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Main and Interaction Effects of 'Power Distance' and 'Uncertainty Avoidance' on Innovation in Small and Medium Enterprises in Egypt

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Abstract

The main objective of this study was to investigate the direct and interaction effects of two of Hofstede's cultural metrics, namely power distance and uncertainty avoidance, on organizational innovation in small and medium enterprises in Egypt. A structured questionnaire adapted from a previous study was distributed amongst employees from different managerial levels. 326 completed questionnaires were collected. Results suggested that the national culture influences the level of strategic innovation in small and medium enterprises operating in Egypt. Power distance enhances strategic innovation; however, uncertainty avoidance inhibits it. Studies on Egyptian enterprises, and Egyptian small and medium enterprises are fundamentally underrepresented in previous literature.

Keywords: Hofstede cultural framework, Power distance, uncertainty avoidance, innovation, entrepreneurship, small and medium enterprises, SMEs, Egypt

1. Introduction

Using the Oxford English Dictionary, a clear distinction between the constructs of entrepreneurship, creativity and innovation can be made. Entrepreneurship is defined as "the activity of setting up a business or businesses, taking on financial risks in the hope of profit". Creativity is "the use of imagination or original ideas to create something". Innovation is about "making changes in something established, especially by introducing new methods, ideas, or products or to introduce (something new, especially a product)". In this article, the authors used the construct of innovation, or to innovate, as the focus has been on understanding the underlying assumptions Small and Medium Enterprises (SMEs) in Egypt have, or can use, to foster innovation, in terms of Research and Development and New Product Development to sustain successful performance. Nevertheless, an undeniable part of this process is the creativity of the employees whose innovation is considered the X-factor in any SME (the element with most significant impact) and it is the gateway to global competitiveness (Lee and Peterson, 2000).

In the context of SMEs in Egypt, the ability to strategically innovate is operationalized as the ability to regularly generate new ideas and transform them into marketable products or services. The idea is to leverage all intangible resources (like knowledge and skills) and rely less on the tangible ones such as land, labour and capital (Abraham and Knight, 2001). SMEs provide the perfect setting for these processes to take place, given their relatively smaller sizes compared to larger organisations, and their limited resources. Therefore, the development of their performance is contingent upon the utilization of their intangible abilities. Strategic innovation is based on the inequality between the ambitions of business leaders and their limited resources, this is where limited resources are creatively leveraged (Tse, 2013). Therefore, a knowledge spiral has never been more important in these enterprises!

The national culture is one factor with a significant influence on innovation in SMEs (Mueller and Thomas, 2000). Culture is the system of values, beliefs and expected roles in a society that influences the development of individual innovative traits and subsequent

entrepreneurial behaviors (Mueller and Thomas, 2000). Culture consists of all the values, beliefs and ways to behave that are acceptable in one society, and accordingly, acceptable inside an enterprise. This study built on the notion that culture is a multi-dimensional construct and significantly impacts attitudes, behaviours and outcomes of individuals in any organisational setting. Specifically, this study aimed to empirically validate the positive and negative aspects of culture and their relative impact on innovation.

Based on large scale multinational empirical studies, Hofstede (1983) developed four specific metrics to measure the multi-dimensional construct of culture that later developed into six dimensions. After this seminal research by Hofstede, the cultural constructs have been extensively used in many research studies that showed the impact of culture on almost every aspect of the organisation. While the main effects of these cultural dimensions are studied in detail as influencing factors, there is a relative dearth of research on the effect of the interactions among these dimensions as an influencing factor. Moreover, the interaction between culture and innovation, and their effect on individual and organisational performance, is still considered a gap providing a lucrative field for new studies (Kumar, 2014, Naranjo-Valencia *et al*., 2016). Our study attempted to investigate this gap by studying the direct and interaction effects of two of Hofstede's cultural metrics on enterprise innovation in small and medium enterprises in Egypt.

The article is structured as follows. A brief literature review on innovation and national culture in SMEs is provided. Stemming from the literature review, the research hypotheses are developed, then the data collection and research methodology are presented. Afterwards, the results and discussion sections are provided. The article ends with practical implications and future research suggestions.

2. Literature Review

2.1 SMEs in Egypt

Small and medium-sized enterprises (SMEs) are considered an integral part of the Egyptian economy. These establishments employ around 75% of the workforce (El-Said *et al*., 2014). Thus, it is essential to understand all the factors that make them flourish. In this study, SMEs are chosen according to the number of employees, as shown in Table 1 below (Environmental Quality International, 2005). It seems only fair to argue that SMEs are the future of the country that is undergoing stressful and uncertain economic conditions.

