自發性與創意行為之探索性研究

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摘　要

本研究旨在檢驗自發性與創意行為之間的關係。研究問卷發放之對象為兩所大學的大學部與碩士班學生，問卷內容包含自發性量表、與柯龍優異人格量表，本研究最後收集之有效樣本共計 491 份。為達上述研究目的，研究者利用獨立樣本 t 檢定、驗證式因素分析與結構方程模型等分析方法考驗研究假設。研究結果發現，自發性有五個因素：自由、愉悅、有信心、愛、活力，能夠預測創意行為。在「自信」方面，男性的分數顯著地大於女性。男性的 KAI 分數也顯著地大於女性。創新者在「自由」、「愉悅」、「有信心」、「愛」與「活力」的分數都顯著地大於適應者。結構方程模式的結果顯示，自發性顯著地預測 KAI，進而顯著地預測原創、效率與遵從。此模式解釋 KAI 57%的變異量，原創 90%的變異量，效率 64%的變異量，及遵從 45%的變異量。文末，研究者歸納結論，並提出研究結果之應用及未來研究建議，作為後續研究者之參考。

關鍵詞：自發性、創意、創意行為

INTRODUCTION

The importance of innovation has been consistently emphasized in today's organizations. For example, studies showed that innovation plays a significant role in the creation of a competitive advantage (Cooper, 1998; Janssen, 2005; Kleysen & Street, 2001). To adapt to the changeable and competitive environment, organizations need to be dynamic and innovative to stay competitive (Xerri, Brunetto & Shacklock, 2009). In addition, Ardts, Van Der Velde, and Maurer (2010) noted that innovative behavior is the process of bringing problem-solving ideas into use. Further, some researchers described innovative behavior as a process of recognizing a problem, producing solutions, and embedding the solutions into organizational practices (Stashevsky, Burke, Carmeli, Meitar, & Weisberg, 2006). Therefore, innovation becomes imperative to the improvement of organizational process efficiency.

Innovation goes hand in hand with creativity; it involves formulating new ideas and thinking "out of the box." Without innovative action, mankind would not progress. According to Addis (2009), creativity is the act of generating fresh ideas, actions or strategies; yet innovation is a new way of looking at and changing them. More precisely, creativity is the capability of conceiving something unique and original, whereas innovation is the implementation of creative ideas.

Innovativeness and creativity are correlated not only with economic success, but with particular advances in knowledge of education, science, and psychology, which enhance the human health and welfare (West & Altink, 1996). Nevertheless, the research on innovation has been viewed as the domain of economics rather than human behavior. Although the study of innovation has expanded from the communications and administrative science to psychology and sociology, this expansion has been slow (West & Altink, 1996).

Creativity is not only the problem of the universe, but the problem of psychology and human relations as well (Moreno, 1955a). In the psychological field, Moreno (1953) asserted that spontaneity leads to creativity. As defined by Moreno (1955a), spontaneity is an energy flow and a state of readiness to respond as required. While creativity is

related to the act itself, spontaneity partly results from the warming-up process. In other words, creativity is the arch substance, and the arch catalyzer of creativity is spontaneity (Moreno, 1955a). If an individual lacks spontaneity, this will restrain him or her from having an adequate response to a new situation or a novel response to an old situation (Moreno, 1953). Hence, creative behavior needs spontaneity.

This study aims to examine the relationship between spontaneity and innovative behavior. Additionally, the researcher intends to investigate the spontaneity factors leading to creative action. Lastly, it is expected that this paper can offer implications to those innovation-oriented organizations and counselors in the related field.

LITERATURE REVIEW

Creativity and Innovation

The terms creativity and innovation are often used interchangeably in research studies, and the distinction between the two concepts may be more one of emphasis than of substance (West & Farr, 1990). Nevertheless, some agreement about the terms' definitions has come up recently; creativity has to do with the generation of fresh and novel ideas (Mumford & Gustafson, 1988), whereas innovation has to do with the adoption of useful ideas and implementation of the results of creativity (Kanter, 2000; Van de Ven, 1986). In the following subsection, the researcher will provide an overview of the literature related to innovation.

Innovation is a broad construct that has been defined differently by various researchers over time (Goldsmith, 1986). Typically, the construct has been conceptualized in terms of individual behaviors, characteristics, and traits (Kleysen & Street, 2001). For example, Hurt, Joseph, and Cook (1977) construed individual innovativeness as a personality trait characterized by a willingness to change. Similarly, Jackson (1976) considered an innovator to be "a creative and inventive individual, capable of originality of thought; motivated to develop novel solutions to problems; values new ideas; likes to improvise" (p. 10).

In this day and age, innovation is not only the "creation of something new" but also "a panacea for the solution of problems" (Kotsemir, Abroskin, & Meissner, 2013). As Kirton (1976) suggested in his theory of adaption-innovation, there are two styles of creativity and problem solving, namely adaptors and innovators. Adaptors tend to "do things better," while innovators prefer to "do things differently". More specifically, adaptors are inclined to create change by incremental improvement within the existing system or paradigm (Kwang & Rodrigues, 2002). They tackle problems in a predictable, disciplined, and methodical way (Ee, Seng, & Kwang, 2007). In contrast, innovators are undisciplined and approach tasks from unsuspected angles (Kirton, 1976). Unlike adaptors, they tend to take control in unstructured situations, discover avenues of solution, and often put forward novel ideas at a time, known colloquially as "thinking out of the box" (Kirton, 1976; Kwang & Rodrigues, 2002).

In economic and social spheres, Zhuang, Williamson, and Carter (1999) characterized an innovation as either: an invention which may be considered completely new; an improvement of an existing product or system; or a diffusion of an existing innovation into a new application. Furthermore, Robertson (1967, p. 14) described innovation as a process where *a new idea, behavior, or thing, which is qualitatively different from existing forms, is implemented* and transformed into implementable products and services.

