 2002). Self-efficacy shows high impacts on R&D professionals since the scientific discovery requires sustained effort and strong self-confidence.

The second variable was organizational socialization to represent background contextual affordance to R&D professionals' career aspiration as it is believed that individuals who perceive positive environmental condition will tend to have stronger connection between their interest, goals, and actions than those who perceive many barriers (Lent et al., 2000). It is believed that the rapidly changing work environments encourage R&D professionals to affect the nature of their career aspirations (Allan & Katz, 1986). It is an individual learning process, for instance, through training provided by the organization, understanding the roles, social knowledge while interacting with co-workers, and expectation toward future prospect of the organization.

The third variable is continuous improvement practices which is a group of quality practices used in R&D standard operation procedures (MASTIC, 2008). Continuous improvement practices have been chosen to represent positive contextual influences in forming the innovative behaviour among the R&D professionals. It had been identified that this innovative behaviour plays a significant role in enhancing R&D professionals' career aspirations (Jorgensen, Boar & Laugen, 2006; Roger, 1995).

Therefore this research is based on SCCT deriving three groups of variables as indicated above. While studies on the influence of individual, organizational and environmental factors on career aspirations of professionals are numerous, however, they were based on western context (Allen & Katz, 1986; 1995; Petroni, 2000; Kim & Cha, 2000) that could not be generalized elsewhere, particularly in Malaysia, due to different sociocultural and economic contexts. Therefore, this study is the first of its kind conducted in Malaysia, particularly taking into account the influence of self-efficacy, organizational socialization and continuous improvement practices on career aspirations of the R&D professionals in the GRIs and MNCs.

### ***Research Framework and Hypotheses***

A research framework (Figure 2) has been developed to describe the variables used in the study. It was argued that three variables were predicted to influence career aspirations of R&D professionals in Malaysian GRIs and MNCs settings. Self-efficacy, organizational socialization and continuous improvement practices were the independent variables and career aspiration of R&D professionals was the dependent variable. Self-efficacy is believed to influence goal-setting and level of aspiration of R&D professionals (Gist & Mitchell, 1992). Based on the above argument we proposed the following hypothesis:

**H<sub>1</sub>** – Self-efficacy positively influences career aspiration of R&D professionals in GRIs and MNCs.

Organizational socialization had significant impact on career aspiration among R&D professionals (Bigliardi et al., 2005). This leads to the second variable in this framework, where organizational socialization is an important factor that lies under the SCCT's background contextual affordance for R&D professional. Organizational socialization of R&D professionals consists of four domains of learning experiences which are training they received, understanding their role in the organization, co-worker support and future prospects of their career. It is believed that R&D professionals who perceive higher learning experiences will tend to have better career aspirations (Lent et al., 2000). The second hypothesis is as follows:

**H<sub>2</sub>** – organizational socialization positively influences career aspiration of R&D professionals in GRIs and MNCs.

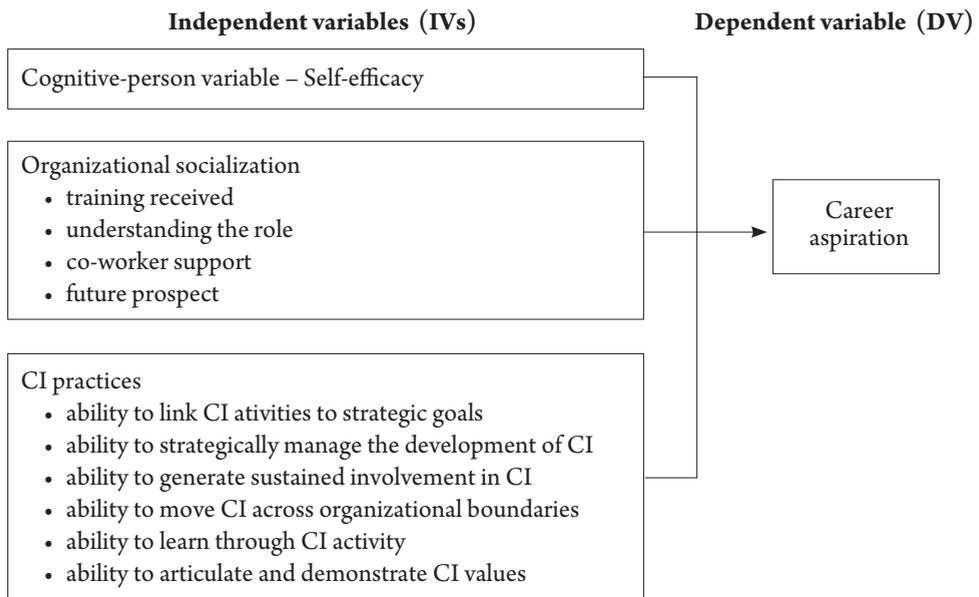
Quality improvement plays a significant role in enhancing several performances in R&D settings (Kumar & Boyle, 2001). One of the quality improvement initiatives is the group of continuous improvement practices. Continuous improvement practices have been chosen to represent the SCCT's positive contextual variables in forming the innovative behaviour among the R&D professionals.