Table 1. SMEs by Number of Employees

Sector	Number of Employees		
	Small	Medium	Large
Trade	5-9	10-19	20+
Service	5-9	10-19	20+
Manufacturing	5-49	50-99	100+
Construction	5-49	50-99	100+
Others	5-49	50-99	100+

Source: "Profile of M/SMEs in Egypt", Ministry of Finance.

SMEs provide the best setting for the growth of creativity and innovation. Nevertheless, in Egypt, they face many hurdles that impede their progress, and sometimes, their inception. On the technical side, one of the major obstacles faced is the lack of information available about these enterprises as well as the lack of information accessible to these enterprises to assist in their growth (Moukhtar, ND). On the financial side, despite the multiple sources of finance available for these enterprises such as the Social Fund for Development (SFD), only 5% of SMEs can benefit from such attempts. This is related to administrative obstacles that they face when trying to apply for funds. Managers of SMEs are obligated to go through the Ministry of Social Affairs, the Ministry of Municipal Development, the Ministry of Finance, the Ministry of Foreign Affairs, NGOs and the Social Fund for Development in order to get anything officially and legally approved (Hampel-Milagrosa *et al.*, 2015, Moukhtar, ND). Accordingly, managers of SMEs rely on intangible resources to strategically innovate (Abraham and Knight, 2001). This calls for learning more about these enterprises and what stimulates their strategic innovation.

Saunila and Ukko (2014) argued that size does not necessarily dictate innovativeness. In other words, the lack of resources in small-size enterprises does not necessarily limit their innovativeness. The same authors identified certain factors that allow one country or region to innovate. These are entrepreneurial characteristics (age, gender, motivation, risk-taking ability), enterprise characteristics (size, sector, location, informality, absorptive capacity), personal and professional networks, and finally the business environment, which is pivotal in determining the organization's ability to upgrade (Saunila and Ukko, 2014). Additionally,

Subrahmanya (2015) found that innovative enterprises are younger in age and entrepreneurial by nature. El Said and El Said (2012) conducted a study on the societal culture in Egypt and found that Egyptians were inclined to minimise power distance in their culture. The same authors suggested that religion and spirituality be added to Hofstede's dimensions due to the recognised importance of religion in some societies, amongst them is the Egyptian society (El Said and El Said, 2012). Although spirituality is implicitly included in Hofstede's indulgence value, focusing on it as a separate value worthy of study is quite relevant to Middle Eastern societies which are homogeneous in nature.

Scholars in different fields argue that the level of entrepreneurship differs between countries, i.e. it differs between cultures (Halkos and Tzeremes, 2013). As stated by Çakar and Ertürk (2010), "Culture has a profound impact on innovation capability of a society or an organization" (p. 328). Accordingly, studying cultures and their effects on the level of entrepreneurship and innovation is of critical value, specifically nowadays in the current unstable and turbulent economic conditions.

2.2 The National Culture and Innovation

Hofstede's cultural framework was used to complete this research. The focus was mainly on the dimensions of power distance and uncertainty avoidance (Minkov and Hofstede, 2011). High power distance refers to how much employees would be willing to accept an unequal distribution of power within a culture; it depicts the nature of the relationship with authority. High uncertainty avoidance is avoiding anything that is unpredictable and being risk averse (Çakar and Ertürk, 2010).