With the definition above, it can be seen that innovation appears as both a process and a product/outcome. Indeed, in the fields of economics and management, some researchers have classified innovation into two categories: (a) product innovations: the introduction of new products and services or an improvement of the performance of the existing products (Gopalakrishnan & Damanpour, 1997), and (b) process innovations: "the implementation of a new or significantly improved production or delivery method" (OECD, 2005, p. 151). On the whole, innovation is "the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment" (Trott, 2008, p. 15).

Research on innovation has manifested some agreement that innovation is a multistage process with varied activities and behaviors (Kanter, 2000; Wheelwright, 1994). As reported by Majaro (1992), innovation occurs through four stages, including idea generation, screening, feasibility, and implementation. Likewise, a model proposed by Kanter (2000) outlines four tasks involved in innovation as (a) *idea generation and activation of the drivers of the innovation*, (b) *coalition building and acquisition of the power necessary to move the idea into reality*, (c) *idea realization and innovation production, turning the idea into a model—a product or plan or prototype that can be used*, and (d) *transfer or diffusion, the spreading of the model—the commercialization of the product, the adoption of the idea* (Myers, 2009, p. 96). Seeing that innovation is characterized by discontinuous activities rather than sequential stages, individuals can be involved in any combination of these stages at the same time (Robben, 1999). Altogether, innovation is a process of putting new ideas into action by sifting, refining, and implementing (Gurteen, 1998).

The Construct of Spontaneity

The essence of spontaneity and its influence on the human condition have been discussed in the domain of psychotherapy. During the 20th century, the most prominent person who introduced the concept of spontaneity to the field of psychotherapy was Jacob Levy Moreno, the founder of psychodrama (Davelaar, Araujo, & Kipper, 2008). Psychodrama is an action method of psychotherapy which helps clients be more constructively spontaneous (Wilkins, 1999). Most commonly, psychodrama is used in a group setting with people experiencing behavioral problems and emotional or mental health difficulties (Wilkins, 1999). It includes elements of theater and is often conducted on a platform or even a space (Wilson, 1994). Participants then are invited to take on a role and act out events from their past so that they can evaluate their behavior and gain insight into their lives (Kellermann, 1992). By seeing themselves and their situations from an outside perspective, clients are able to explore new solutions and solve personal problems. For this reason, psychodrama is recognized as a powerful and effective form of psychotherapy which helps people develop spontaneous action (Chung, 2013).

Moreno (1934) emphasized that spontaneity is the core curative factor of psychodrama. According to Sternberg and Garcia (2000), novelty and adequacy are the two key components of Moreno's definition of spontaneity. In fact, the word "spontaneity" derives from the Latin *sponte*, which means "of free will" (Moreno, 1987). To act with free will is thus to act voluntarily (Beck & Cicovacki, 2001). In Moreno's early writings, he believed "spontaneity operates in the present, now and here; it propels an individual towards an adequate response to a new situation or a new response to an old situation" (Moreno, 1953, p. 42). Carter (1994) also considered spontaneity to be a "readiness for a free and vital response to the emerging moment" (p. 41). More specifically, it is "an emergent, psychological state of heightened attention to the environment combined with increased self-awareness of thought and feelings, during which people are ready to immediately decide to act (or not to act) responsibly" (Roos & Roos, 2006, p. 2). Based on this definition, spontaneity can be thought of as a psychological energy, which assists participants in psychodrama to behave adequately without a second thought, inhibition, or self-doubt (Collins, Kumar, Treadwell, & Leach, 1997; Fox, 1987; Wyatt, 1988).

Moreno (1971) also asserted that spontaneity was a highly organized form of action rather than an automatic activity, disorderly conduct, or emotional impulsivity. In brief, spontaneity differs from impulsivity (Roos & Roos, 2006). The definition of impulsivity has been refined by Moreno (1947) as reacting immediately to various stimuli. In other words, impulsivity is a behavior without careful and adequate consideration. This explains what Jennings et al. (2005) stated: "The idea of spontaneous action does not refer to being out of control or lacking appropriate boundaries. It is more a question of being sufficiently free of past and future to act freely in the present moment" (p. 117). Therefore, spontaneity is not an uncontrolled, disorderly or impulsive action (Roos & Roos, 2006). Instead, it is an inner state of readiness that enables the individual to respond as needed (Moreno, 1987).

As aforementioned, "spontaneity propels a variable degree of satisfactory response which an individual manifests in a situation of variable degree of novelty" (Moreno, 1934, p. 42). To determine whether one is acting spontaneously, the action must be (a)

within the parameters of the situation, (b) *adequate to the demands of the situation*, (c) *novel, in order to generate energy to have an impact*, and (d) *creative, modifying the established pattern from which the action arises in order to increase future adaptability* (Miller, Baim, Burmeister, & Maciel, 2007, p. 104). In short, spontaneity is the ability to react with adequacy, flexibility, vitality, originality, and creativity in the face of the unexpected (McVea, 2009; Moreno, 1953).

## Theory of Spontaneity and Creativity

Spontaneity and creativity are the keystones of Moreno's theories and his work. In Moreno's theory of spontaneity-creativity, he saw spontaneity and creativity as a twin concept, with creativity as the "arch substance" and spontaneity as the "arch catalyzer" (Moreno, 1955a, p. 105). Creativity is the germ of the idea, and spontaneity is the impetus to realize the creative idea and bring it to fruition (Sternberg & Garcia, 2000). That is, when individuals have creative thoughts, but lack spontaneity, they still cannot put their ideas into practice. As Moreno (1993) postulated, "There were many more Beethovens born than the one who created the sonatas. However, although they may have had the ideas for a symphony, they did not have the spontaneity to actualize the idea" (p. 39). Thereupon, spontaneity and creativity are partners in moving human beings through life. If only one of them is operating, people become stuck.

