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Personality traits, social capital, and entrepreneurial creativity: comparing green socioentrepreneurial intentions across Taiwan and Hong Kong

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ABSTRACT

Promoting green socioentrepreneurship is crucial for sustainable economic development in the Asia-Pacific region, particularly in highly urbanised areas such as Taiwan and Hong Kong. However, little research has focused on this topic. Therefore, we conducted two studies to analyse how personality traits, entrepreneurial creativity, and social capital affect green socioentrepreneurial intentions among university students in Taiwan and Hong Kong. The results of Study 1 confirmed the factor structures of the four scales used in this study. The results of Study 2 revealed that though the effects of predictor variables on the outcome variable were varied, the mediation models of entrepreneurial creativity across contexts were partially supported. The major differences between Taiwan and Hong Kong lay in the effects resulting from usefulness, openness, agreeableness, conscientiousness, and bonding social capital.

KEYWORDS

Entrepreneurial creativity; personality traits; social capital; social entrepreneurial intentions; social enterprises

Introduction

Climate change is altering the physical and biological systems of human society. Since the 1970s, numerous scientists have advocated that human society must consider the ecological, ethical, and social dimensions of future environmental practices (Basiago 1998). The disruption of global ecological systems and great biogeochemical cycles indicates that disorder is inherent in the cognition, intellectual priorities, and loyalties of the industrial mindset. Over the past three decades, green socioentrepreneurship (GSE) has become a crucial topic of discussion that has increasingly attracted dedicated younger generations (Liang et al. 2017).

GSE has grown out of anticipating the upcoming clash between economic and ecological systems at a global scale, and the resulting grave ecological catastrophes. GSE practitioners are passionate about creating and developing sustainable solutions to address the aforementioned pressing global challenges. Promoting GSE is crucial for sustainable economic development in the Asia-Pacific region, particularly the highly urbanised areas such as Taiwan and Hong Kong. However, few research studies have focused on this topic and many open questions require clarification (Wang et al. 2016). An in-depth understanding regarding the effects of critical factors on the

green socioentrepreneurial intentions (GSEIs) of young generations would benefit Asia-Pacific green economics, societal sustainability, and agrirural development.

Prior research has focused on how personality traits influence entrepreneurial intentions and behaviour (e.g. Brandstätter 2011; Zhao, Seibert, and Lumpkin 2010), but few studies have analysed the effects on socioentrepreneurial intentions (İrengün and Arıkboğa 2015). Previous studies have indicated that creativity is a critical motivator of entrepreneurial intention (Carayannis et al. 2006), and that creative people exhibit high levels of entrepreneurial intentions (Zampetakis 2008). Although creativity is an essential characteristic of an entrepreneur, research on entrepreneurial creativity is limited. In addition, social capital has been proven to affect entrepreneurial intentions (Liñán and Santos 2007), especially for the career choices of young people (Sharma 2014). However, studies on this topic are still insufficient (Tran and Von Korflesch 2016), let alone integrated studies examining the influence of personality traits, entrepreneurial creativity, and social capital on GSEIs.

The demand for entrepreneurship education has increased noticeably over the past two decades (Law and Breznik 2016; Pittaway and Cope 2007); thus, increasing numbers of governments and universities have launched entrepreneurship programmes worldwide (Brooks et al. 2007). The environment of a university campus provides tremendous opportunity and support to potential business start-ups, particularly through the enrichment of their entrepreneurial intentions (Saeed et al. 2015). Successfully generating these intentions depends on carefully designing coursework, planning placement experiences, and developing long-term environmental practice strategies.

Building a theoretical foundation to address the aforementioned issues motivated the two subsequent studies. The main purpose of this integrative research was to analyse how personality traits, entrepreneurial creativity, and social capital affect GSEIs among university students across contexts. The first study was conducted to confirm the factor structures of the scales, namely the five-factor model (FFM) of personality traits (Thompson 2008), entrepreneurial creativity (Chia and Liang 2016), social capital (Williams 2006), and GSEI (Wang et al. 2016). The second study built predictive models to compare university students in Taiwan and Hong Kong.

Research context

Taiwan, officially the Republic of China (ROC), was under Japanese rule between 1895 and 1945. After that, although the People's Republic of China (PRC) continues to claim that Taiwan is under its governance, the ROC is the legitimate government of Taiwan. Because of rapid industrialisation and economic growth in previous decades, the gross domestic product of Taiwan has grown significantly. Taiwan is also heralded as an example of a country that has enjoyed a smooth transition to democratisation. However, industrialisation and democratisation have created several obstacles for sustainable development. For example, Taiwan is facing an imminent food crisis because the food self-sufficiency ratio is only 32% (Chen and Chang 2013), and the implementation of environmental practices is hindered by numerous agents and stakeholders with greatly divergent interests. Because of this, attention towards GSE is increasing (Liang et al. 2017). The first university in Taiwan was established in 1928, and currently, a total of 163 higher education institutions are in Taiwan. The Taiwanese government invests approximately 2% of its GDP in higher education. Similar to many other countries, undergraduate programmes require 4 years of study, whereas graduate programmes leading to a master's degree require 1–4 years of study, and doctorate programmes require 2–7 years of study. Moreover, greater demand in the marketplace has led to a substantial increase in the number of graduate students, particularly in the technology sector (FICHET 2017).

Hong Kong became a British colony between 1842 and 1997, and it is now a special administrative region of the PRC. Hong Kong is one of the most vital financial centres and consistently ranks as the most competitive economic entity in the world. While Hong Kong has one of the highest per capita incomes in the world, it suffers from severe income inequality. Moreover, seasonal air pollution originating from neighbouring industrial areas of the PRC has resulted in a high level of atmospheric particulates (Wang and Lu 2006). Social awareness among the youth in Hong Kong has increased,

particularly in the issues such as high property prices, the widening gap between the rich and the poor, diminishing career prospects, and fighting for democracy, highlighting the growth of social enterprises in Hong Kong (Yip 2014). Traditionally, higher education in Hong Kong followed the British education system, but some fundamental changes have been introduced since the 2000s. These new policies and practices are related to quality assurance, university governance, funding mechanisms, private and community colleges, and internationalisation (the Education and Manpower Bureau 2005). Educators considered that these different approaches institutionalised have resulted in the higher education system being more entrepreneurial or business-like (Lee 2014), whereas universities are concerned with their financial performance.