These two dimensions were chosen as Egypt is without a doubt high on both (refer to Figure 1). The authors decided to focus on uncertainty avoidance and power distance as innovation requires risk taking and a short chain of command to succeed and to reap its benefits. Lee and Peterson (2000) argue that certain cultural tendencies lead to having innovative minds. Innovation is the gateway to sustainability, as stated by Jaruzelski *et al*. (2013), companies marked "innovative" spend more than 6% of their revenues on Research and Development.
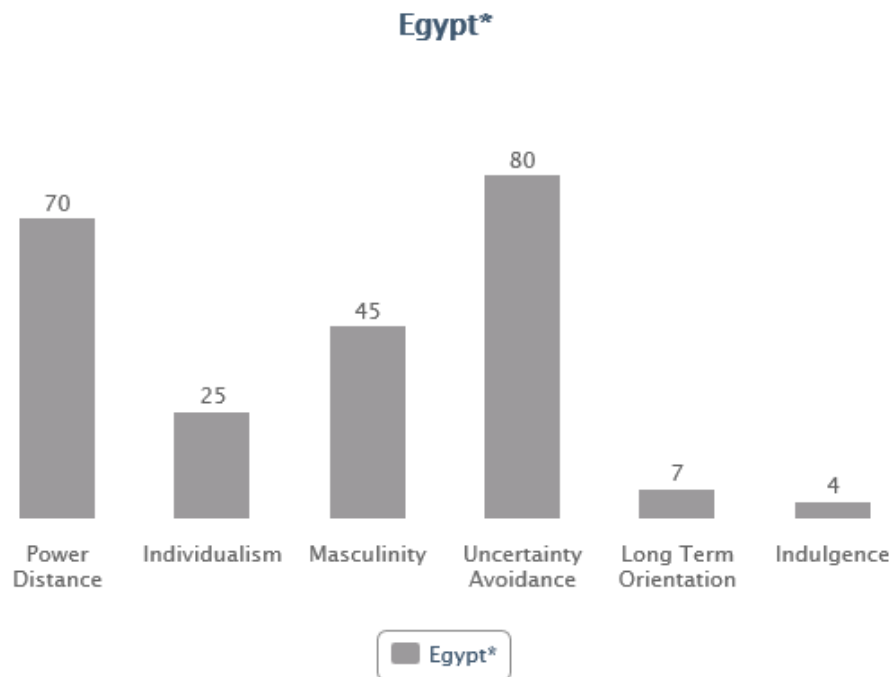
Figure 1. Cultural Dimensions of Egypt (Source: Hofstede et al., 2010)

Hofstede's framework has been used in many studies to explain national innovativeness, cross-national, business-to-business adoption and diffusion (Waarts and van Everdingen, 2005). In addition, previous literature has provided evidence on the effect of culture on SMEs' innovation and performance. Rosenbusch *et al*. (2011) suggested that the organisational culture, age and type of innovation within the enterprise interact and affect the innovation-performance relationship in SMEs (Rosenbusch *et al*., 2011). Saunila and Ukko (2014) stated that a supportive culture in SMEs is crucial to an enterprise's innovation capability, including its *strategic* innovation capability.

The literature has argued that there are different factors which enhance entrepreneurial orientation within an organisation: the organisational structure, leadership and organisational culture (Brettel *et al*., 2015). Using Hofstede's cultural dimensions, Waarts and van Everdingen (2015) were able to support the notion that national culture influences the enterprise's innovation adoption status across several European countries. Countries with high power distance, uncertainty avoidance and masculinity influenced adoption decisions of companies negatively. Vecchi and Brennan (2009) argued that culture-specific arguments can be used to explain innovative performance.

Kumar (2014) provided some empirical generalisations that the scholar claims are common among different settings yet need to be tested. Among them were the negative association between power distance and product development. However, Rhyne *et al*. (2002) investigated the hypothesised negative relationship between power distance and uncertainty avoidance, and new product development in two samples from Belgium and the United States. The relationships were not supported in the American sample. Nevertheless, interestingly, both

hypotheses were rejected in the Belgian sample.

In a sample of Turkish SMEs, the Çakar and Ertürk (2010) found that, on the individual level, power distance was associated significantly, yet weakly, negatively with innovation. In addition, uncertainty avoidance also correlated strongly in the negative direction. However, on the organisational level, only uncertainty avoidance had a strong negative association with innovation (Çakar and Ertürk, 2010). Yuan and Zhou (2015) theoretically investigated power distance and creativity at the group level. They concluded that high power distance, specifically the aspect of status differentiation, bombards creativity.

Vecchi and Brennan (2009) mention that societies which embrace uncertainty tend to exhibit better innovation in performance. Waarts and van Everdingen (2005) argue that organisations in cultures with high uncertainty avoidance are more restricted and confined with rules, and that these enterprises will only attempt to take risks that have already been tried in the market (Waarts and van Everdingen, 2005). Negative associations between uncertainty avoidance and innovation were also supported by Shane (1992 and 1993). Nevertheless, the results are not conclusive with relation to power distance. For instance, Jang *et al*. (2016) argue that the cases of many Asian countries prove the opposite of the conventional relationship. In other words, several Asian countries have made quick economic developments and innovations under autocratic regimes.

