

## The effects of physicians' personal characteristics on innovation readiness in Taiwan's hospitals

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**ABSTRACT:** *This paper examines innovation in the healthcare industry in Taiwan. Specifically, we looked at how two critical factors (physicians' creative traits and authoritarian personality) are related to innovation readiness within the medical care system in Taiwan. We argue that innovation readiness is the cognitive precursor to the behaviors supporting innovation. Additionally, we also examine the moderating effects of hospital types (teaching versus non-teaching hospitals) on these relationships. Data from 417 physicians belonging to 26 hospitals is used to test our hypotheses. Results show that the degree of innovation readiness a physician perceives is associated with both creative traits and authoritarian personality. With regard to the organizational variable, the evidence shows that of the specific kind of hospital is far less important than the people who work there when it comes to innovation readiness.*

**KEYWORDS:** authoritarian personality, creative traits, innovation readiness

Innovation continues to get sustained interest from researchers. Such interest is not surprising given the important role played by innovation in any organization's attempt at competitive advantage and survival (e.g., Chen, Damanpour, & Reilly, 2010; Kelm, Narayanan, & Pinches, 1995). In the face of environmental and technological uncertainties, innovation is often seen as a primary source of firm survival and the key to a successful and competitive organization (Shane, 2004). Innovation allows companies to introduce new products to successfully face global competition, rapidly changing customer needs, accelerating pace of technological change and increasing pressures for shortened life cycles (Brown & Eisenhardt, 1995). Technological innovations also allow companies to grow through the creation of new markets, brands and even allowing smaller companies to become market leaders (Sood & Tellis, 2005).

Innovation in today's turbulent environment is the key to a successful, competitive and sustainable organization. It is equally critical in healthcare

organizations in order to benefit patients and to provide high quality of medical service (Kaluzny & Hernandez, 1983). In the medical industry, readiness for change is particularly critical to everyone including patients, nurses, physicians and all staff. Among all different types of readiness, innovation readiness, due to its enormous impact on the profitability and growth of an organization (Zerfass, 2005), is especially important in the face of environmental and technological uncertainties. However, investigations of innovation readiness which is also seen as a critical precursor to acceptance of innovations (O'Connor & Fiol, 2006) remains scarce.

Previous evidence from healthcare organizations has shown that organizational readiness can be linked to patients' benefits as well as the value of the practice change to nurses and physicians (Gale & Schaffer, 2009; Weiner, Amick, & Lee, 2008). This study therefore examines how physicians' personal characteristics are related to innovation readiness. Snyder-Halpern (1998) sees 'innovation readiness' as an important and complex assessment process which is able to guide the organization through the stages of innovation

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implementation, and a characteristic that will have an impact on innovation outcomes.

Our study is motivated by several gaps in the literature. Firstly, most studies regarding to innovation readiness have emphasized the importance of readiness for organizational success without specifying the source of factors of innovation readiness (e.g., Bess, Perkins, & McCown, 2011; Holtkamp, 2003). The majority of such studies have focused on macro factors such as organizational structure and human resource system (Kaluzny & Hernandez, 1983) or tended to emphasize organizational or industry factors at the expense of more individual factors (e.g., Chen et al., 2010; Cho & Mathiassen, 2008; Wainwright & Waring, 2007). However, despite this focus on such contextual factors, it is well accepted that physicians' acceptance of innovative practices is also critical to ensure success of such practices (Carter, 2008).