Taiwan and Hong Kong share several common attributes. Chinese culture has a profound influence on the inhabitants of both regions, where people believe in self-reliance, family, and responsibilities over rights (Wong, Wang, and Kaun 2009). They had once been colonies and have now become highly industrialised and urbanised, though the political system of Taiwan is much more democratic and flexible than that of Hong Kong. The socioeconomic context and governmental policies have had a considerable influence on the development of social enterprises in both regions (Chan, Kuan, and Wang 2011), rendering variances regarding respective importance, institutional context, marketing strategies, and government policies (Chan, Kuan, and Wang 2011) worthy of thorough investigation.

Theoretical background

Social enterprises and socioentrepreneurial intention

A social enterprise is a venture intended primarily for social benefit, the surpluses of which are principally reinvested for social purposes rather than maximising profit for shareholders and owners (DTI Social Enterprise Unit 2003, 6). Therefore, social entrepreneurs are those who recognise opportunities to satisfy unmet societal needs, gather the necessary resources, and use these to make a difference (Thompson, Alvy, and Lees 2000). Social enterprises are increasingly compelled to engage in the market economy, and they share characteristics with earned income ventures initiated by conventional nonprofits because both are driven by the dual goals of social benefit and trade revenues (Katre and Salipante 2012). In addition, social enterprises have used their community-spirited motives to attract human and social capital and engendered survival strategies premised on grant dependency; in other words, social enterprises should be self-sustaining in the long term (Chell 2007).

Entrepreneurial intention is defined as an individual's self-acknowledged conviction to set up a new business venture and consciously prepare to do so at some point in the future (Thompson 2009). Previous studies regarding entrepreneurial intention have focused on for-profit organisations (Krueger, Reilly, and Carsrud 2000); however, Pittaway and Cope (2007) emphasised that more studies on entrepreneurial intention should be linked to employability in small and medium enterprises or nonprofit organisations, to provide justifications that are broader than economic purposes alone. In addition, entrepreneurs who establish firms differ considerably from firm-owners who were promoted or hired into the position. Moreover, those who inherit or purchase a firm fall between these two extremes, and they represent a diverse mix of people regarding their underlying motivations and attitudes (Cooper and Dunkelberg 1986). Specifically, different types of organisations and background characteristics of entrepreneurs reflect distinct entrepreneurial intentions (Lans, Gulikers, and Batterink 2010; Liñán and Chen 2009).

Personality traits and social capital related to socioentrepreneurial intention

The emergence of the FFM of personality enables researchers to organise a variety of personality variables into a small but meaningful set of trait constructs. Based on Goldberg's (1992) 100-item FFM, Thompson (2008) developed the International English Big Five Mini-Markers and demonstrated

the invariance of this instrument across several cultures. The FFM structure consists of five dimensions: extraversion, openness, neuroticism, conscientiousness, and agreeableness. According to early studies (Costa and McCrae 1992; Goldberg 1992), people who score high on extraversion tend to be cheerful, enjoy people and large groups, and seek excitement and stimulation. People with high openness tend to seek new experiences, explore novel ideas, and have a preference for variety, intellectual curiosity, depth of feeling, and behavioural flexibility. People with high neuroticism tend to experience numerous negative emotions including anxiety, hostility, depression, fear, sadness, anger, impulsiveness, and vulnerability. People scoring high on conscientiousness have a tendency towards self-control, organisation, hard work, persistence, and active planning. Finally, people with high agreeableness are altruistic, trusting, compliant, warm, sympathetic to others, and have cooperative values.

Recent meta-analytic studies have reported strong associations between personality traits and entrepreneurship (Brandstätter 2011; Zhao, Seibert, and Lumpkin 2010), indicating that people with entrepreneurial intentions typically score higher on extraversion, openness, and conscientiousness, and comparatively lower on neuroticism and agreeableness. Regarding personality traits of social entrepreneurs, Nga and Shamuganathan (2010) indicated that agreeableness positively influences all four dimensions of socioentrepreneurship, whereas openness exerts a positive influence on only three dimensions, namely social vision, innovation, and financial returns. İrengün and Arikboğa (2015) supported the optimal effect of agreeableness on socioentrepreneurship, and they suggested additional influences such as neuroticism on resource use, openness on social vision, and extraversion on resource use and financial returns. Tran and Von Korflesch (2016) proposed that people with socioentrepreneurial intentions would score high on extraversion, openness, conscientiousness, and agreeableness, but low on neuroticism. However, İrengün and Arikboğa (2015) argued that people with high openness are unlikely to participate in long-term socioentrepreneurship activities that require effort and, as a result, would likely take more time. This argument is further seconded by the findings of Liang et al. (2015) in which openness exerted a negative effect on socioentrepreneurial services.

Based on these studies, the current study proposed the first set of hypotheses:

H1a. Extraversion, conscientiousness, and agreeableness positively affect GSEIs.

H1b. Openness and neuroticism negatively affect GSEIs.