Hayton *et al*. (2002) argue that one of the major limitations of studies on culture and innovation is the simple methods used in analysing the data such as neglecting interaction effects between variables that co-vary. The same scholars stated that culture is "a moderator of the relationship between contextual factors and entrepreneurial outcomes… a catalyst rather than a causal agent of entrepreneurial outcomes" (p. 45). In this study, innovation was measured using the dimensions of new product development and Research and Development. Organisational culture was measured using two of Hofstede's metrics, power distance and uncertainty avoidance. Based on previous findings, the following hypotheses were developed.

3. Research Hypotheses

Table two below provides the research hypotheses developed for the study.

Table 2. Research Hypotheses

Research Hypothesis	Research Model
H_1: There is a positive relationship between New Product Development (NPD), and power distance and uncertainty avoidance, individually.	$Model_1$ (Cross Sectional Linear Regression for main effects with no interaction effect on NPD): $NPD_i = b_0 + b_1(Power\ Distance)_i + b_2(Uncertainty\ Avoidance)_i + e_i$
H_2: There is a positive relationship between NPD and power distance and uncertainty avoidance and their interaction.	$Model_2$ (Cross Sectional Linear Regression for main effects with interaction effect on NPD): $NPD_i = b_0 + b_1(Power\ Distance)_i + b_2(Uncertainty\ Avoidance)_i + b_3(Power\ Distance * Uncertainty\ Avoidance)_i + e$
H_3: There is a positive relationship between Research and Development (R&D), and power distance and uncertainty avoidance, individually.	$Model_3$ (Cross Sectional Linear Regression for main effects with no interaction effect on R&D): $R\&D_i = b_0 + b_1(Power\ Distance)_i + b_2(Uncertainty\ Avoidance)_i + e_i$
H_4: There is a positive relationship between R&D and power distance and uncertainty avoidance and their interaction.	$Model_4$ (Cross Sectional Linear Regression for main effects with interaction effect on R&D): $R\&D_i = b_0 + b_1(Power\ Distance)_i + b_2(Uncertainty\ Avoidance)_i + b_3(Power\ Distance * Uncertainty\ Avoidance)_i + e_i$

4. Methodology

4.1 Sample

The study was conducted with participants from the top, middle, and non-managerial levels of SMEs operating in trade, services, manufacturing, construction among other sectors. The sample was drawn from three major SME exhibits located in Greater Cairo, where more than 400 M/SMEs from different sectors showcased and sold their products. A purposive sample of 500 participants were approached, however, only 326 completed responses were viable.

4.2 Variables and Measures

Data were collected through an already existing questionnaire, adapted from Çakar and Ertürk (2010). It consisted of 39 statements that were based on a study measuring the impact of organisational culture and empowerment on strategic innovation in M/SMEs in Turkey. The questionnaire was modified to fit the variables under investigation. Back-to-back translations were done from English to Arabic and vice versa by professional translators. The final version of the questionnaire consisted of 47 statements as additional items on demographics and organisational statuses were added.

Constructs under investigation were measured on a five-point Likert scale where 1 = strongly disagree and 5 = strongly agree. Constructs measured for this study included power distance, and uncertainty avoidance (independent variables), innovation (the dependent variable) was measured using New Product Development (participants were asked about innovations in products in comparison to other enterprises) and Research and Development (in terms of expenditures allocated to innovation).

4.3 Data Collection Procedures

The data were collected through the structured questionnaire distributed to top, middle, and non-managerial levels involved in the sales field from different sectors. Respondents were clearly informed of the purpose of the questionnaire through a cover letter, and confidentiality was assured. The questionnaire was administered by the researchers, and personally distributed to 500 randomly selected respondents in SME exhibits in the Greater Cairo area. 326 responses were used in the data analysis phase for an overall return rate of 65%. Data were analysed statistically using SPSS.

5. Results

The eight items in the survey (Questions 1-8) measured on 1-5 Likert Scale for *power distance* were factor analysed to obtain a composite one factor score for *power distance* for use as an independent variable to explain the variance in enterprise innovation. Likewise, the nine items in the survey (Questions 24-32) measured on 1-5 Likert Scale for *uncertainty avoidance* were factor analysed to obtain a composite one factor score for *uncertainty avoidance* for use as an independent variable to explain the variance in enterprise innovation.