To describe how spontaneity and creativity work, Moreno developed the Canon of Creativity. The Canon of Creativity (see Figure 1) demonstrates the interaction and correlation of spontaneity, creativity, and cultural conserve (Moreno, 1953). In the figure, S refers to spontaneity, C to creativity, CC to the cultural conserve, and W to the warming-up process. The canon, originally conceived as a four-step process and later expanded to five steps (Kipper, 2006), proposes that the creative process begins with (a) warming up that gives rise to (b) spontaneity or a "spontaneous state" (Kipper, 2006). Then, the spontaneous state prompts (c) a creative state, followed by (d) a creative act, which ends with (e) a concrete product or a "cultural conserve" (Moreno, 1955b). In other words, the warming up is a prelude to the emergence of spontaneity. Through a warm-up process, individuals are allowed to create a new response to an old dilemma or

an adequate response to a current situation (Moreno, 1953). After warming up to the spontaneous state, the creative state will be triggered. Particularly, a creative state is an internal state of the creator's mind where fragmented and temporary ideas disorderly run (Kipper & Buras, 2009). To implement these creative ideas, individuals need to take action and carry them out. In the end, the completion of the creative act is manifested in a cultural conserve which can be used repeatedly such as a book, a picture, an electronic device, a mathematical formula, a technology (Kipper & Buras, 2009; Moreno, 1955c). Clearly, the Canon of Creativity has shown how spontaneity leads to creativity. It is an ideal template for the psychodrama therapy, which aims at guiding clients to foster spontaneity and creativity (Kipper, Green, & Prorak, 2010).

Lai (2017) developed a 21-item Chinese version of Spontaneity Scale that supported the five factor structure named "freedom", "pleasure", "confidence", "felt love", and "vigor". The result revealed good reliability and test-retest reliability.

Based on the literature above, the researchers formulate the research question, will spontaneity significantly predict innovative behavior.
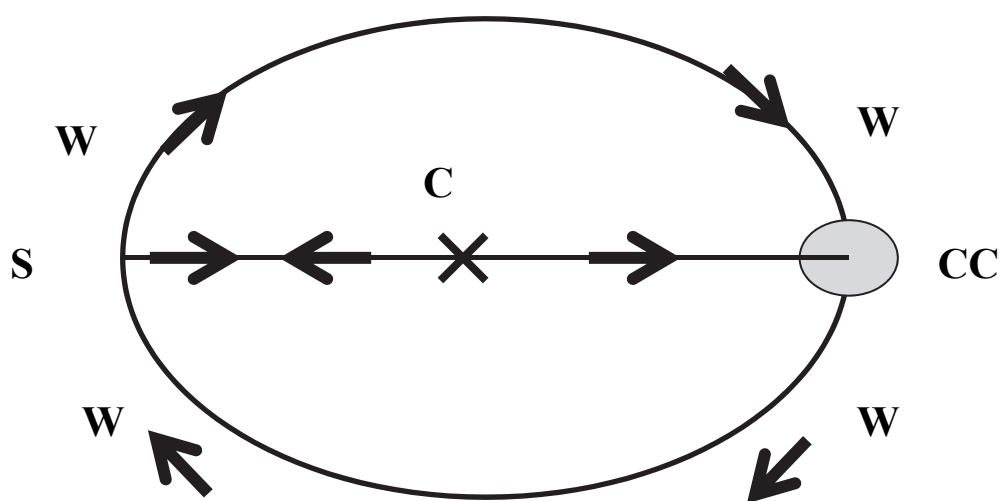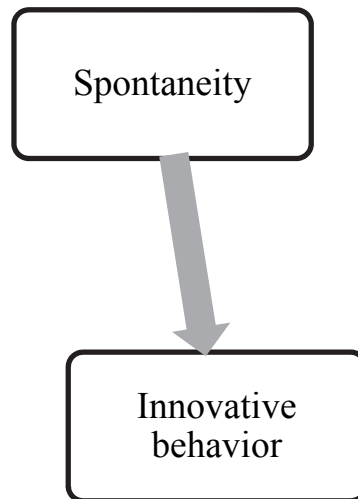

Figure 1   Canon of creativity

Based on the literature above, the following hypothesis is forwarded.

Hypothesis 1: spontaneity will significantly predict innovative behavior.

Figure 2 shows the conceptual model of this research.

Figure 2　A conceptual model

METHODS

Participants

Participants were 491 undergraduate and graduate students from different departments at two universities in central Taiwan: 241 (49.3%) males and 248 (50.7%) females. Their ages ranged from 18 to 47 years ($M = 21.43$; $SD = 3.28$).

Table 1 shows the demographic information of the participants. Four demographic variables were investigated, including (a) gender, (b) age, (c) institution, and (d) level of education. The data indicated that female respondents ($N = 248$, 50.5%) marginally outnumbered the males ($N = 241$, 49.1%). Regarding age, most of the participants were under 21 years old with 54.6% ($N = 268$), followed by respondents between 21 to 30 years old ($N = 211$, 43%). In addition, 51.1% ($N = 251$) of the participants were from TransWorld University while the others ($N = 240$, 48.9%) were from National Yunlin University of Science and Technology. Finally, the majority of respondents of this research were freshmen ($N = 191$, 38.9%).

Procedure

The participants were administered the questionnaires in small groups in between classes. Their participation was voluntary and anonymous to encourage honesty and openness. The only personal information asked was their gender, age, and level of education. They were assured that they could terminate their participation any time without penalty. They did not receive any reward for their participation in the study.