Social capital can be defined as the scale of an available social network and the aggregate quality of resources owned by all members in the social network (Bourdieu 1986). Social capital is beneficial for entrepreneurial activities, particularly in the acquisition of knowledge, identification of business opportunities, networking, establishment of reputation, and improvement in performance (Shaw, Lam, and Carter 2008). Social capital is not only a critical capacity for improving local communities but also an essential factor in strengthening quality of life and sustainable development; therefore, social capital is considered valuable in the establishment and success of a social enterprise (Newman and Dale 2005). In addition, social capital is particularly important for new businesses in developing or transitional economies (Manev, Gyoshev, and Manolova 2005), which are the focal economies of most social entrepreneurs and are closely associated with the contexts of this study. Moreover, social capital has a strong effect on career choices and can promote the entrepreneurial intention of younger generations (Sharma 2014), who are the research target of the present study. Putnam (2000) identified the social capital dimensions of 'bonding' and 'bridging'. Bonding social capital indicates strong ties with family and close friends who may provide emotional support or access to scarce resources. Bridging social capital refers to weak ties among individuals by connecting people from different networks and providing access to new perspectives. Correspondingly, Williams (2006) adopted this concept and developed a scale to operationalise social capital. Liñán and Santos (2007) indicated that higher social capital generates higher entrepreneurial intentions. Lorenz (2008) revealed that social entrepreneurs tend to use more bonding social capital during their initial

formation phase but must use more bridging social capital when they become established and wish to expand. For students who are deciding their future careers, prior research suggested that the bridging social capital of Taiwanese tourism students contributes to their entrepreneurial conviction rather than entrepreneurial preparation (Chia and Liang 2016). Although Yang, Gong, and Huo (2011) supported that social capital influences individual career decision, previous studies have indicated that the effects of social capital are probably more malignant in a transition economy than in a market economy (Luk et al. 2008). Therefore, a second set of hypotheses was proposed:

H2a. Bonding social capital positively affects GSEIs.

H2b. Bridging social capital positively affects GSEIs.

Entrepreneurial creativity related to socioentrepreneurial intention

Academic publications prior to 1900 have suggested that creativity requires both originality and usefulness (Runco and Jaeger 2012). Originality is often labelled as novelty, or something that is unique, unusual, new, unexpected, or surprising. Likewise, usefulness is perceived as appropriateness, effectiveness, utility, practicality, adaptation, value, or flexibility. Entrepreneurship is a form of creativity because new businesses are often both original and useful, and can affect the market process (Sternberg and Lubart 1999). The present study, taking Amabile (1997) into account, uses entrepreneurial creativity to refer to the generation and implementation of novel and appropriate ideas to start up new ventures or to revive established organisations.

Social entrepreneurs were reported to exhibit statistically significantly higher levels of creativity and risk-taking than traditional entrepreneurs (Smith, Bell, and Watts 2014). Previous studies have confirmed the positive role of universities in developing entrepreneurial intention and generating entrepreneurial behaviour in students (Law and Breznik 2016; Saeed et al. 2015), and have suggested that lifelong student characteristics such as curiosity, exploration, and creativity positively affect entrepreneurial intentions (Chia and Liang 2016) because novel and useful ideas are the lifeblood of entrepreneurship. This lifeblood not only facilitates entrepreneurial intentions but also has an impact throughout the lifetime of entrepreneurs, not just during the span of the business. The third hypothesis was thus proposed:

H3. Entrepreneurial creativity positively affects GSEIs.

Personality traits and social capital related to entrepreneurial creativity

Previous studies have revealed that creative personal identity positively associated with openness and extraversion, but negatively associated with agreeableness, whereas the effects of neuroticism and conscientiousness are unsteady (Feist 1998; King, McKee Walker, and Broyles 1996). Recent research has clarified the relationship between these five traits and the two creativity dimensions. For example, Chen and Chen (2015) indicated that the traits of openness and conscientiousness positively predict both originality and usefulness. Chang et al. (2015) suggested that openness affects both originality and usefulness, whereas conscientiousness and agreeableness only affect usefulness. They sensitively demonstrated the complicated interaction effects among conscientiousness, agreeableness, and openness. In addition, recent meta-analytic studies have reported that entrepreneurs or people with entrepreneurial intentions typically score higher on extraversion, openness, and conscientiousness, and lower on neuroticism and agreeableness (Brandstätter 2011; Zhao, Seibert, and Lumpkin 2010).

On the basis of this prior research, this study proposed the fourth set of hypotheses:

H4a. Extraversion, openness, and neuroticism positively affect entrepreneurial creativity.

H4b. Conscientiousness and agreeableness negatively affect entrepreneurial creativity.

Early studies have suggested that social networks enable members to acquire diverse knowledge and experience, and they thus result in inspiring the members to generate creative ideas (Dyer and Singh 1998; Sivadas and Dwyer 2000). Recent research has supported that great ideational productivity occurs when trusted partners exchange and refine ideas through a form of shared cognition; that is, resource-related variables and access to and possession of social capital can benefit entrepreneurial creativity (Gemmell, Boland, and Kolb 2012). To set up social enterprises, people must use social capital creatively (European Commission 2003). Praszkie, Nowak, and Zabłocka-Bursa (2009) indicated that behind successful social innovation is usually a creative and committed social entrepreneur. On this basis, the fifth and sixth hypotheses were proposed:

- H5a. Bonding social capital positively affects entrepreneurial creativity.
- H5b. Bridging social capital positively affects entrepreneurial creativity.
- H6. Personality traits and social capital affect GSEIs through the mediation of entrepreneurial creativity.

Study 1: confirmatory factor analysis

Method

The first study recruited 141 students from two universities in Taiwan and 139 students from two universities in Hong Kong. The participants were recruited as a validation sample to confirm the factor structures of the four scales by performing a confirmatory factor analysis (CFA). Participation was voluntary and confidential. The surveys were administered by graduate assistants who were accompanied by their class instructor. After the exclusion of 42 questionnaires (which had a high proportion of contradictory views or were incomplete), the total number of valid questionnaires was 238, with 119 for each region (Table 1).