A second major gap we noted in the literature is that most innovation studies have been ignored the healthcare sector. For instance, innovation has been studied in industries such as biotechnology (Renko, Carsrud, & Brännback, 2009) or multiple industries (De Brentani, Kleinschmidt, & Salomo, 2010). However, we found few studies examining innovation in the healthcare industry. Understanding healthcare innovation is also very critical (Ghodeswar & Vaidyanathan, 2007), and is very necessary in healthcare organizations in order to benefit patients and to provide high quality of medical service (Kaluzny & Hernandez, 1983; Murdock, 1994; Numata, Oguchi, Yamamoto, Imura, & Kawakami, 2010). Because of the increasing competitiveness within the medical care system worldwide, every hospital needs to innovate by searching for new skills, new methods, and new opportunities to survive in such a competitive environment. Furthermore, Poon et al. (2004) have even noted that acceptance of some forms of innovation in hospitals can actually lead to fewer serious medical errors thus protecting patients. Nevertheless, we also note that the type of innovations varies with departments and professional disciplines, making the study of innovation in healthcare industry a challenging task (Wainwright & Waring, 2007). Recognizing

that the traditional understanding of innovation has been suffered from the lack of consistency, the rise of innovation readiness is expected to provide a useful framework for studying innovation in organization (Zerfass, 2005).

Finally, a careful and comprehensive literature review shows that most studies of innovation have been undertaken in Western settings often in the US or Europe (e.g., Renko, Carsrud, & Brännback, 2009) or even in transitioning economies such as Croatia (Radas & Bozic, 2009). Absent are investigations in other locales such as Asia. Given the pace of globalization and the need to understand other cultural settings, we focus our study on hospitals in Taiwan.

Previous evidence from healthcare organizations has shown that organizational readiness can be linked to patients' benefits as well as the value of the practice change to nurses and physicians (Gale & Schaffer, 2009; Weiner et al., 2008). Among all different types of readiness, innovation readiness, due to its enormous impact on the profitability and growth of an organization (Zerfass, 2005), is especially critical in the face of environmental and technological uncertainties.

Given the above gaps, we contribute to the literature by examining both individual and organizational factors on physicians' innovation readiness. Consideration of both individual and organizational factors allow us to contribute to a more complete and comprehensive understanding of innovation readiness in hospitals. Hence, we consider two individual factors that have been mostly ignored by previous literature. We choose to focus on creative traits and authoritarian personality as two main personal characteristics for two reasons: (1) Peoples' creative traits are one of the most direct ways to look into individual differences in terms of creative performance because of its salient link toward the generation of creativity (Amabile & Fisher, 2009) which is considered as a necessary precursor for innovation (Amabile, 1982; Amabile & Fisher, 2009); and (2) Due to physicians' expertise and importance to patients, they are usually highly respected by the public and thus an authoritarian personality can be easily formed (Kuper & Kuper, 1985). While there are other individual factors, we argue that these two

characteristics are most important in evaluating a physician's innovation readiness.

Moreover, with regard to the possible influence of organizational factors on innovation (Cohn & Turyn, 1980; Hage & Aiken, 1970), the moderating effect of different types of hospitals in Taiwan will be discussed in order to gain a comprehensive understanding of the relationship between physicians' personal characteristics and innovation readiness. In sum, this study aims at addressing the effect of both individual and organizational factors on individuals' perception of innovation readiness. It is believed that by applying innovation readiness into the study, the difficulty of measuring various types of innovation in hospitals can be avoided. Meanwhile, by understanding the source of innovation readiness, it is more likely to achieve success for healthcare organizations.

## THEORETICAL FRAMEWORK AND HYPOTHESES

### Innovation readiness

Innovation readiness is often seen as the cognitive precursor to the behaviors of either resistance to, or support for, an effort toward change. We, therefore, define innovation readiness as organizational members' beliefs, attitudes, and intentions regarding the extent to which innovation are needed and the organization's capacity to successfully make those innovation changes (Armenakis, Harris, & Mossholder, 1993). It is the organizational members' perceptions of the degree of preparedness in terms of innovation practices or activities within an organization. Several researchers also suggested that readiness includes psychological factors that individuals sense the need of change and hold key beliefs in changes (e.g., Armenakis & Harris, 2009; Kotter & Schlesinger, 2008). When readiness is described in psychological terms, it is reasonable to refer it as an individual-level construct (Weiner et al., 2008).