Data was collected from May to June, 2016. A total of 600 questionnaires were distributed, ending up with 503 in return. After removing 12 invalid copies, 491 were counted as valid. The overall response rate is 82%.

Table 1 Demographic Information for the Sample

Item	Number	Percentage
Gender		
Male	241	49.1%
Female	248	50.5%
Total	489	99.6%
Age		
Under 21 years	268	54.6%
21~30 years	211	43.0%
31~40 years	8	1.6%
41~50 years	1	0.2%
Total	488	99.4%
Institution		
National Yunlin University of Science and Technology (YunTech)	240	48.9%
TransWorld University (TWU)	251	51.1%
Total	491	100%
Level of Education		
Freshman	191	38.9%
Sophomore	87	17.7%
Junior	17	3.5%
Senior	14	2.9%
Master or above	180	36.7%
Total	489	99.6%

Instruments

Three self-report and paper-and-pencil inventories were administered to the participants (a) the Spontaneity Scale (Lai, 2017) and (b) the Kirton Adaption-Innovation Inventory (KAI; Kirton, 1976). These measures are described in the following subsections.

The Spontaneity Scale (SS).

The Spontaneity Scale (Lai, 2017) is a self-report inventory designed to measure the intensity of the presence of spontaneity. The tool consists of 21 items divided into five subscales with each addressing a different aspect of spontaneity. These five domains include "freedom," "pleasure," "confidence," "felt love," and "vigor." It poses the question: "How strongly do you have these feelings and thoughts during a typical day?" The question is followed by a list of 21 adjectives describing various feelings and thoughts such as "courageous," "joyful," "powerful," "energized," "uninhibited," or "fulfilled." The participants are asked to respond by rating each item on a 6-point Likert type scale ranging from 1 = almost never to 6 = almost always. The Spontaneity Scale and its five subscales, with good reliabilities, were significantly related to creativity tendency and innovative behavior (Lai, 2017). The Cronbach's alpha for the Spontaneity Scale in the present study was .96.

The Kirton Adaption-Innovation Inventory (KAI)

The Kirton Adaption-Innovation Inventory (KAI) was developed by Kirton (1976) to gauge a basic personality dimension: a continuum which ranges from *adaption*, an ability to "do things better," to *innovation*, an ability to "do things differently." It is a 32-item instrument with a 5-point scale ranging from 1 = very hard to 5 = very easy. Each question asks respondents how difficult it would be for he or she to behave in the way described—that is, to present a certain image of him- or herself for an extended period of time (Carnabuci & Diószegi, 2015). Example items include "Likes to vary set routines at a moment's notice," "Often risks doing things differently," and "Prefers changes to occur gradually." Typically, a person's overall KAI score will fall between 32 and 160. Someone with an adaptive cognitive style will score in the 60-90 range. An individual with an innovative style will score between 110 and 140.

Specifically, this inventory is categorized into three subscale factors: originality (O), efficiency (E), and rule/group conformity (R/C). Each factor stands for different sections of the inventory so as to produce more accurate results (Mudd, 1996). Stum (2009, p. 68) described these three subscales as: (a) O–*refers to the preference for production of original ideas*, (b) E– *categorizes an individual's preference for efficiency, precision, and reliability*, and (c) R/C– *operates according to rules and regulations*.

As alluded to earlier, innovators tend to proliferate opinions and compulsively toy with ideas (Kirton, 1976; Rogers & Anderson, 1959). Adaptors, on the other hand, prefer the generation of fewer original ideas that are useful and relevant to the problem as they see it (Kirton, 1976). Moreover, innovators are undisciplined, thinking tangentially, and often challenging rules. Conversely, adaptors have proper respect for authority and rules. They are characterized by discipline, efficiency, and conformity.

For the application of the KAI, Kirton (1976) has asserted (a) that all individuals can be located on this continuum and (b) that adaption-innovation is an important personality dimension relevant to situations which involve organizational change. It is also logical to expect the adaption-innovation continuum to be useful in the study of creativity in organizational setting (Keller & Holland, 1978). Finally, the reliability and validity of the KAI has been established in many studies conducted with different populations and in different countries (e.g., Bagozzi & Foxall, 1995; Shiomi & Loo, 1999). The Cronbach's alpha for the KAI was .91.

Table 2 shows descriptive statistics and the correlations of each scale.

Data analysis

Data analyses use the method of t-test to examined mean differences of gender and of the adaptors and innovators, and use the method of structural equation modeling to investigate the research question.

Table 2　Descriptive Statistics and the Correlations of Each Scale

	1	2	3	4	5	6	8	9	10
1. SPONTANEITY									
2. FREEDOM	.831**								
3. PLEASURE	.866**	.763**							
4. CONFIDENCE	.895**	.634**	.662**						
5. LOVE	.768**	.596**	.655**	.670**					
6. VIGOR	.901**	.591**	.656**	.818**	.739**				
7. ORIGINALITY	.612**	.423**	.451**	.597**	.464**	.645**			
8. EFFICIENCY	.340**	.226**	.201**	.345**	.259**	.406**	.525**		
10. CONFORMITY	.282**	.258**	.202**	.239**	.306**	.306**	.334**	.398**	
Mean	68.76	15.67	15.36	3.78	12.35	23.08	43.50	23.99	43.77
SD	14.72	3.77	3.78	3.78	2.88	5.55	7.69	4.63	6.64

Note. N = 491; * *p* < .05, ** *p* < .01

RESULTS

Gender Differences

As shown in Table 3, there was a statistically significant gender difference in "confidence," which is an aspect of spontaneity. Males scored significantly higher (*M* = 15.15, *SD* = 4.20) than females (*M* = 14.23, *SD* = 3.29), *t*(485) = 2.68, *p* = .008.