This behaviour is portrayed through the R&D professionals' ability in six major domains which are the ability to link continuous improvement activities to strategic goals, the ability to strategically manage the development of continuous improvement, the ability to generate sustained involvement in continuous improvement, the ability to move continuous improvement across organizational boundaries, the ability to learn through continuous improvement activities, and the ability to articulate and demonstrate continuous improvement values. It has been identified that this group of innovative behaviours plays a significant role in enhancing R&D professionals' career aspirations (Roger, 1995). Therefore, the third hypothesis is as follows:

**H<sub>3</sub>** – continuous improvement practices positively influence career aspiration of R&D professionals in GRIs and MNCs.

As a conclusion, the three factors were chosen as they fit into the core components of SCCT, namely the contexts and processes and the variables are very relevant to the work of R&D professionals. Self-efficacy represents the context, particularly the individuals and factors affecting their cognitive levels in doing R&D functions. Organizational socialization and continuous improvement practices represent the processes, particularly, what has been undertaken and experienced by the professionals in performing their R&D tasks.

Career aspiration of R&D professionals was based on eight career anchors identified by Schein (1996) that guide employees' career aspiration. They are technical/functional competence, managerial competence, autonomy, security (job and geographic), sense of service, pure challenge, lifestyle integration, and entrepreneurial creativity. Therefore, the study describes the influence of the above variables on career aspirations of R&D professionals in GRIs and MNCs, respectively.



Note: CI refers to continuous improvement

FIGURE 2. Research Framework of Career Aspirations for R&D Professionals

### Methods

The population of this study comprised R&D professionals from GRIs and MNCs in Malaysia. There were 23,092 of them identified in the country in 2004 (MASTIC, 2008) who include those from public institutions of higher learning. They were involved in various R&D fields such as natural sciences, information technologies, engineering, economics, social sciences and humanities. However, sampling was done by excluding R&D professionals from the institutions of higher learning due to their additional roles in teaching.

The study used simple random sampling technique (Gay & Airasia, 2000). The sampling frame consists of those that: 1) must have at least three years of work experience as a research officer; and 2) held at least a Bachelor degree in the related fields of science, engineering and social sciences. This is to ensure that they have experienced several R&D activities and already have clear views about their career path in the organizations. Letters were sent to the Human Resources Division of the 10 GRIs and MNCs listed under MASTIC (MASTIC, 2008) where selection of the respondents was made randomly by the human resource heads of the organizations contacted.

The sample size was determined using the G-power approach (Faul & Erdfelder, 1992). G-power is an interactive program that can perform high statistical power precision in behavioural research. G-power computes sample sizes for a given effect sizes, alpha-levels, and power values. G-power uses Cohen's (1992) effect size measure to determine an appropriate effect size according to type of the selected test. Therefore,

the convention values of Cohen's (1992) effect size for t-test (two-group t-tests) were 0.5, the alpha-level was 0.05 and the power value was 0.95. From the given data, G-power calculated the total minimum sample size of 176. As this study also applied multiple linear regression analysis, the convention values of Cohen's (1992) effect size for F-test (multiple regression) were used, that is 0.15. The alpha-level was 0.05 and the power value was 0.95. From the given data, G-power calculated the total sample size based on three predictor variables for each organization type was 119. A total of 164 respondents of this study were obtained from GRIs, while 120 respondents were from MNCs.