This study adopted Thompson’s International English Big Five Mini-Markers (2008). Of the 40 adjectives in the original personality trait model, 20 with the highest factor loadings were selected as survey items. A total of 12 items assessing entrepreneurial creativity from the Chia and Liang (2016) study were revised and included in the survey. In addition, Wang and Lu (2006) social capital scale was used, and the 10 items with the highest factor loadings were chosen to measure offline and online social capital. Finally, eight items of entrepreneurial intention from the study of Wang et al. (2016) and Ip et al. (2017) were revised for the GSE research context. The scales were measured using a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Results

In this study, the factorial validity of the factor structures was tested using LISREL (Version 8.80) by performing CFA with maximum likelihood estimation. The five-factor solution of personality traits, two-factor solution of entrepreneurial creativity, two-factor solution of social capital, and two-factor solution of GSEIs yielded a good fit ($\chi^2 = 2120.45$, $df = 1120$, $p < .005$, RMSEA = .061, SRMR = .077, CFI = .95, NFI = .90, NNFI = .95).

In this study, construct validity was determined based on convergent and discriminant validity. The convergent validity of each factor was assessed by standardised factor loading, composite

Table 1. Descriptive analysis of Study 1 (n = 238).

	Taiwan (n = 119)				Hong Kong (n = 119)			
Gender	49 men		70 women		47 men		72 women	
Academic standings	80 undergraduates		39 postgraduates		98 undergraduates		21 postgraduates	
Age	20 or younger	21–25	26–30	31 or older	20 or younger	21–25	26–30	31 or older
	19	61	31	8	23	75	16	5

Table 2. The CFA of personality traits ($n = 238$).

Factor/item	Factor loadings (FLs)	Measurement errors (MEs)	Composite reliability (CR)	Average variance extracted (AVE)
Extraversion			.8518	.5949
Talkative	.80	.35		
Outgoing	.88	.23		
Reserved	.70	.52		
Shy	.66	.56		
Openness to experience			.6420	.3157
Creative	.67	.55		
Philosophical	.65	.57		
Unimaginative	.50	.80		
Unintellectual	.50	.80		
Neuroticism			.7618	.4470
Anxious	.55	.70		
Jealous	.62	.61		
Unworried	.77	.41		
Unenvious	.74	.46		
Conscientiousness			.8038	.5166
Systematic	.90	.20		
Careful	.79	.37		
Disorganised	.61	.63		
Inefficient	.52	.73		
Agreeableness			.6402	.3086
Sympathetic	.66	.57		
Not harsh	.60	.64		
Unkind	.55	.70		
Rude	.50	.80		

reliability, and average variance extracted. Discriminant validity was tested by calculating the confidence intervals of the interfactor correlation estimates, denoted as φ . The results indicated that convergent validity was achieved (factor loading $>.5$), and the φ values among five factors ranged from -0.4372 to 0.6068 ($1 > \varphi > -1$). Therefore, each personality trait factor achieved convergent validity and discriminant validity (Table 2).

Accordingly, each factor of entrepreneurial creativity achieved convergent validity (factor loading $>.5$). The discriminant validity results showed that the φ values between Factors 1 and 2 ranged from .7712 to .8888, thereby also confirming the discriminant validity (Table 3).

Based on the analysis, each factor of social capital achieved convergent validity. The discriminant validity results showed that the φ values between Factors 1 and 2 ranged from .4428 to .7172, thereby confirming the discriminant validity (Table 4).

Table 3. The CFA of entrepreneurial creativity ($n = 238$).

Factor/item	FLs	MEs	CR	AVE
Originality			.9103	.6345
I can develop an unconventional business plan	.82	.33		
I can develop a unique business plan	.85	.28		
I am not good at identifying new market needs	.50	.76		
I am good at proposing innovative ideas based on market needs	.81	.34		
I can develop a business plan that can draw the market spotlight	.91	.18		
I can develop a business plan that can lead the market	.86	.26		
Usefulness			.8553	.5355
I understand the diverse needs of various customers	.73	.47		
I am unable to adapt flexibly to market changes	.50	.99		
I consider the preference of target consumers	.67	.56		
I can develop a business plan that meets the target market's demand	.87	.24		
I can develop a business plan that attracts investors' attention	.91	.18		
My business plan can adapt to different markets after adjustments	.77	.41		

Table 4. The CFA of social capital ($n = 238$).

Factor/item	FLs	MEs	CR	AVE
Bonding			.8011	.4636
There are several people I trust to help solve my problems	.88	.22		
There is someone I can turn to for advice about making crucial decisions	.89	.21		
If I need an emergency loan of NT\$ 15,000 (HK\$ 4000), I have no one I can ask	.50	.86		
The people I interact with would put their reputation on the line for me	.52	.75		
The people I interact with would help me fight an injustice	.72	.48		
Bridging			.7867	.4415
Interacting with people makes me interested in things that happen outside of my town	.93	.14		
Interacting with people online/offline makes me want to try new things	.90	.18		
Talking with people does not make me curious about other places in the world	.51	.81		
Interacting with people makes me feel part of a larger community	.50	.78		
Interacting with people makes me feel connected to the bigger picture	.58	.67		

Accordingly, each factor of social capital achieved convergent validity. The discriminant validity results showed that the φ values between Factors 1 and 2 ranged from .4428 to .7172, thereby confirming the discriminant validity (Table 5).

Study 2: testing the mediation model

Method

The second study recruited 320 students from 3 universities in Taiwan and 320 students from 3 universities in Hong Kong as the sample to construct the hypothesised mediation model. Participation was again voluntary and confidential. The measurement tools and survey procedure were identical to those of the first study. After the exclusion of 81 invalid questionnaires, the total number of valid questionnaires was 559 (276 from Taiwan and 283 in Hong Kong; Table 6).

Results

The six sets of proposed hypotheses were tested using LISREL (Version 8.80) by performing structural equation modelling with maximum likelihood estimation. First, we tested the effects of personality

Table 5. The CFA of GSEIs ($n = 238$).