With regard to the subscales of KAI, there was a significant gender difference in "originality." Male respondents scored significantly higher (*M* = 44.59, *SD* = 8.21) than female respondents (*M* = 42.49, *SD* = 7.01), *t*(483) = 3.04, *p* = .002.

Table 3　Summary of Gender Differences Analysis in Measurement Variables

Variables	Males			Females			*t*	*df*	*p*
	N	*M*	*SD*	*N*	*M*	*SD*			
Spontaneity	239	70.04	16.63	245	67.58	12.50	1.85	482	.066
Spontaneity: Freedom	240	15.94	4.21	245	15.42	3.26	1.54	483	.126
Spontaneity: Pleasure	239	15.63	4.09	247	15.11	3.45	1.52	484	.129
Spontaneity: Confidence	240	15.15	4.20	247	14.23	3.29	2.68	485	.008**
Spontaneity: Love	240	12.17	3.14	246	12.53	2.59	-1.40	484	.162
Spontaneity: Vigor	240	23.45	6.01	248	22.75	5.05	1.39	486	.168
KAI: Originality	237	44.59	8.21	248	42.49	7.01	3.04	483	.002**
KAI: Efficiency	237	24.21	4.91	248	23.77	4.35	1.05	483	.293
KAI: Conformity	237	43.87	6.87	247	43.70	6.42	.27	482	.788

* *p* < .05, ** *p* < .01

Adaptors and Innovators Differences

According to the KAI, there are two major styles of creativity: adaption and innovation. Adaptors tend to do things in a disciplined way, while innovators prefer to thinking "out of the box." A 32-item KAI used to measure an individual's problem-solving style on a scale from 32 to 160. A person with an adaptive style will score in the 60–90 range, whereas a person with an innovative style will score between 110 and 140. The participants were categorized into the group of adaptors and innovators according to their KAI scores.

Table 4 illustrates several significant effects in terms of adaptors' and innovators' differences. As predicted, results from an independent samples t-test demonstrated that innovators scored significantly higher ($M = 72.40$, $SD = 13.46$) than adaptors ($M = 56.73$, $SD = 9.16$) in "spontaneity", $t(31) = -7.26$, $p < .001$.

At the subscale level of spontaneity, there were significant differences between the adaptors and the innovators in "freedom," "pleasure," "confidence," "love," and "vigor." First, innovators ($M = 16.41$, $SD = 3.54$) reported significantly higher levels of "freedom" than adaptors ($M = 13.45$, $SD = 3.86$), $t(234) = -3.70$, $p < .001$. Second, innovators scored significantly higher ($M = 15.98$, $SD = 3.65$) in "pleasure" than adaptors ($M = 13.87$, $SD = 3.45$), $t(235) = -2.65$, $p = .009$. Third, innovators also scored significantly higher in "confidence" compared to adaptors (for innovative group, $M = 15.51$, $SD = 3.49$; for adaptive group, $M = 11.57$, $SD = 3.44$), $t(235) = -5.15$, $p < .001$. Fourth, innovators ($M = 12.86$, $SD = 2.67$) reported significantly higher levels of "love" than adaptors ($M = 10.37$, $SD = 2.93$), $t(235) = -4.22$, $p < .001$. Finally, innovators scored significantly higher in "vigor" compared to adaptors (for innovative group, $M = 24.50$, $SD = 5.06$; for adaptive group, $M = 17.48$, $SD = 4.25$), $t(29) = -7.38$, $p < .001$.

Table 4　Summary of Adaptors and Innovators Differences Analysis in Measurement Variables

Variables	Adaptors			Innovators					
	N	M	SD	N	M	SD	t	df	p
Spontaneity	22	56.73	9.16	214	72.40	13.46	-7.26	31	.000***
Spontaneity: Freedom	22	13.45	3.86	214	16.41	3.54	-3.70	234	.000***
Spontaneity: Pleasure	23	13.87	3.45	214	15.98	3.65	-2.65	235	.009**
Spontaneity: Confidence	23	11.57	3.44	214	15.51	3.49	-5.15	235	.000***
Spontaneity: Love	23	10.37	2.93	214	12.86	2.67	-4.22	235	.000***
Spontaneity: Vigor	23	17.48	4.25	214	24.50	5.06	-7.38	29	.000***

* $p < .05$, ** $p < .01$, *** $p < .001$

Structural Equation Modeling

The structural equation model analysis followed a two-step approach as recommended by Anderson and Gerbing (1988) with Amos 18 statistical software. The first step in this approach is to develop an acceptable measurement model and to ascertain whether each of the latent variables was represented by its indicators. If the measurement model was accepted, then the structural model using the maximum likelihood estimation was tested to predict hypothesized relationships among the study variables.

Six latent variables, including spontaneity and the KAI with the three subscale factors of the KAI were examined in the present study. Soliz and Harwood (2006) created three parcels per factor by aggregating randomly grouped items within each scale. Note that, in the subset-item-parcel approach, there are various ways to form parcels. For example, using an 9-item scale, researchers can create three parcels with an equal number of items per parcel. In order to control for inflated measurement errors due to multiple items, following Soliz and Harwood's (2006) method, item parceling was used on originality (13 items), efficiency (7 items), and rule/group conformity (12 items) as three indicators. Thus, 17 indicators were tested in this section.

The structural model was evaluated against five criteria: The chi-square (x^2) likelihood ratio statistic, the comparative fit index (CFI), the normed fit index (NFI), and the root mean square error of estimation (RMSEA). The analysis of the measurement model resulted in a good fit: x^2 (76, $N = 491$) = 264.331, $p < .001$. Moreover, the other fit

indexes also attained the recommended target values, which showed that the model yielded acceptable fit measures for all indexes. The value of the CFI was .95, which was greater than .90. The NFI was .93, which was above .90. The IFI was .95, the TLI was .93, and the RMSEA was .052. Overall, the fit indexes indicate an acceptable model fit with the data. The fit indexes of the observed model are shown in Table 5.