Table 3 shows the bivariate correlations among *new product development*, *research and development*, p*ower distance* and *uncertainty avoidance*. The bi-variate correlation between *new product development* and *research and development* was positive and statistically significant. Further, the bivariate correlations between *power distance* and *new product development* and r*esearch and development* were positive and statistically significant. However, the bivariate correlations between *uncertainty avoidance* and n*ew product development* and *research and development* were negative but statistically significant. Finally, the bivariate correlations between the interaction term *power distance * uncertainty avoidance* and *new product development* and *research and development* were not statistically significant.

Table 3. Bivariate Correlations of Research Variables

		New Product Development	Research & Development	Power Distance	Uncertainty Avoidance	Interaction Term
New Product Development	Pearson Correlation	1	.522**	.283**	-.285**	-.046
	Sig. (2-tailed)		.000	.000	.000	.410
	N	326	326	326	325	325
Research and Development	Pearson Correlation	.522**	1	.176**	-.214**	-.085
	Sig. (2-tailed)	.000		.001	.000	.126
	N	326	326	326	325	325
Power Distance	Pearson Correlation	.283**	.176**	1	-.103	.187**
	Sig. (2-tailed)	.000	.001		.063	.001
	N	326	326	326	325	325
Uncertainty Avoidance	Pearson Correlation	-.285**	-.214**	-.103	1	.324**
	Sig. (2-tailed)	.000	.000	.063		.000
	N	325	325	325	326	325
Interaction Term	Pearson Correlation	-.046	-.085	.187**	.324**	1
	Sig. (2-tailed)	.410	.126	.001	.000	
	N	325	325	325	325	325
**. Correlation is significant at the 0.01 level (2-tailed).						

Based on the correlations reported in Table 3, it is inferred that: 1. *Power distance* positively impacts both *new product development,* and *research and development*, 2. *Uncertainty avoidance* negatively impacts both, *new product development,* and r*esearch and development*, and 3. The interaction between *power distance* and *uncertainty avoidance* does not have any impact on either *new product development* or *research and development*.

Thus, Hypotheses 1 and 3 were supported but Hypotheses 2 and 4 were not supported based on the bi-variate correlations alone. That is, the main effects are significant, but the interaction effects are not significant. The directionality of the impact of *power distance* and *uncertainty avoidance* on strategic innovation was also noteworthy. While *power distance* enhances strategic innovation, *uncertainty avoidance* inhibits it according to the study's sample.

While the correlation matrix in Table 3 reveals bi-variate relationships, Tables 4-7 examine if these revealed bi-variate relationships are significant when multi-variate (regression and ANOVA) analyses are conducted including all independent variables in the research model. Tables 4 and 5 focus on *new product development* as the dependent variable, whereas Tables 6 and 7 focus on *research and development* as the dependent variable.

Table 4 discusses Model 1 that shows the regression with *new product development* as the dependent variable and *power distance* and *uncertainty avoidance* as the independent variables with no interaction term (*power distance * uncertainty avoidance*). The beta coefficients of both *power distance* and *uncertainty avoidance* were statistically significant. The F-statistic was 27.75, which was also statistically significant. Thus, Hypothesis 1 was supported. Examining the size of the standardised beta coefficients, it is also interesting to note that in terms of relative impact on *new product development,* the positive impact of *power distance* was slightly greater than the negative impact of *uncertainty avoidance*.

Table 4. Model 1: Regression with no interaction term

[Dependent Variable = New Product Development]

Model 1	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.87	.05		73.58	.000**
Power Distance	.264	.05	.258	4.994	.000**
Uncertainty Avoidance	-.264	.05	-.258	-4.984	.000**
	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	.383[a]	.147	.142	1.35	

ANOVA[a]					
Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	49.95	2	24.98	27.75	.000**
Residual	289.78	322	.90		
Total	339.73	324			
a. Predictors: (Constant), Uncertainty Avoidance, Power Distance, **significant at the 0.01 level, *significant at the 0.05 level					

Table 5 discusses Model 2 that shows the regression with *new product development* as the dependent variable, with *power distance*, *uncertainty avoidance* and the interaction term (*power distance * uncertainty avoidance*) as the independent variables. The beta coefficients of both *power distance* and *uncertainty avoidance* were statistically significant, but the beta coefficient of the interaction term was not statistically significant. The F-statistic was 18.46, which was also statistically significant. Thus, Hypothesis 2 was not supported.