Factor/item	FLs	MEs	CR	AVE
Conviction			.8741	.6404
I wish to start a social enterprise that assists in alleviating environmental issues	.59	.66		
I have a preliminary idea for a social enterprise to implement in the future	.79	.38		
My professional goal is to become a social entrepreneur	.87	.24		
I am willing to do anything to become a social entrepreneur	.91	.17		
Preparation			.8738	.6380
I expect that at some point in the future, I will be involved in launching an organisation that aims to promote environmental sustainability	.93	.13		
I expect that at some point in the future, I will be involved in launching an organisation that aims to help disadvantaged groups	.83	.31		
I will act as a professional manager and get involved in the management of a social enterprise through promotion	.80	.36		
If I inherit my family's business, I plan on transforming it into a social enterprise	.62	.62		

Table 6. Descriptive analysis of Study 2 ($n = 559$).

	Taiwan ($n = 276$)				Hong Kong ($n = 283$)			
Gender	133 men		143 women		129 men		154 women	
Academic standings	198 undergraduates		78 postgraduates		217 undergraduates		66 postgraduates	
Age	20 or younger	21–25	26–30	31 or older	20 or younger	21–25	26–30	31 or older
	41	176	38	21	65	189	19	10

traits and social capital (predictor variables) on GSEIs (outcome variable). Second, we examined the effects of personality traits and social capital on the mediator (entrepreneurial creativity). The final step was to show that the strength of the relationship between the predictors and the outcome is significantly reduced when the mediator is added to the model. According to our data, the relationship between the two variables and the outcome variable was significantly reduced when the mediator was included in the model. Thus the mediation model was supported.

Although the initially hypothesised model showed a good fit to the present data, not all factors were significantly associated with GSEIs. Therefore, we removed the nonsignificant paths and then revised the structural model. The final model of the Taiwan sample showed a model fit comparable to that of the initial model ($\chi^2 = 1095.58$, $df = 480$, $p < .005$, $RMSEA = .076$, $SRMR = .077$, $CFI = .95$, $NFI = .91$, $NNLI = .94$). The results explained a substantial level of variance for the dimensions of conviction ($R^2 = .39$) and preparation ($R^2 = .27$). Overall, the structural model in Figure 1 shows that entrepreneurial creativity partially mediates the effects of personality traits and social capital on GSEIs; thus, Hypothesis 6 was partially supported. Table 7 shows the correlation coefficients and the effects of the latent independent variables.

In particular, agreeableness directly and indirectly affected entrepreneurial preparation, whereas openness only indirectly affected entrepreneurial conviction. Because the effects of the other three traits were nonsignificant, both Hypotheses 1a and 1b were partially supported. In addition, bonding social capital directly affected entrepreneurial conviction, whereas the effect of bridging social capital was nonsignificant; hence, Hypothesis 2a was partially supported and Hypothesis 2b was rejected. Moreover, originality affected entrepreneurial conviction and preparation, but the effect of usefulness was nonsignificant; thus, Hypothesis 3 was partially supported. Furthermore, both openness and agreeableness affected the two dimensions of entrepreneurial creativity; therefore, Hypothesis 4a was partially supported and Hypothesis 4b was rejected. Finally, bonding social capital affected usefulness; hence, Hypothesis 5a was partially supported and Hypothesis 5b was rejected.

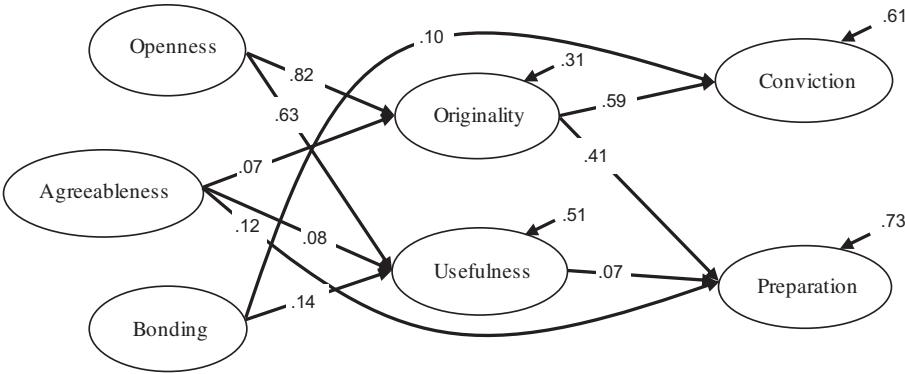


Figure 1. Mediation model of entrepreneurial creativity in the relationship between personality traits and social capital on GSEIs for the Taiwan sample ($n = 276$).

Table 7. Correlation coefficients and the effects of latent independent variables for the Taiwan sample ($n = 276$).

Independent variables	1	2	3	Direct effect		Indirect effect		Total	
				CON	PRE	CON	PRE	CON	PRE
1. Openness	1					.48	.38	.48	.38
2. Agreeableness	.21	1			.12	.04	.03	.04	.15
3. Bonding	.24	.45	1	.10			.01	.10	.01

Note: CON = Conviction, PRE = Preparation.

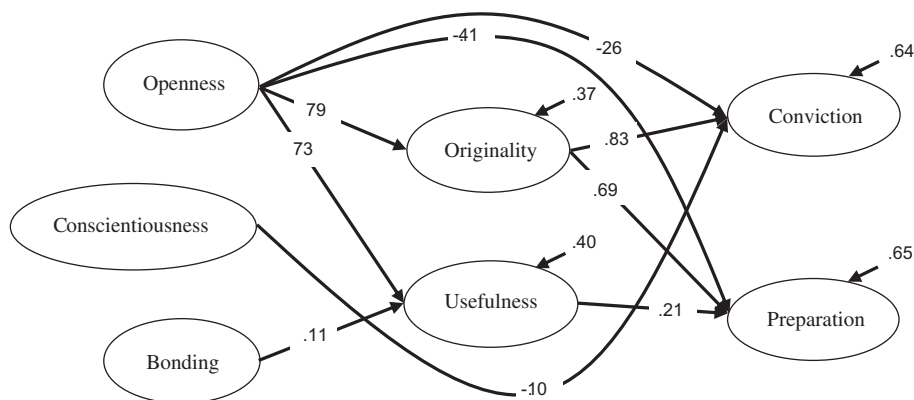


Figure 2. Mediation model of entrepreneurial creativity in the relationship between personality traits and social capital on GSEIs for the Hong Kong sample ($n = 283$).