According to judgment analysis theory (JAN), the way individuals identify and evaluate the contextual cues to form a judgment in terms of innovation can be referred to as innovation readiness. That is to say, innovation readiness is an individual-level concept that is one's perception toward his/her own understanding of ongoing change (Snyder-Halpern, 1998). Innovation

readiness is thus associated with how individuals identify and assess contextual cues around them and refers to one kind of judgment process for the purpose of clear guidance and sound decision making, leading to successful triumphant innovations (Snyder-Halpern, 1998). In addition, considering from organizational change, particularly in medical organizations, Snyder-Halpern (1996) pointed out that 'innovation readiness' refers to people's self-cognitive awareness with regard to whether organizations are ready to implement innovation or whether organizations are possessed with the ability to innovate and are qualified for it. As Jennett, Gagnon, and Brandstadt (2005) noted, 'readiness for change is an integral and preliminary step in the successful adoption of innovation', and every member could have different level of innovation readiness regarding to their own organization.

### Creative traits and innovation readiness

Creative traits have been recognized as important indicators for the generation of creativity (Amabile, 1982; Kurtzberg & Amabile, 2001; Oldham & Cummings, 1996; Sternberg & Lubart, 1993). Creative people are more likely to have new ideas and are willing to implement them (Miron, Erez, & Naveh, 2004).

Creative traits are also correlated to innovation. Barron and Harrington (1981) considered high energy, autonomy, attraction to complexity and independence of judgment as characteristics of creative personality; and these traits have been shown to correlate with innovation. Similarly, Slappendel (1996) also showed that the source of innovation comes from individual originality, and especially that those individuals who are not satisfied with the current organizational status or conditions are more likely to accept innovation. Kurtzberg and Amabile (2001) concluded that the cognition process toward creative thinking, personality of the creative thinker is one of the important factors that could affect innovation. As Greenhalgh, Robert, MacFarlane, Bate, and Kyriakidou (2004) pointed out from their study of previous cognitive and social psychology literature, one's creative traits are indeed easily linked to the propensity to try out and use innovations. Furthermore, innovation readiness is a continuous process which directs

creativity toward innovation and is regarded as the indicator to successful innovation, and it is thus reasonable to argue that there is a positive linkage between creative traits and innovation readiness.

Hypothesis 1: High creative traits of physicians will be positively related to innovation readiness.

### **Authoritarian personality**

The definition of an authoritarian personality is a 'threat-oriented, defensive individual who copes with threats by conventionality and obedience and who shows hostility toward weaker members of out groups' (Stone, Lederer, & Christie, 1993). Physicians are one of the most significant members of staff in medical care systems. Due to the physicians' expertise and importance to patients, they are usually highly respected by the public and an authoritarian personality can be easily formed (Kuper & Kuper, 1985).

The study of Kuper and Kuper (1985) demonstrates that both physicians' positions as well as their expertise contribute to form their authoritarian personality. Physicians are frequently involved in critical decision making processes including with regard to the innovative policies of hospitals. In fact, Kaluzny and Hernandez (1983) mentioned that most innovations within a health service organization involved mainly physicians and patients, and physicians are always trained to make decisions and solve problems in an authoritative manner. More specifically, Hage and Dewar (1973) inferred that the elite values in predicting innovation apt to happen in the hospital setting where highly skilled professionals such as physicians are elite members who form the value climate. As a result, physicians' judgments regarding to innovation readiness is believed to have a major influence on their commitment to support those innovative activities. Therefore, understanding of physicians' authoritarian personality and innovation readiness is critical.

We argue that authoritarian personality and innovation readiness are negatively related. When combining an authoritarian personality with a position of real power, physicians may find it difficult to accept others' advices, especially those from lower positions, and may even threaten or be hostile to those lower in the hierarchy (Lin, 1990;

Maslow, 1943). Due to the nature of tasks and personnel in hospitals, physicians are more likely to treat changes or problems in an authoritarian manner enabling them to dominate the proposed strategies or innovation. In sum, physicians with a more authoritarian personality are less likely to be tolerant of divergent opinions, and more likely to neglect their sense of surroundings, possibly leading to lower degrees of innovation readiness.