The data had been collected using a set of questionnaires sent by ordinary mail to the respondents through their respective Human Resource departments. The questionnaire consists of Schein's Career Anchor Inventory (Igbaria, Kassieh & Silver, 1999) for questions on career aspirations, the General Self-efficacy Scales (Schwarzer & Jerusalem, 1995) for questions on self-efficacy, the Organizational Socialization Inventory (Taormina, 1994) for questions on organizational socialization, and the Continuous Improvement Capabilities survey (Jorgensen et al., 2006) for questions on continuous improvement practices. The questionnaire was pre-tested on 49 R&D professionals from a selected R&D organization.

The questionnaire consists of questions that need respondents to answer based on Likert-scale items. Questions on career aspirations consist of 25 items. Examples are 'Remaining in my area of expertise throughout my career' and 'Being able to use my skills and talents in the service of an important cause'. There are 10 questions on self-efficacy. Examples are 'I am confident that I could deal efficiently with unexpected events' and 'I can solve most problems if I invest the necessary effort'. Organizational socialization consists of 20 questions; examples are 'The organization has provided excellent job training for me' and 'There are many chances for a good career with this organization'. Finally, continuous improvement practices section consists of 30 items, with two examples: 'Ideas and suggestions for improvement are responded to in a clearly defined and timely fashion' and 'People participate in improvement activities continuously'.

The data were analyzed using descriptive statistics, t-test analysis, Pearson Product-Moment correlation, and multiple linear regressions. To compare the mean scores of the two groups on a given variable, t-test was used. Pearson Product Moment Correlation analysis was used to explain the relationship among variables (self-efficacy, organizational socialization, CI practices and career aspirations), while Multiple Regression analysis helped to predict the contribution of the independent variables to R&D professionals' career aspirations from each type of organization.

Reliability of the instrument was carried out on the pre-tested and actual study instruments for comparison purposes. Reliability refers to the stability of the instruments and the consistency of the measures (Maxim, 1999). The score's consistency is indicated by the value of Cronbach's alpha. This procedure was based on the internal consistency of a test, which yields the average correlation of an item within a test. Cronbach alpha greater than 0.6 (Cohen & Cohen, 1983) was used as an acceptable value. The

reliability results for the pre-test and the actual study are shown in Table 1. The results showed that both pre-test and actual study reliability values were more than 0.60, which indicated that all of these scales were reliable in measuring the variables. The values in the actual study were slightly higher than those that obtained in the pre-test study.

TABLE 1. Cronbach's Alpha for Variables in GRIs and MNCs in Pre-test and Actual Study

Scale	Pre-test (n = 49)		Actual Study			
	Number of items	Cronbach's Alpha	GRIs (n=164)		MNCs (n=120)	
			Number of items	Cronbach's Alpha	Number of items	Cronbach's Alpha
Career aspiration	25	0.81	25	0.86	25	0.86
Self-efficacy	10	0.64	10	0.87	10	0.93
Organizational socialization	20	0.93	20	0.95	20	0.95
CI practices	30	0.96	30	0.97	30	0.97

Note: CI refers to continuous improvement

## Results and Discussion

Table 2 displays the characteristics of the respondents both in GRIs and MNCs. Results showed that their average age was 38.76, with 25 years as the youngest and 55 years as the oldest in GRIs. This implied that the distribution was towards mid age professionals in GRIs. While in MNCs the average age was 31.26 with a similar age range. This implied the distribution of R&D professionals in MNCs was more towards the younger group of professionals compared to those in the GRIs.

The distribution by gender was about similar, with 52.4% and 55.8% of male respondents in GRIs and MNCs, respectively. More respondents in MNCs were with bachelor's level (78.3%) whereas there was about equal percentage of respondents in GRIs and MNCs with Bachelor's and Master's qualifications. The table also indicates that the majority of respondents both in GRIs (57.9 %) and MNCs (88.3%) have work experience less than 10 years, with the average 12.0 and 6.2 years, respectively. The recent presence of MNCs in the country leads to the differences in age, work experience and level of educational qualification of their R&D professionals compared to those in GRIs.

The correlation results in Table 3 show the highest linear relationship in GRIs was found to exist between career aspiration and CI practices ( $r = 0.35$ ,  $p = .0001$ ). The second highest was between career aspiration and self-efficacy ( $r = 0.33$ ,  $p = .0001$ ). Finally, career aspiration also showed a low positive correlation with organizational socialization ( $r = 0.30$ ,  $p = 0.0001$ ). From the above data, it seems logical to say that career

aspiration is more apt to increase when self-efficacy, organizational and CI practices increase. While in the MNCs, the magnitude of correlation among variables is slightly higher than that in GRIs.