**Table 5** Fit Indexes of the Observed Model (N = 491)

Fit Index	Recommended Level	Observed Model	Appraisal
x^2	Non-significant	$264.331/p < .001$	
x^2/df	< 5.0	3.671	Good
RMSEA	$\leq .05$	.052	Good
CFI	$> .90$	.949	Good
NFI	$> .90$	.931	Good
RFI	$> .90$	.900	Good
IFI	$> .90$	.949	Good
TLI	$> .90$	.925	Good

According to the results presented in Figure 3, the research model explained 57% of the variance in the KAI, 90% of the variance in originality, 64% of the variance in efficiency, and 45% of the variance in conformity. Table 6 and Figure 3 also revealed that spontaneity significantly predicted the KAI ($\beta = .754$, $p < .001$). Additionally, the KAI significantly had a positive relation with originality ($\beta = .946$, $p < .001$), efficiency ($\beta = .642$, $p < .001$), and conformity ($\beta = .454$, $p < .001$).

Table 6 Results of the Structural Model

Relationships	β	p
Spontaneity → KAI	.754	$< .001$
KAI → Originality	.946	$< .001$
KAI → Efficiency	.642	$< .001$
KAI → Conformity	.454	$< .001$

Note. β: Standardized regression weights
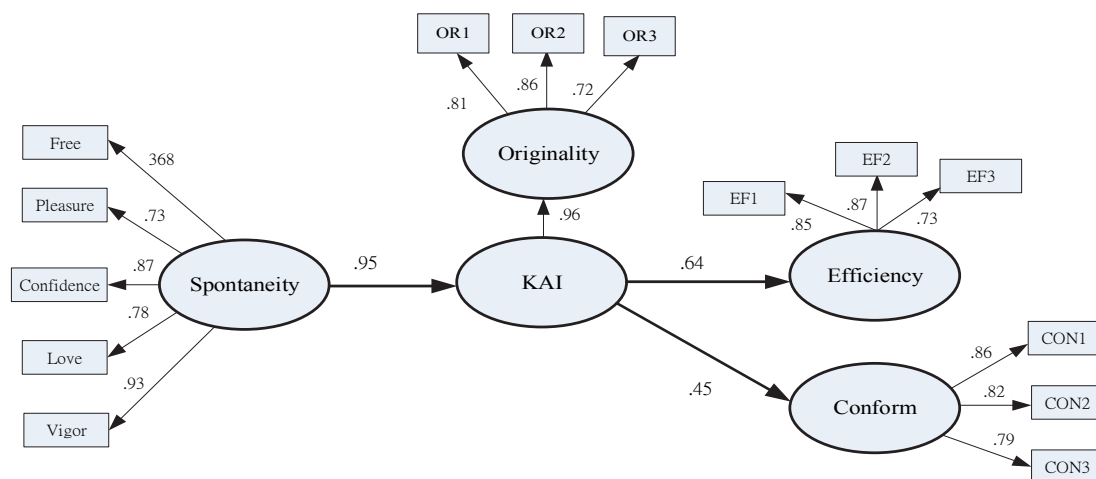
Figure 3　Structural Model

Note. OR1-OR3 are three originality parceling indices; EF1-EF3 are three efficiency parceling indices; CON1-CON3 are three Conform indices.

DISCUSSION

The purpose of this research is to examine the relationship between spontaneity and innovative behavior.

First of all, male students scored significantly higher on "confidence." This indicated that males appeared to be more confident than females. Thirdly, female participants scored significantly lower on "originality." This implied that males have higher levels of innovation than females.

As predicted, results from an independent samples *t*-test demonstrated that innovators scored significantly higher than adaptors in "spontaneity." As such, the researcher could assert that adaptors had lower levels of spontaneity than innovators. The hypothesis that spontaneity is highly related to innovative behavior was supported. In addition, "originality" is the quality of innovators. The present findings provided a few clues that pointed to the fact that spontaneity is positively related to innovative behavior: the higher the spontaneity, the greater the innovative performance.

As aforementioned, the researchers develop the hypothesis that spontaneity will significantly predicted innovative behavior. Results from the SEM in the present study demonstrated that spontaneity significantly predicted creative/innovative behavior. This finding was consistent with research by Moreno (1953) who developed the Canon of

Creativity showing that spontaneity leads to creativity. As such, spontaneity significantly had a positive relationship with the development of innovative behavior—the higher the spontaneity, the better the innovative performance.

One implication of this research is that psychodrama group training can enhance spontaneity leading to innovative performance.

Several contributions of the present study are given as follows. First of all, this study psychometrically validated the Spontaneity Scale by examining its reliability and validity features. The results may help improve its use in related spontaneity studies of psychotherapy as well as in clinical practice. Second, this study can provide theoretical and practical implications for the development of innovative behavior for employees at workplaces and clients in psychotherapy. Organizations nowadays seek to develop innovation by hiring individuals perceived as particularly talented or by implementing policies and procedures that increase employees' motivation to think "out of the box." In the future, spontaneity training may represent a new route to innovation. In other words, spontaneity may provide a distinctive intrapsychic path to enhanced workplace innovation. Third, this research suggested that educational institutions should set up pre- and in-service courses or workshops to provide students with opportunities to boost their spontaneity. If possible, schools could also establish programs in promoting innovation. Furthermore, counselors in schools could encourage their students to develop spontaneity to access their creativity in their guidance classes. Finally, the current study had demonstrated the differences between the terms innovation and creativity in the process of literature analysis, benefiting future researchers in exploring the issue of innovation. It is hoped that this paper can serve as a basis for a fruitful program of research and practice that explore spontaneity and innovation.