Therefore,

Hypothesis 2: High authoritarian personality of physicians will be negatively related to innovation readiness.

### **Moderating effect of type of hospitals**

Hospitals are typically concerned about organizational innovation factors including organizational structure and human resource systems (Kaluzny & Hernandez, 1983). With regard to organizational level, the type of hospital a physician works in might influence the relationship between personal characteristics and innovation readiness.

According to judgment analysis (JAN), it is believed that individuals form a judgment about some criterion event, i.e., innovation readiness, based on how they identify and weigh contextual cues, for example, types of hospitals (Cooksey, 1996). Hikmet, Anol, Menachemi, Kayhan, and Brooks (2008) showed that the hospital size, system membership, as well as tax status are related to the adoption of healthcare information technologies. Holt and Vardaman (2010) also pointed out the impact of other structural factors on readiness and further indicated that both individual and organizational level factors are likely to occur simultaneously and ultimately have an effect on individuals' perception of innovation readiness. Several other researchers (see Ghodeswar & Vaidyanathan, 2007) have also argued the importance of organizational characteristics and their interactions with individuals when it comes to the innovation in healthcare sector.

In Taiwan, hospitals range from huge teaching hospitals to small clinics. A large hospital is one of the most complicated organization with many business units. A large hospital can hire many different types of staff members and operates thousands of machines and other medical equipment. A critical categorization that thus is likely to have

an impact upon the innovation readiness of physicians is teaching versus non-teaching hospitals.

In Taiwan only medical centers and regional hospitals are qualified as teaching hospitals in terms of the scale and the size of organizations. Furthermore, being teaching hospitals means they are more likely to obtain abundant resources, such as funding, staff, and so on. We argued that physicians in teaching hospitals should perceive higher innovation readiness since they enjoy and handle more resources than those in non-teaching hospitals.

Previous research which investigated how organization structures influence innovation often considered complexity, centralization and formality as the three distinguishing characteristics of organizational structures (Hage & Aiken, 1970; Kimberly & Evanisko, 1981; Sciulli, 1998). Hage and Aiken (1967) indicated that high complexity, low formality and low centralization can often contribute to organizational innovation. Cohn and Turyn (1980) further explained the reasons why high complexity facilitates innovation. First, the complexity of expertise can bring creative ideas. Secondly, professions or experts can obtain reputation or better work performance by implementing innovation throughout their fields. Low centralization is also helpful for innovation because extensive involvement in innovative strategies can establish work vision and be conducive to information sharing. The obstructions to innovation implementation can thus be avoided through the involvement of organization members or through the assistance of lower-level managers (Cohn & Turyn, 1980). Low formality encourages managers to look for better approaches to accomplish their work assignments, instead of confining managers within strict norms or restrictions (Cohn & Turyn, 1980).

Based on the above, we believe that because of the differences in size, function, and structure of teaching and non-teaching hospitals in Taiwan, the relationship between physicians' personal characteristics and innovation readiness might also differ. Accordingly, it is assumed that physicians in teaching hospitals should have higher innovation readiness than those in non-teaching hospitals. Physicians in teaching hospitals are more likely to have access to resources and the staff to implement

innovative ideas. Furthermore, the structure should also be more conducive to innovation. We therefore believe that such condition should be related to higher innovation readiness. Thus,

Hypothesis 3a: The relationship between physicians' creative traits and innovation readiness will be moderated by the type of hospital such that the relationship between physicians' creative traits and innovation readiness will be stronger when they work in teaching hospitals.

Hypothesis 3b: The relationship between physicians' authoritarian personality and innovation readiness will be moderated by the type of hospital such that the relationship between physicians' authoritarian personality and innovation readiness will be stronger when they work in teaching hospitals.