Table 8. Correlation coefficients and the effects of latent independent variables for the Hong Kong sample ($n = 283$).

Independent variables	1	2	3	Direct effect		Indirect effect		Total	
				CON	PRE	CON	PRE	CON	PRE
1. Openness	1			-.26	-.41	.66	.70	.40	.29
2. Conscientiousness	.46	1		-.10				-.10	
3. Bonding	.39	.23	1				.02		.02

Note: CON = Conviction, PRE = Preparation.

With regard to the Hong Kong sample, we also removed the nonsignificant paths and then revised the initial model. The final model showed a good fit to the present data and is comparable to that of the initial model ($\chi^2 = 1366.55$, $df = 480$, $p < .005$, $RMSEA = .072$, $SRMR = .075$, $CFI = .95$, $NFI = .92$, $NNLI = .94$). The results explained a substantial level of variance for the dimensions of conviction ($R^2 = .36$) and preparation ($R^2 = .35$). Overall, the structural model in Figure 2 shows that entrepreneurial creativity also partially mediates the effects of personality traits and social capital on GSEIs; hence, Hypothesis 6 was partially supported for the Hong Kong sample. Table 8 shows the correlation coefficients and the effects of the latent independent variables.

In particular, conscientiousness directly and negatively affected entrepreneurial conviction, whereas openness directly and negatively affected entrepreneurial conviction and preparation. The effects of the other three traits were nonsignificant; accordingly, both Hypotheses 1a and 1b were partially supported. Additionally, bonding social capital indirectly affected entrepreneurial

Table 9. Differences between Taiwan and Hong Kong ($n = 559$).

	χ^2	df	$\Delta\chi^2$	Δdf	p
Free estimation of two sample models	2978.6686	1223			
Constrained the value of Path 1 to be zero	2983.6028	1224	4.9342	1	.026330
Constrained the value of Path 2 to be zero	2984.9267	1224	6.2581	1	.012363
Constrained the value of Path 3 to be zero	2988.1582	1224	9.4896	1	.002066
Constrained the value of Path 4 to be zero	2981.9570	1224	3.2884	1	.069771
Constrained the value of Path 5 to be zero	2982.4307	1224	3.7621	1	.052427
Constrained the values of Paths 6 & 7 to be equal	2983.4966	1224	4.8280	1	.028001
Constrained the values of Paths 8 & 9 to be equal	2983.2495	1224	4.5809	1	.032330
Constrained the values of Paths 10 & 11 to be equal	2979.3796	1224	0.7110	1	.099112

Note: Path 1: openness on conviction in Hong Kong sample (HKS); Path 2: conscientiousness on conviction in HKS; Path 3: openness on preparation in HKS; Path 4: bonding social capital on conviction in Taiwan sample (TS); Path 5: agreeableness on preparation in TS; Path 6: openness on usefulness in TS; Path 7: openness on usefulness in HKS; Path 8: originality on conviction in TS; Path 9: originality on conviction in HKS; Path 10: usefulness on preparation in TS; Path 11: usefulness on preparation in HKS.

preparation, and the effect of bridging social capital was nonsignificant; thus Hypothesis 2a was partially supported and Hypothesis 2b was rejected. Moreover, originality affected entrepreneurial conviction and preparation, whereas usefulness only affected entrepreneurial preparation; hence, Hypothesis 3 was partially supported. Furthermore, only openness affected the two dimensions of entrepreneurial creativity; therefore, Hypothesis 4a was partially supported and Hypothesis 4b was rejected. Finally, bonding social capital affected usefulness; consequently, Hypothesis 5a was partially supported and Hypothesis 5b was rejected.

The differences between two samples were tested by multiple group structural modelling, and Table 9 reports the results.

Discussion

The results of Study 1 confirmed the factor structures of the scales used in the subsequent studies; specifically, it is valid to divide personality traits into extraversion, openness to experience, neuroticism, conscientiousness, and agreeableness; entrepreneurial creativity into originality and usefulness; social capital into bridging and bonding; and GSEIs into conviction and preparation. According to the results, extraversion, neuroticism, and bridging capital had no effect on GSEIs. Previous studies have reported that extraversion and neuroticism had inconsistent effects on SEIs (Ip et al. 2017; İrengün and Arikboğa 2015; Nga and Shamuganathan 2010; Tran and Von Korflesch 2016; Wood 2012). These contradictory research outcomes may have resulted from differences in the studied sociocultural characteristics, including political and economic situations, ethnic and cultural backgrounds, the nature of social problems, and participant age. In addition, Lorenz (2008) indicated that social entrepreneurs use less bridging social capital during their initial formative phase, and this may explain our results.

Direct effects

Regarding the Taiwan sample, the conviction of GSEIs is affected by originality and bonding social capital. This result concurs with the findings of previous studies (Lorenz 2008; Smith, Bell, and Watts 2014), implying that people possessing higher levels of originality are more confident about confronting threatening difficulties. Bonding social capital—which is characterised by strong ties between individuals within the same group in which individuals share similar experiences and lifestyles as well as similar interests and expectations—has been proven to be an appropriate antecedent of GSEIs, particularly for building belief. In addition, the preparation of GSEIs is affected by originality, usefulness, and agreeableness. This result echoes the findings of prior research (Chia and Liang 2016; Wang et al. 2016), meaning that novel ideas and practical approaches benefit from breaking through ever-changing environmental challenges and concurrently gain reasonable profits. Agreeableness, signifying altruistic and sympathetic behaviour to others, is a strong predictor of social entrepreneurship, particularly of taking action. Taken together, to facilitate Taiwanese students' GSEIs, entrepreneurial educators should focus on enhancing entrepreneurial creativity and creating diverse opportunities for GSE teamwork so that students can become acquainted with each other's values and characteristics. In particular, they should foster strong ties by providing emotional support and shared values during the initial phase, and then emphasise humane and public welfare to trigger entrepreneurial actions.