Limitations and Future Directions

There were several limitations that the current study confronted with. First, the respondents were college and graduate students from two universities in Yunlin County. As a result, the sample might not represent the whole students in Taiwan. Likewise, it is not appropriate to generalize the current results to other samples such as employees in

non-academic workplaces or clients receiving mental health services. Future research could recruit a national sample with different age groups and levels of social economic status (SES) or from different universities and/or organizations to further explore their levels of spontaneity. Additionally, it should be noticed that innovative performance of college or graduate students is crucial because they live in a highly competitive environment. Individuals need to be innovative so that they can stand out in the job market.

REFERNCES

Addis, S. (2009). Creativity and innovation. *Rough Notes, 152*(4), 78-80.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin, 103*(3), 411.

Ardts, J. C., van der Velde, M. E., & Maurer, T. J. (2010). The influence of perceived characteristics of management development programs on employee outcomes. *Human Resource Development Quarterly, 21*(4), 411-434.

Bagozzi, R. P., & Foxall, G. R. (1995). Construct validity and generalizability of the Kirton Adaption–Innovation Inventory. *European journal of personality, 9*(3), 185-206.

Beck, L. W., & Cicovacki, P. (2001). *Kant's Legacy: Essays in Honor of Lewis White Beck* (Vol. 2): University Rochester Press.

Carnabuci, G., & Diószegi, B. (2015). Social networks, cognitive style, and innovative performance: A contingency perspective. *Academy of Management Journal, 58*(3), 881-905.

Carter, P. (1994). Towards a Definition for Spontaneity. *Australian and Aotearoa New Zealand Psychodrama Association Journal*(3), 39.

Chung, S. F. (2013). A Review of Psychodrama and Group Process. *International Journal of Social Work and Human Services Practice, 1*(2), 105-114.

Collins, L., Kumar, V., Treadwell, T., & Leach, E. (1997). The Personal Attitude Scale: A scale to measure spontaneity. *Journal of Group Psychotherapy, Psychodrama*

and Sociometry, 49(4), 147-156.

Cooper, J. R. (1998). A multidimensional approach to the adoption of innovation. *Management decision, 36*(8), 493-502.

Davelaar, P. M., Araujo, F. S., & Kipper, D. A. (2008). The Revised Spontaneity Assessment Inventory (SAI-R): Relationship to goal orientation, motivation, perceived self-efficacy, and self-esteem. *The Arts in Psychotherapy, 35*(2), 117-128.

Ee, J., Seng, T. O., & Kwang, N. A. (2007). Styles of creativity: Adaptors and innovators in a Singapore context. *Asia Pacific Education Review, 8*(3), 364-373.

Fox, J. (1987). The Essential Moreno. *New York (deutsch: Moreno, Psychodrama und Soziometrie, 1989)*.

Goldsmith, R. E. (1986). Convergent validity of four innovativeness scales. *Educational and psychological measurement, 46*(1), 81-87.

Gopalakrishnan, S., & Damanpour, F. (1997). A review of innovation research in economics, sociology and technology management. *Omega, 25*(1), 15-28.

Gurteen, D. (1998). Knowledge, creativity and innovation. *Journal of knowledge Management, 2*(1), 5-13.

Hurt, H. T., Joseph, K., & Cook, C. D. (1977). Scales for the measurement of innovativeness. *Human Communication Research, 4*(1), 58-65.

Jackson, D. N. (1976). *Jackson personality inventory JPI: manual*: Research Psychologists Press.

Janssen, O. (2005). The joint impact of perceived influence and supervisor supportiveness on employee innovative behaviour. *Journal of occupational and organizational psychology, 78*(4), 573-579.

Jennings, S., Cattanach, A., Mitchell, S., Chesner, A., Meldrum, B., & Nfa, S. M. (2005). *The handbook of dramatherapy*: Routledge.

Kanter, R. M. (2000). When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organization.

Keller, R. T., & Holland, W. E. (1978). A cross-validation study of the Kirton Adaption-Innovation Inventory in three research and development organizations.

Applied Psychological Measurement, 2(4), 563-570.

Kellermann, P. F. (1992). *Focus on psychodrama: The therapeutic aspects of psychodrama*: Jessica Kingsley Publishers.

Kipper, D. A. (2006). The canon of spontaneity-creativity revisited: The effect of empirical findings. *Journal of Group Psychotherapy & Sociometry, 59*, 117-125.

Kipper, D. A., & Buras, E. (2009). Measurement of spontaneity: The relationship between Intensity and frequency of the spontaneous experience. *Perceptual and motor skills, 108*(2), 362-366.

Kipper, D. A., Green, D. J., & Prorak, A. (2010). The relationship among spontaneity, impulsivity, and creativity. *Journal of Creativity in Mental Health, 5*(1), 39-53.

Kirton, M. (1976). Adaptors and innovators: A description and measure. *Journal of applied psychology, 61*(5), 622.

Kleysen, R. F., & Street, C. T. (2001). Toward a multi-dimensional measure of individual innovative behavior. *Journal of intellectual Capital, 2*(3), 284-296.

Kotsemir, M. N., Abroskin, A., & Meissner, D. (2013). Innovation concepts and typology–an evolutionary discussion.

Kwang, N. A., & Rodrigues, D. (2002). A Big-Five Personality profile of the adaptor and innovator. *The Journal of Creative Behavior, 36*(4), 254-268.

Lai, C. C. (2017). The development of spontaneity scale. *Psychological Testing, 64*(1), 51-74.

Majaro, S. (1992). *Managing ideas for profit: The creative gap*: McGraw-Hill.