## METHODS

### Participants and procedures

Seventy-eight hospitals geographically distributed over Taiwan were invited to participate in this study. Simple random sampling was adopted and we assigned several well-trained graduate students to different hospitals with a large number of questionnaires. They stayed in the lobby, cafeteria or coffee shops in hospitals and invited physicians to answer the questionnaires during their spare time there. Once finished, the questionnaires were collected right away. Thus, the sample of physicians in our study was randomly selected, regardless of gender, age, education, tenure and position.

The final usable sample consisted of 417 physicians from 26 hospitals – 124 physicians from 12 teaching hospitals (three of them are public-owned) and 293 physicians from 14 non-teaching hospitals (two of them are public-owned). The number of physicians per hospital ranged from 5 to 91 ( $\bar{x} = 16.04$ ). Eighty-one percent of the physicians in the final sample were male, 83% had bachelor degree, and 41% were attending physicians; the average age was 37 years old, and the average tenure was 7 years (See Table 1).

### Measures

This study used questionnaire surveys, exploring physicians' authoritarian personality, creative traits, and innovation readiness. In addition, we also asked physicians to provide their basic

**TABLE 1: MEANS, STANDARD DEVIATIONS, AND CORRELATIONS (N = 417)<sup>a</sup>**

Variables	Mean	SD	1	2	3	4	5	6
1. Education <sup>b</sup>	1.200	0.468						
2. Position <sup>c</sup>	3.300	1.215	0.294**					
3. Age <sup>d</sup>	2.080	0.824	0.378**	0.697**				
4. Creative traits	2.345	3.795	0.044	0.011	0.024			
5. Authoritarian personality	2.879	0.346	0.096	0.222**	0.183**	-0.119*		
6. Type of hospital <sup>e</sup>	1.300	0.458	-0.026	0.245**	0.123*	-0.001	0.133**	
7. Innovation readiness	3.468	0.585	0.164**	0.131**	0.127**	0.227**	0.174**	-0.036

<sup>a</sup>Total number of the samples (N) = 417; <sup>b</sup>education: 1 = bachelor degree; 2 = master degree; 3 = PhD degree; <sup>c</sup>position: 1 = intern; 2 = resident physician; 3 = chief resident; 4 = attending physician; 5 = chief of attending physician; <sup>d</sup>age: 1 = under 30; 2 = 31–40; 3 = 41–50; 4 = above 50; <sup>e</sup>Type of hospital: 1 = teaching hospital; 2 = non-teaching hospital; \*\*correlation is significant at the 0.01 level (2-tailed); \*correlation is significant at the 0.05 level (2-tailed).

information, such as gender, age, tenure, position, education, and the name of hospital. We then integrated these into our questionnaire. Each scale was translated from English to Chinese and later reverse translated from Chinese to English to test its validity.

### ***Creative traits***

As for testing physicians' creative traits, we applied the Creativity Personality Scale (CPS) developed by Gough (1979), which been used and approved by many researchers (Domino, 1994; Kaduson & Schaefer, 1991; McCrae, 1987; Oldham & Cummings, 1996). In this scale, there are 30 terms describing personality, 18 of which are positively related to creativity while the rest of 12 are negatively related to creativity. Physicians would get 1 for each of 18 positive items or get 0 by not selecting them. On the other hand, they would get -1 for each of 12 negative items and still get 0 by selecting none of them. In sum, a higher score means the individual is more creative (Cronbach's alpha = 0.61).

### ***Authoritarian personality***

To investigate physician's authoritarian personality, Altemeyer's (1996) latest version of the Right-Wing Authoritarianism Scale was used. Participants respond to 30 questions on a 5-point Likert-type scale anchored at one (strongly

disagree), three (neutral) and five (strongly agree). Sample items include: 'Our country will be destroyed someday if we do not smash the perversions eating away at our moral fiber and traditional beliefs' and 'It is important to fully protect the rights of radicals and deviants.' Three attitudinal clusters, conven-

tionalism, authoritarian submission and authoritarian aggression, tested whether the physicians had an authoritarian personality or not. A higher score represents a more authoritarian personality (Cronbach's alpha = 0.74).