Table 5. Model 2: Regression with interaction term

[Dependent Variable = New Product Development]

Model 2	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.870	.053		72.994	.000**
Power Distance	.267	.055	.261	4.899	.000**
Uncertainty Avoidance	-.260	.057	-.254	-4.581	.000**
Interaction Term (PD*UA)	-.013	.057	-.012	-.221	.826
	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	.384 [a]	.147	.139	.950	

ANOVA[a]

Model 2	Sum of Squares	df	Mean Square	F	Sig.
Regression	49.99	2	16.66	18.46	.000**
Residual	289.74	321	.90		
Total	339.73	324			

a. Predictors: (Constant), Uncertainty Avoidance, Power Distance, Interaction Term (Power Distance*Uncertainty Avoidance)

**significant at the 0.01 level, *significant at the 0.05 level

Table 6 shows Model 3 and the regression with *research and development* as the dependent variable, and *power distance* and *uncertainty avoidance* as the independent variables with no interaction term (*power distance * uncertainty avoidance*). The beta coefficients of both *power distance* and *uncertainty avoidance* were statistically significant. The F-statistic was 27.75, which was also statistically significant. Thus, Hypothesis 3 was supported. Examining the size of the standardised beta coefficients, it is also interesting to note that in terms of relative impact, the positive impact of *power distance* was much less than the negative impact of *uncertainty avoidance*.

Table 6. Model 3: Regression with no interaction term

[Dependent Variable = Research and Development]

Model 3	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.502	.055		64.244	.000**
Power Distance	.158	.055	.155	2.874	.004**
Uncertainty Avoidance	-.201	.055	-.198	-3.670	.000**
	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	.264 [a]	.070	.064	.9826	

ANOVA[a]					
Model 3	Sum of Squares	df	Mean Square	F	Sig.
Regression	23.326	2	11.663	12.08	.000**
Residual	310.923	322	.966		
Total	334.249	324			

a. Predictors: (Constant), Uncertainty Avoidance, Power Distance,

**significant at the 0.01 level, *significant at the 0.05 level

Table 7 is Model 4 that shows the regression with *research and development* as the dependent variable, and *power distance*, *uncertainty avoidance* and the interaction term (*power distance * uncertainty avoidance*) as the independent variables. The beta coefficients of both *power distance* and *uncertainty avoidance* were statistically significant, but the beta coefficient of the interaction term was not statistically significant. The F-statistic was 18.46, which was also statistically significant. Thus Hypothesis 4 was not supported.

Table 7. Model 4: Regression with interaction term

[Dependent Variable = Research and Development]

Model 4	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.496	.055		63.740	.000**
Power Distance	.156	.055	.168	3.030	.000**
Uncertainty Avoidance	-.137	.055	-.178	-3.081	.000**
Interaction Term (PD*UA)	-.137	.055	-.059	-1.007	.315
	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	.270 [a]	.073	.064	.9826	

ANOVA[a]					
Model 4	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.305	3	8.102	8.391	.000**
Residual	309.944	321	.966		
Total	334.249	324			

a. Predictors: (Constant), Uncertainty Avoidance, Power Distance, Interaction Term (Power Distance*Uncertainty Avoidance)

**significant at the 0.01 level, *significant at the 0.05 level

5. Discussion

The general assumption that culture affects the innovation capability of the organization (Brettel *et al.*, 2015, Waarts and van Everdingen, 2015, Vecchi and Brennan, 2009) was argued for in this article. The empirical results reported above show that while *power distance* enhances strategic innovation, *uncertainty avoidance* inhibits strategic innovation, and that these two cultural constructs do not interact in a significant way to impact strategic innovation. With a deeper reflection, these results have several implications for the management of strategic innovation in SMEs.

Power distance is the degree to which the less powerful employees within an enterprise accept and expect that power is distributed unequally. That is, the greater the *power distance*, the greater is the acceptance of top-down direction by lower-level employees. As most top management teams (C-level managers) aspire for growth of the enterprise and given the general view that strategic innovation generally leads to enterprise growth, it is intuitively appealing to empirically find a positive and statistically significant correlation between *power distance* and strategic innovation. However, these conclusions contradict the norm found in the literature (e.g. Kumar, 2014 and Yuan and Zhou, 2015).