Regarding the Hong Kong sample, the conviction of GSEIs is positively affected by originality, but negatively affected by openness and conscientiousness. The effects of originality and openness met our expectation and agree with prior research (İrengün and Arikboğa 2015; Smith, Bell, and Watts 2014). Traditionally in Eastern cultures, maintenance of the status quo, rather than openness to novel approaches, is rewarded (Tyler and Newcombe 2006), which explains the negative effect of openness. The influence of conscientiousness is unexpected, but partially supported by the finding of Tyler and Newcombe (2006). Conscientious people might focus rigidly and excessively

on task accomplishment and neglect idea cross-fertilisation in teams (Baer et al. 2008), but the optimal operation of GSE requires novel ideas and approaches. In addition, the preparation of GSEIs is positively affected by originality and usefulness, but negatively affected by openness, which meets our expectations and is in line with early studies (İrengün and Arıkboğa 2015; Liang et al. 2015). These results suggest that entrepreneurial educators in Hong Kong should also emphasise the development of entrepreneurial creativity, as well as facilitate students' passion for creating sustainable solutions for addressing ecological damage (particularly for students scoring high in openness) and concurrently cultivate their sense of flexibility about the implementation of solutions (particularly for students scoring high in conscientiousness).

Indirect effects

Regarding the Taiwan sample, although openness was expected to influence GSEIs negatively, the result reveals that this trait positively and indirectly affected both conviction and preparation through originality. Openness is a robust predictor of creativity (Chang et al. 2015), which explains this finding. This result also suggests that entrepreneurial educators should focus on enriching their coursework to enhance students' intrinsic motivation and boost their inventive ideas in order to facilitate their GSEIs (particularly for students scoring high in openness). Openness, agreeableness, and bonding social capital directly affect usefulness, but only extend a few influences on GSEIs, because usefulness has weak direct effects on either dimension of GSEIs. Usefulness refers to the capability to generate thoughts, perform behaviours, or create works that are considered appropriate or valuable within a specific sociocultural context (Chang et al. 2015). The concept of socioentrepreneurship is new to Taiwan. Most Taiwanese people perceive social contributions to be traditional public services such as fundraising for philanthropic organisations, assisting with natural disaster relief, or teaching children in remote areas (Liang et al. 2015). The dual purposes of socioentrepreneurship, namely public service execution and profit acquisition, might not be easily accepted in this sociocultural context at this time. However, this weak relationship may change as the practices and performance of socioentrepreneurship gain visibility in the future.

Regarding the Hong Kong sample, openness affected both conviction and preparation through originality and usefulness. This result implies that future interventions must be strategically planned by considering the increasing concerns of ecological crisis and the useful practices of environmental sustainability. These interventions must also be carefully designed by enriching coursework and placement experiences through the embedding of uncommon ideas and the encouragement of novel approaches. Furthermore, the result reveals that bonding social capital affected the preparation of GSEIs through usefulness. People from Hong Kong believe that creativity depends on effort and logical thinking (Seng, Keung, and Cheng 2008), which may be reflective of the political history of Hong Kong; therefore, people from Hong Kong are more inclined to adapt Western European traditions. Furthermore, the development of socioentrepreneurship is more mature in Hong Kong than in Taiwan. Most Hong Kong people have recognised the values of socioentrepreneurship and supported its practices, which explains this finding. Educational interventions for socioentrepreneurship must consider the following two aspects. First, Hong Kong is a highly urbanised region and sharp competition is common. Second, bonding social capital is characterised by shared norms and dense networks. This result suggests that, to facilitate Hong Kong students' preparation in GSE, entrepreneurial educators should also focus on collective benefits and practical actions when designing coursework and planning placement experiences, as well as on the creation of phased check-ins and celebrations.

Group contrasts

The major differences between Taiwan and Hong Kong were the effects that resulted from usefulness, openness, agreeableness, conscientiousness, and bonding social capital. First, the effect of

usefulness on socioentrepreneurial preparation was significant in the Hong Kong sample but non-significant in the Taiwan sample. As indicated earlier, this might reflect the differing maturation levels of socioentrepreneurship in each region. As time goes by, the influence of usefulness on preparation can be assured. This significant effect may also reflect Hong Kong people's view regarding creativity (as inborn ability, and also associated with effort and logical thinking) (Seng, Keung, and Cheng 2008) and the collective tendency towards pragmatism (Lee 2010).

Second, the trait openness positively and indirectly affected GSEIs through originality in the Taiwan sample, whereas it had a direct negative effect and, at the same time, an indirect positive effect (through entrepreneurial creativity) on GSEIs. Observed from the total effects of both regions (Tables 7 and 8), the positive impact resulting from this particular trait in Taiwan was larger than that in Hong Kong. The goals and mission of socioentrepreneurs are usually 'exclusive' and 'central' (Zeyen et al. 2013); hence, they may primarily focus on devotion to society in their own way, particularly to certain issues, and ignore other alternatives and opinions, which may generate a better outcome. Additionally, people scoring high on openness are unlikely to devote themselves to long-term socioentrepreneurship activities (İrengün and Arıkoğlu 2015; Liang et al. 2015). In particular, people have multiple alternatives in a highly urbanised region such as Hong Kong and can engage in careers other than being social entrepreneurs. However, our results indicate that high levels of entrepreneurial creativity can dramatically transform the negative effects of openness into optimistic forces to greatly enhance students' GSEIs in both Taiwan and Hong Kong.