### ***Innovation readiness***

Snyder-Halper's Innovation Readiness Scale (IRS), proposed in 1998, was applied to test innovation readiness. This scale was originally designed to test the innovation readiness of nurses, who work in the similar domain as our research subject, physicians. Although the IRS was first aimed at measuring the innovation readiness regarding to nursing research program, there is no need to limit its application to other types of innovation. In fact, most of innovation implementing in healthcare organizations is technology-related. Especially in Taiwan, with the help of well-built IT system, innovative activities including technology, product, and process innovation in hospitals are easily to be observed. Hence, we used IRS with 16 questions and asked participants to respond on a 5-point Likert-type scale, from one (strongly disagree) to five (strongly agree), to investigate staff readiness (six items), environmental readiness (six items) and resource readiness (four items). Questions for staff readiness include: 'there is encouragement of faculty and student research'; for environmental readiness, questions include: 'there is support for development of a climate that fosters

professional practice'; and for resource readiness, questions include: 'a variety of research consultation services are readily available'. The higher scores represent that an organization is more supportive and ready for organization innovation (Cronbach's alpha = 0.94).

### **Organizational level factor**

Recognizing the potential influence of organizational factor on innovation readiness, the type of hospital has taken into account. We dichotomized the hospital variable into teaching and non-teaching facilities.

### **Control variables**

We assessed age, education, and position as control variables because they were expected to have potential effects on individuals' characteristics and has been demonstrated in past research.

### **RESULTS**

Table 1 provides the means, standard deviations, and correlations of the variables. As it is shown in Table 1, we find that education (0.164), position (0.131), age (0.127), creative traits (0.227), authoritarian personality (0.174) all are significantly positively related to innovation readiness, except for type of hospitals which is negatively and non-significantly related to innovation readiness.

To test hypotheses, we employed hierarchical regression analysis according to the procedure delineated in Cohen and Cohen (1983) that included (1) Three control variables; (2) Two independent variables and one moderator; and (3) The interaction between independent variables and moderators in this study. Table 2 presents the results of the analyses.

Hypothesis 1 predicts physicians' creative traits will be positively related to innovation readiness.

**TABLE 2: RESULTS OF HIERARCHICAL REGRESSION ANALYSES FOR INNOVATION READINESS<sup>A</sup> (N = 417)**

Variables	Model 1	Model 2	Model 3	Model 4
1. Education	0.139*	0.117*	0.117*	0.117*
2. Position	0.088	0.074	0.074	0.077
3. Age	0.018	0.013	0.013	0.009
4. Creative traits		0.226**	0.226**	0.126
5. Authoritarian personality		0.178**	0.178**	0.215*
6. Type of hospital			-0.066	-0.232
7. Creative traits × type				0.126
8. Authoritarian personality × type				-0.207
R <sup>2</sup>	0.038	0.106	0.110	0.115
F	5.141**	9.124**	7.905**	6.197**
ΔR		0.068	0.004	0.005
FΔR		14.559**	1.719	1.067

<sup>a</sup>Standardized coefficients are reported; \* $p < 0.05$ ; \*\* $p < 0.01$ .

On the other hand, Hypothesis 2 states that physicians' authoritarian personality is negatively related to innovation readiness. Results from Table 2 provide support for Hypothesis 1 while rejecting Hypothesis 2. The data indicates that creative traits have a positive relationship with innovation readiness (0.227). Surprisingly, it also shows that authoritarian personality has a positively relationship with innovation readiness (0.174). Namely, physicians who have stronger authoritarian personality have higher degrees of innovation readiness.

Hypothesis 3 treats type of hospital as a moderator between physicians' personal characteristics and innovation readiness. Results from Table 2 reject Hypothesis 3. Type of hospitals has neither a significant influence on innovation readiness (-0.066) nor moderates the relationship between physicians' individual characteristics and innovation readiness ( $\Delta R = 0.005$ ,  $p > 0.05$ ) as we expected. Type of hospitals (-0.066) seems have no influence on the relationship between physicians' individual characteristics and innovation readiness.