TABLE 2. Profile of the Respondents for GRIs and MNCs

Profile	GRIs (n=164)				MNCs (n=120)			
	Fre- quency	%	M	SD	Fre- quency	%	M	SD
Age group (years)								
< 25	1	0.6	38.76	7.76	12	10	31.26	5.57
26 – 35	66	40.2			85	70.8		
36 – 45	64	39.0			20	16.7		
> 46	33	20.1			3	2.5		
Gender								
Male	86	52.4			67	55.8		
Female	78	47.6			53	44.2		
Educational attainment								
Advanced diploma	3	1.8			2	1.7		
Bachelor's degree	67	40.9			94	78.3		
Master's degree	69	42.1			21	17.5		
PhD	25	15.2			3	2.5		
Work experience (years)								
< 10	95	57.9	12.01	7.63	106	88.3	6.21	4.37
11 – 20	42	25.6			11	9.2		
21 – 30	26	15.9			3	2.5		
>31	1	0.6			0	0.0		

TABLE 3. Correlation Coefficient of Career Aspiration, Self-efficacy, Organizational Socialization and Continuous Improvement Practices for GRIs and MNCs

Variables		GRIs (n=164)				MNCs (n=120)			
		Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>
Y	Career Aspiration								
X <sub>1</sub>	Self-efficacy	0.33**				0.47**			
X <sub>2</sub>	Organizational socialization	0.30**	0.34**			0.38**	0.51**		
X <sub>3</sub>	CI practices	0.35**	0.14*	0.63**		0.46**	0.39**	0.78**	

Note: \*\* Correlation is significant at the 0.01 level (1-tailed).

\* Correlation is significant at the 0.05 level (1-tailed).

CI refers to continuous improvement

Differences in means of variables in GRIs and MNCs are indicated in Table 4. The data show that self-efficacy and organizational socialization show significant differences between R&D professionals in both organizations where self efficacy level for GRIs (M=7.99) was higher than that in MNCs (7.43). Similarly, organizational socialization in the former (M=5.20) is higher than that in the latter (M=4.97).

The multiple regression statistical procedure (stepwise method) was used to predict the independent variables that exert significant influence on the career aspirations of R&D professionals. Two predictor variables were found to be significant in explaining career aspiration of professionals in GRIs and MNCs (Table 5). The variables were self-efficacy ( $X_1$ ), and continuous improvement practices ( $X_3$ ). Organizational socialization ( $X_2$ ) did not yield enough evidence to contribute to the variation in career aspiration of the R&D professionals.

TABLE 4: Differences in means of Variables of GRIs and MNCs

Variable	Organization type	n	M	SD	t	df	Sig. (1-tailed)
Career aspirations	GRI	164	3.66	0.49	1.28	282	.200
	MNC	120	3.59	0.47			
Self-efficacy	GRI	164	7.99	0.86	4.15	195	.000
	MNC	120	7.43	1.27			
Organizational Socialization	GRI	164	5.20	0.93	2.01	282	.046
	MNC	120	4.97	0.99			
CI practices	GRI	164	3.60	0.65	-.28	282	.782
	MNC	120	3.61	0.70			

Note: CI refers to continuous improvement

The  $R^2$  for GRIs is 0.207, with adjusted  $R^2 = 0.192$  which implies that the three predictor variables explain 19.2% of the variance in career aspiration of R&D professionals in the organizations. A similar pattern is observed in MNCs in which the  $R^2$  is 0.32 and adjusted  $R^2 = 0.303$  implying that three predictor variables explain 30.3% of the variance in career aspiration. This is quite a reasonable result for a model with three predictor variables (Cohen & Cohen, 1983). The  $F = 13.90$  for GRIs and  $F = 18.26$  for MNCs are quite large with the corresponding highly significant p-values (0.0001).