Third, the trait agreeableness affected entrepreneurial preparation in the Taiwan sample, but was nonsignificant for the Hong Kong sample. Agreeableness is a robust predictor of socioentrepreneurship. Taiwanese perceive this trait as a merit, which is culturally connected to a great respect for Confucianism. However, Hong Kong is a highly internationalised region, with a complicated mixture of individualism and collectivism because of the influences of both British colonisation and Chinese governance; agreeableness could thus be valued diversely (Tyler and Newcombe 2006). In addition, the perception of agreeableness and socioentrepreneurial practices may be heavily influenced by the pragmatic predisposition of Hong Kong people, and the influence may highlight a tendency to consider concrete interests and reality as constraints (Seng, Keung, and Cheng 2008), particularly under China's ruling power.

Fourth, the trait conscientiousness negatively and directly affected entrepreneurial conviction in the Hong Kong sample, but was nonsignificant in the Taiwan sample. Previous studies have indicated conscientiousness as a positive trait important for employment and personal functioning (Brandstätter 2011; Zhao, Seibert, and Lumpkin 2010), but high conscientiousness may pose a risk for wellbeing and productivity, as well as encouraging a rigid focus on task accomplishment and neglecting of idea cross-fertilisation in teams (Baer et al. 2008). The influence of competitive reality and pragmatic tendency depends on how Hong Kong people's concrete interests are articulated with socioentrepreneurship and how achievement constraints are defined. China (the PRC) has the ultimate and institutionalised political power to determine the pace of development in Hong Kong (Seng, Keung, and Cheng 2008). The struggle for socioentrepreneurship in Hong Kong seems to be the struggle to define the harsh reality, which can hinder the contribution of high conscientiousness.

Finally, bonding social capital directly affected socioentrepreneurial conviction in the Taiwan sample and indirectly affected socioentrepreneurial preparation through usefulness in both samples. Bonding social capital is commonly found in families and close-knit groups, which adequately explains its effect on socioentrepreneurial conviction. The direct effect of bonding social capital was not manifested in the Hong Kong sample, but its indirect effect on socioentrepreneurial preparation through usefulness was observed, implying that socioentrepreneurial practices are profoundly influenced by Hong Kong people's tendency toward pragmatism and concrete interests (Lee 2010). Additionally, bonding social capital is confirmed as a crucial factor in facilitating action-based preparation by optimising the usefulness aspect of entrepreneurial creativity in both regions. Notably, the effects of bridging social capital were nonsignificant in both samples. Two possible reasons exist. First, the focus of this study was on the intention during the initial phase rather than

on the performance during the established phase (Lorenz 2008). Second, the effects of social capital could be extensive and probably malignant in transition economies such as Taiwan and Hong Kong (Luk et al. 2008). Bonding social capital can provide the foundation for developing bridging social capital; therefore, future research can focus on how the different types of social capital benefit socio-entrepreneurial performance during distinct organisational development phases.

Research limitations

Although this study expands the findings of previous research, it is not without limitations. The study has a few limitations. First, we used self-reported scales for empirical validity and to simplify the process of administering the surveys; however, this may have caused common method bias. Based on Malhotra, Kim, and Patil (2006), we adopted simple measures without sensitive questions, carefully selected our instruments, conducted CFA to confirm factor structures, and offered necessary feedback after the survey to decrease this bias and to minimise this limitation. Second, we did not adopt the leading established intention models in entrepreneurship research, such as the models of Ajzen and Fishbein, because we wished to explore alternative approaches. Third, the Big Five model was used because of its reliability and validity in measurement and its extensive adoption by different scholars. However, evidence suggests that narrow personality traits, such as innovativeness, stress tolerance, and compassion, have higher predictive power than that of the Big Five personality traits (Miller et al. 2012), which should be explored in the future. Fourth, the social capital discussed in this study was limited to bonding and bridging capitals. However, institutional social capital suggested by Woolcock (2001) should be considered in the future. Identifying the effect of access to institutional resources (e.g. banks, development agencies) on GSEI and comparing this with the effects of bonding and bridging capitals would be appealing.

Closing remarks

Despite these limitations, we conclude that although the effects of predictor variables on the outcome variable were various, the mediation models of entrepreneurial creativity across contexts were partially supported. The major differences between Taiwan and Hong Kong were the effects resulting from usefulness, openness, agreeableness, conscientiousness, and bonding social capital. The results of this study provide several contributions to entrepreneurial education. First, we successfully simplified several scales (Tables 2–4), contributing to the wider literature by providing empirically validated evidence. Second, we present alternative approaches to studying socioentrepreneurship by providing promising antecedents of EIs and SEIs, in addition to identifying the critical roles of entrepreneurial creativity and cultural context, which have rarely been studied in the past. Third, enhancing student interest and career choice in GSE practices is among the primary goals of educators concerning global sustainability. This study elucidates alternative approaches for selecting students, promoting student interests, and enabling academic success in entrepreneurship.

Historically, Taiwan and Hong Kong are heavily influenced by both Eastern and Western cultures. Numerous entrepreneurship studies at personal and cognitive levels lack contextual hints. In the same vein, abundant research at national and economic levels lacks individual considerations. Without information on macro histories and micro perspectives along with their supplemental explanations, entrepreneurship assumptions may be unwarranted. Furthermore, with growing public concern and support for GSE following the global financial crisis, the opportunity and context for such novel developments may now exist, even though public funding is tightly constrained. A key approach is to continually evaluate the extent to which intrinsic and extrinsic interactions of personal–context relationships are influenced by the unexpected dynamics of upcoming socioenvironmental problems. Some aspects of GSE have clearly been explored, yet the demand and potential for further future inquiry exist.

Disclosure statement

No potential conflict of interest was reported by the authors.

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