### **DISCUSSION**

Our findings demonstrate that physicians with more obvious creative traits, also show a higher level of innovation readiness. These physicians are more willing to try new things and take risks

and are less afraid of new challenges and changes. It is also possible that physicians with creative traits are very sensitive to organizational support. Even if the actual level of support is very low, they believe the hospital they work for is already prepared and ready for innovation, thus, for those with creative traits tend to score higher for the innovation readiness.

This research also showed that the authoritarian personality of physicians is positively related to the degree of innovation readiness. That is, when the physicians have stronger authoritarian personality, they have a higher level of innovation readiness. This result is in contrast to Adorno's (1950) research, which describes the authoritarian personality as anti-science and conventional. Based on that, it would be expected to see a negative relationship with innovation readiness, as such individuals would obey and accept authority and thus resist new things or ideas.

Despite surprising findings, there is a plausible approach regarding authoritarian personality and innovation readiness. Once authority is treated as a formal and unique form of power, the need for power can be recognized as justifiable and proper (Winter, 1973). According to Fodor and Greenier (1995), people with an intense need for power have a special tendency for innovation. Barron (1969), Cattell (1971), Helson (1971, 1980, 1985), and MacKinnon (1964) also agreed that need for power has a significant influence on innovation. Accordingly, people with an authoritarian personality would like to consolidate and strengthen their power and position, which in turn stimulates their need for power and achievement. Since the need for power and achievement are positively related to creativity and innovation, it seems reasonable to suggest an implicit relationship between an authoritarian personality and innovation readiness.

Based on our findings, we tend to believe that physicians' authority is established by the professions, and therefore, they must maintain their authority by treating patients well, which relies on continuously acquiring new information, since the healthcare industry is improving everyday and many conditions can only be treated or cured by new skills, medication, and

equipments. Consequently, if the physicians do not continuously learn and innovate, they might be considered as old-fashioned and lose their reputation, and hence the source of their authority. In short, we believe that the reason why there is a positive relationship between physicians' authoritarian personality and innovation readiness is probably because physicians can gain their patients' and colleagues' trust, respect and identification by obtaining the latest medical knowledge and being innovative.

In sum our findings show that both creative traits and authoritarian personality have significant influence on innovation readiness. In other words, personal factors are indeed related to innovation readiness. The creative traits inherent in physicians, and also the authoritarian personality they obtain from learning and cognition, both have a positive influence on innovation readiness. Therefore, even though physicians are in different hospital settings, their individual creative traits and authoritarian personality have influence on the innovation readiness.

Surprisingly, there was no evidence to show that the relationship between physicians' personal characteristics and innovation readiness differs with the type of hospital they work in. While previous researchers indicated that organization characteristics are important factors influencing innovation (Ghodeswar & Vaidyanathan, 2007; Hikmet et al., 2008; Slappendel, 1996), our research results demonstrated that types of hospitals have no significant moderating effect on physicians' personal characteristics and innovation readiness.

This result could refer to the fact that physicians are 'elites' in the healthcare systems and society. First of all, physicians are the one who are seen as directly responsible for the well-being of their patients, not the hospital structure. Thus, the influence and importance of physicians are much more significant than the hospital's size, structures or types. Secondly, physicians are professionals with a high-level expertise. Individual ability, skills and knowledge have a strong effect on their performance, while general factors, such as the type of hospital, have less influence on innovation performance. Moreover, elite or leadership



values will form the value climate of organizations (Hage & Dewar, 1973), and thus instead of the hospital types, organization members, i.e., physicians in this study, become the ones who lead innovative climate and values for the organization. While the organization members spontaneously coordinate and accept innovation, the wider characteristics of the organization hardly have any impact on innovation implementation.

### Practical implications

By and large, the results imply the importance of physicians' recruitment and selection when the pursuit of innovation becomes the major focus of hospitals. Since we believe that creative traits are inherent and are positively related to innovation readiness, they could be reasonably considered as the criteria of recruitment and selection. On the other hand, from our perspective, authoritarian personality is no longer treated as negative or detrimental to innovation; rather, we may be willing to provide more support to those in higher places or with better reputation in order to motivate physicians' endeavors to innovation.