Continuous improvement practices had the largest standardized beta coefficient for both organizations. This means that this variable makes the strongest contribution in explaining the career aspirations when the variance explained by all other predictor variables in the analysis is controlled for. The statistics suggest that for GRIs, one standard deviation increase in continuous improvement practices is followed by 0.32 standard deviation increase in career aspirations. The Beta value for self-efficacy was the second highest at 0.29. Organizational socialization has been excluded in this pre-

TABLE 5. Regression Analysis of Career Aspiration for GRIs and MNCs

	GRIs			MNCs		
	Standardized Coefficient Beta	<i>p-value</i>	R <sup>2</sup>	Standardized Coefficient Beta	<i>p-value</i>	R <sup>2</sup>
Constant		0.000			0.000	
Self-efficacy (X <sub>1</sub> )	0.29	0.000		0.38	0.000	
Organizational socialization (X <sub>2</sub> )	-0.01	.969		-0.15	0.251	
CI practices (X <sub>3</sub> )	0.32	0.001		0.44	0.000	
			0.207			0.321

Notes: For GRIs  
R = 0.455; R<sup>2</sup> = 0.207  
Adj. R<sup>2</sup> = 0.192  
F = 13.90, p = 0.0001  
CI refers to continuous improvement

Notes: For MNCs  
R = 0.566; R<sup>2</sup> = 0.321;  
Adj. R<sup>2</sup> = 0.303  
F = 18.26, p = 0.0001

diction analysis for both organizations because of its low Beta coefficient values. This result is supported by the study of Chang, Choi, & Kim (2008) where they found that R&D professionals, who had over seven year's period after their organizational entry, would have high levels of intrinsic values toward leaving the organization (one of the indicators of organizational socialization) and not in terms of their career aspirations. As individuals become deeply familiar with their job and organizational climate they concern less toward socialization but they are more liberated toward their performance and accomplishment instead of their aspirations, which is in line with the term 'saturation factor' introduced by Katz (1997). Based on the results, therefore, all H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub> are partially supported.

## Conclusion and Recommendation

Continuous improvement practices were found to be the strongest predictors of career aspiration in both types of R&D organization, with the magnitude in MNCs higher than that in GRIs. Similarly, self-efficacy was found to be the next important predictor of the respondents' career aspirations. Finally, organizational socialization was not a good predictor of career aspirations. With reference to the framework of this study, it can be concluded that cognitive-person factors (self-efficacy) and behaviour (continuous improvement practices) contributed more than environmental factors (organizational socialization) to the career aspiration of R&D professionals in both types of R&D organization. There was almost similar pattern of the selected variables that significantly contributed to career aspirations of R&D professionals, and the predictive magnitudes of self-efficacy and continuous improvement practices are higher in MNCs than those in GRIs. One possible reason to explain this is that those in MNCs are mostly occupied by the locals with a few exceptions in the executive and directorial levels. However,

due to the different mission and vision of the organizations, in which R&D in MNCs demands higher quality standards to meet global competition and the adjustment of R&D professionals' internal needs with the parent companies' job setting, may explain the differences.

Taking into consideration the R&D environment in Malaysia, continuous improvement practices contributed most in explaining variations in the professionals' career aspiration. Therefore, this study suggests that continuous improvement practices should be considered in the existing model of SCCT behavior variables when considering the R&D settings. This is believed to be a major contribution of the study to the theory. This result also shows that R&D professionals in both organizations are similar in terms of the influence of continuous improvement practices and self-efficacy on their career aspirations. Organizational managers and HRD practitioners in both types of organization, therefore, need to restructure the work practices of R&D professionals by strengthening the quality improvement work-procedures as it significantly affects their career aspirations. Managers and HRD practitioners must also understand why self-efficacy plays an important role in their career-decision. This would help them to formulate new career development programs to develop R&D professionals' cognitive-behavior such as involving them in on-the-job training programs and working in partnership with other R&D personnel from other organizations. This becomes an important practical implication of this study.

Future study is needed to delve into the influence of other variables (that account for the remaining 70% to 80% variance) on their career aspirations for both types of personnel. The use of only three variables becomes a limitation in the study that contributed to only 19.2% and 30.3% variances in career aspirations in the respective GRIs and MNCs. Similarly, there are also career adjustment issues in relation to phases of careers such as growth, stabilization and maintenance of the personnel as well as their career mobility within R&D sector that can be incorporated in the future research. The influence of gender on career aspirations of professionals is another interesting area to work on considering a high number of qualified women going into R&D employment.

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