McVea, C. S. (2009). *Resolving painful emotional experience during psychodrama*. Queensland University of Technology.

Miller, C., Baim, C., Burmeister, J., & Maciel, M. (2007). Psychodrama: Advances in theory and practice. *Advancing theory in therapy: Psychodrama, spirituality, and Souldrama*, 189-200.

Moreno, J. (1934). Who shall survive?: A new approach to the problem of human interrelations.

Moreno, J. (1953). Who shall survive?

Moreno, J. (1955a). Theory of spontaneity-creativity. *Sociometry, 18*(4), 105-118.

Moreno, J. (1955b). Canon of creativity. *Sociometry, 18*(4), 103-104.

Moreno, J. (1955c). System of Spontaneity-Creativity-Conserve, a Reply to P. Sorokin. *Sociometry, 18*(4), 126-136.

Moreno, J. (1971). *The words of the Father*. Beacon, NY: Beacon House.

Moreno, J. (1987). *The essential Moreno: Writings on psychodrama, group method, and spontaneity*: Springer Publishing Company.

Moreno, J. (1993). Who Shall Survive?, Student edition of Moreno 1934, 1953 and 1978, Roanoke, VA: American Society of Group Psychotherapy and Psychodrama: Royal Publishing Co.

Mudd, S. (1996). Kirton's A–I theory: Evidence bearing on the style/level and factor composition issues. *British Journal of Psychology, 87*(2), 241-254.

Mumford, M. D., & Gustafson, S. B. (1988). Creativity syndrome: Integration, application, and innovation. *Psychological bulletin, 103*(1), 27.

Myers, P. S. (2009). *Knowledge management and organisational design*: Routledge.

OECD. (2005). Oslo Manuals. Guidelines for Collecting and Interpreting Innovation Data, 3rd edition.

Robben, M. A. (1999). *A Study of Innovative Behavior in High Technology Product Development Organizations*: Taylor & Francis.

Robertson, T. S. (1967). The process of innovation and the diffusion of innovation. *The Journal of Marketing*, 14-19.

Rogers, C., & Anderson, H. (1959). Creativity and its Cultivation. *Creativity and its cultivation*.

Roos, J., & Roos, M. (2006). On Spontaneity. *A: STARBUCK, W*.

Shiomi, K., & Loo, R. (1999). Cross-cultural response styles on the Kirton Adaption-Innovation Inventory. *Social Behavior and Personality: an international journal, 27*(4), 413-419.

Soliz, J., & Harwood, J. (2006). Shared family identity, age salience, and intergroup contact: Investigation of the grandparent-grandchild relationship. *Communication Monographs, 73*, 87–107.

Stashevsky, S., Burke, R., Carmeli, A., Meitar, R., & Weisberg, J. (2006). Self-leadership

skills and innovative behavior at work. *International Journal of Manpower, 27*(1), 75-90.

Sternberg, P., & Garcia, A. (2000). *Sociodrama: who's in your shoes?* : Greenwood Publishing Group.

Stum, J. (2009). Kirton's adaption-innovation theory: Managing cognitive styles in times of diversity and change. *Emerging Leadership Journeys, 2*(1), 66-78.

Trott, P. (2008). *Innovation management and new product development*: Pearson education.

Van de Ven, A. H. (1986). Central problems in the management of innovation. *Management science, 32*(5), 590-607.

West, M. A., & Altink, W. M. (1996). Innovation at work: Individual, group, organizational, and socio-historical perspectives. *European Journal of Work and Organizational Psychology, 5*(1), 3-11.

West, M. A., and Farr, J.L. (1990). Innovation at work. In M.A. West and J.L. Farr (Eds), Innovation and creativity at work: Psychological and organizational strategies (pp. 3-13). Chichester, England: Wiley.

Wheelwright, S. C. (1994). *Leading Product Development: The Senior Manager's Guide to Creating and Shaping*: Simon and Schuster.

Wilkins, P. (1999). *Psychodrama*: Sage.

Wilson, E. (1994). *The theater experience*: ERIC.

Wyatt, T. A. (1988). Spontaneity and naturalness. *Journal of Humanistic Psychology, 28*(1), 97-107.

Xerri, M., Brunetto, Y., & Shacklock, K. (2009). *The innovative behaviour of employees within a small to medium sized enterprise: a social capital perspective.*

Zhuang, L., Williamson, D., & Carter, M. (1999). Innovate or liquidate-are all organisations convinced? A two-phased study into the innovation process. *Management Decision, 37*(1), 57-71.

The Exploration of Spontaneity and Innovative Behavior

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ABSTRACT

This research aims to investigate the relationship between spontaneity innovative behavior. Participants were undergraduate and graduate students at two universities in central Taiwan ($N = 491$) who were administered two inventories measuring spontaneity and innovative behavior. The study examined the proposed research model through using structural equation modeling (SEM). Results showed that spontaneity (five constructs were included: freedom, pleasure, confidence, love, and vigor) significantly predicted innovative behavior: the higher the spontaneity, the better the innovative performance. There was a statistically significant gender difference in "confidence," which is an aspect of spontaneity. Males scored significantly higher than females in "confidence". Male respondents scored significantly higher than female respondents in KAI. The innovators reported significantly higher levels of "freedom", "pleasure", "confidence", "love" and "vigor" than adaptors. The results of structural equation model revealed that spontaneity significantly influenced the KAI. Additionally, the KAI significantly had a positive relation with originality, efficiency, and conformity ($\beta = .454$, $p < .001$). The research model explained 57% of the variance in the KAI, 90% of the variance in originality, 64% of the variance in efficiency, and 45% of the variance in conformity. The results have shed a light on spontaneity and innovation. Limitations of the present study and suggestions for further researchers were discussed.