In the end, this study provides some useful hints on how to manage innovation in hospitals. It also indicates the significant influence of physicians on innovation is no way to be neglected and thus they deserve more attention and support if the pursuit of innovation is the main goal for hospitals.

### CONCLUSION AND FURTHER RECOMMENDATIONS

The most critical finding of this study is that authoritarian personality of physicians has a significant positive, instead of negative, influence on innovation readiness, which is opposite to our original hypothesis. One of the explanations lies in the unique subject we observed – physicians. It is an occupation that requires highly creative and innovative ability to apply state-of-the-art therapy or treatment in order to take care of patients. In addition, due to their professional knowledge and skills, it is also an occupation with highly respected social status. In other words, physicians build their authority and power based on their accumulated knowledge, ability, and skills, which in turns, benefit from the pursuit of innovation. Without continuous efforts to innovate, physicians are unlikely

to earn respect. In short, physicians must rely on creative and innovative endeavors to establish their authority toward patients, the public, other physicians and nurses. As a result, it is no surprise to learn that physicians' authoritarian personality is positively related to innovation readiness.

With regard to the role of types of hospitals, the lack of a significant impact between physicians' personal characteristics and innovation readiness indeed gave us little surprise at first. The definition of innovation readiness implies not only individual but also organizational factors would affect the perception of whether people are ready for innovation. Nevertheless, our finding reveals that only physicians' personal characteristics matter. Again, we believe it is due to the distinguishing feature of being physicians. No matter what kinds of hospital a physician works in, the need for innovation stays the same. Therefore, is of importance is not the types of hospitals, but the physicians themselves.

The pressure of the healthcare industry in Taiwan to become more cost effective and sustain competitive advantage under uncertain environment will stay strong. Results of our study have provided solid evidence showing that physicians – the elites in healthcare industry – could and should play a prominent role in leading innovations in hospitals. In fact, the success of innovation capabilities in Taiwan has mostly been attributed to the support of the government in the past (Breznitz, 2007). Taiwan's government used to employ more top-down policy instruments to support target industries for the pursuit of successful innovation (Lin, Chang, & Shen, 2010). Especially in the healthcare industry in the past few decades, it has been a regular occurrence to see research of state-of-the-art skills and studies are encouraged and strongly promoted by the government. For example, abundant government research funding and grant, along with other resources like latest equipment and medical devices and so on are mainly provided by the government. But this approach apparently has reached its limit. Accordingly, it is suggested that it is time for the leaders and elites in lieu of the government to come forward and to lead the next wave of innovation.

Such findings suggest that the typical top-down governmental approach to innovation in

Taiwanese hospitals should be minimized. Rather than forcing adoption of new technology on physicians, the Taiwanese government should enact policies to take advantage of the willingness of creative physicians to adopt new technologies. Physicians are the one who practice in the field and they may be more aware of solutions to ongoing problems in the healthcare industry. By implementing policies to incorporate physicians' ideas and solutions to make the sector more innovative, the government will be able to take advantage of the physicians' readiness to innovate.

In addition to the above recommendations, our findings suggest some avenues for future research. Further research is still needed to examine more individual as well as organizational attributes associated with innovation readiness. For example, different types of designation organizational characteristics and top management support, etc., should be adopted and tested to observe whether there are any other attributes that are related to innovation readiness. Furthermore, there might be also another issue in terms of cultural difference with regard to the relationship between physicians' characteristics and innovation readiness. As mentioned before, being a physician in Taiwan, or under Eastern culture environment, seems to be recognized as a fairly high-ranking occupation and could earn lots of respect merely because of the title of 'doctor'. Whether this phenomenon stays the same in the western world, and whether a similar result will be found among other, similar occupation, where innovation is key to maintaining authority, remains unknown.

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