In a similar vein, *uncertainty avoidance* is the degree to which the employees within an enterprise feel uncomfortable with uncertainty and ambiguity. That is, the greater the *uncertainty avoidance*, the lesser would be proclivity for strategic innovation within an enterprise. Given the general view that strategic innovation is generally pregnant with a considerable risk of failure, it is intuitively appealing to empirically find a negative but statistically significant correlation between *uncertainty avoidance* and strategic innovation. The results were in the same direction as in the works of Vecchi and Brennan (2009), Waarts and van Everdingen (2005), and Shane (1993, 1992).

The absence of impact from the interaction between *power distance* and *uncertainty avoidance* also leads to some interesting insights. First, *power distance* and *uncertainty avoidance* work in opposite directions in terms of their main effects on strategic innovation, and hence their interaction, i.e., a combinatorial effect may be nullified by mutual cancellation effects. Second, *power distance* and *uncertainty avoidance* may indeed be independent forces that do not interact much at all, this explanation can be more compelling when one views *power distance* as structural and hierarchical (tall structures in enterprises), whereas *uncertainty avoidance* is more psychological and stems more from within an individual wherever the individual is positioned in the hierarchy. This insight leads to the claim that the interaction effect between *power distance* and *uncertainty avoidance* would/may be statistically significant in enterprises with flatter structures. This idea is an implication for future research.

The relative impacts of *power distance* and *uncertainty avoidance* on strategic innovation are also noteworthy in providing insights for managerial actions. Questions arose including why the negative impact of *uncertainty avoidance* on *research and development is* much stronger than its negative impact on *new product development*. We surmise that this may be because *new product development*, relative to *research and development*, is perceived by respondents to be more exclusive, focussed and tangible than *research and development*. The latter may be perceived to be more inclusive, broad-based and long-term.

6. Research Limitations

This study had several limitations. First, Hofstede's dimensions are not solely sufficient to capture all the heterogeneity in cultures. Other models should be used to capture the multi-dimensionality of cultures. Additionally, the national culture may not accurately reflect individual dispositions. Second, the social institution was examined, however, the system and the industry were not tackled despite their effects. In other words, the economic and

institutional environments were not taken into consideration despite their importance in creating an entrepreneurial sphere. Third, other factors, overlooked here, may affect the results. For example, Çakar and Ertürk (2010) believed that empowerment is the missing link between organisational culture and innovation.

Additional limitations of this study include the lack of an experimental design, and the use of cross-sectional data. Our study results possess limited generalizability due to the non-experimental design (Shadish *et al*., 2002). However, it is impractical to study a cultural phenomenon using experimental design because it is hard to control for the many variables that impact it. Also, Barlett *et al*. (2001) suggest that a large sample size can mitigate the problem of lack of experimental design in research studies.

Cohen (1992) suggested that at significance levels of 0.05 and a power of 0.80, one would need a sample size of 783 respondents to detect a small effect (r=0.10), 85 respondents to detect a medium effect (r=0.30) and 28 respondents to detect a large effect (r=0.50). The large sample size (N=326) makes detecting small effects feasible, this is a real contribution of this study because organisational culture is a complex phenomenon that has too many variables which affect strategic innovation.

Nevertheless, the results should be interpreted with caution. For example, in cultures where *power distance* is low (i.e., more predominance of flatter organisational structures or communal organisations as in socialistic nations), our results may be impertinent. Even in Egypt, with the changing times and globalisation of markets with increased participation of multinational enterprises, the results may not apply to certain organisational contacts. Weinberger [(2012), p. B6-B9] suggests that "all understanding is historical and no human project escapes the characteristics of history-based humanity, fallible, limited, impure of motive, social, and always situated in a culture, a language and a time".

The used research framework covered only two of the cultural constructs of Hofstede (1983), it is possible that the research focus was too limited to address the impact of culture, which the authors admit is a multi-dimensional construct. This limitation can be overcome by other studies that address other dimensions of culture not studied here.

7. Conclusion

This study has empirically investigated the effect of two of Hofstede's metrics, *power distance* and *uncertainty avoidance*, on innovation among SMEs in Egypt. The results showed that high *power distance* inside the enterprise enforces innovation, however, high *uncertainty avoidance* inhibits the innovative capability of the enterprise. In addition, no interaction between both metrics was identified. It is believed that the most important finding of this study is that results are never generalizable. Countries differ in their cultures and their codes of conduct. Hence, researchers must diversify their samples to compare cultures and validate the results of previous researches.

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