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Full Length Research Paper

The differential study on the employee playfulness and employee creativity of high-tech industry in Taiwan and Mainland-China

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After Taiwan and Mainland China joined the WTO, the cross-strait economy further fused into the world economic system. The opening of the "Three Links" policy gradually deepened cross-strait economic and trade relations. The competitive advantages in Mainland China, as compared to Taiwan, and the aggressive investment opportunities around China, have attracted Taiwanese businesses. In recent years, many industries, both traditional and high-tech, have relocated to Mainland China. This study aims to probe the differences in employee playfulness and creativity in the high-tech industries in Taiwan and Mainland-China. Through the literature review, empirical research methods and assessment on a case-by-case basis, the study found significant differences in employee playfulness and creativity between cross-strait employees. The playfulness qualities and creativity averages of employees in China were higher than those of Taiwanese employees.

Keywords: employee playfulness, employee creativity, high-tech industry

INTRODUCTION

Stepping into the 21st century, organizations are facing dramatic changes and competition as industries become more complex and unpredictable. In order to adapt in such an environment, corporations require greater flexibility. Past operation methods can no longer guarantee competitive advantages, and the primary means for corporations to obtain competitive advantage is constant innovation. The management guru, Michael Porter, in *The Competitive Advantage of Nations*, investigated the competitive advantages of ten successful nations in different industries, and concluded that continuous innovation was the key factor for success. He emphasized that innovation ability allowed nations and corporations to rapidly improve production capacity. Therefore, advanced nations should not only emphasize improving cost-effectiveness, but also improving their innovative abilities.

Economics guru, Joseph Schumpeter, defined innovation as: "The development of invented objects to socially acceptable activities of business value." When facing the new era of futuristic technology and paradigm shifting in the market, innovation has replaced the availability of resources, and become the key factor for determining competitive strength. Smith (1995) suggested that the innovative ability of an organization originated with creative employees, and only a few

people are endowed with this talent. The competitive advantages of an organization can be established by discovering creative employees based on their personality traits; drawing on their talents, innovative opinions, and foresights; and promoting organizational team innovation.

3M's slogan at the centennial of its establishment is "a century of innovation," and the core competitiveness of Google is "rapid innovation" (Xue, 2006). Provost (2009) also discussed the preeminent role innovation plays in improving organizations. Past operational methods can no longer guarantee corporate competitive advantage; only by continuous innovation can corporations remain competitive.

After Taiwan and Mainland China joined the WTO, the cross-strait economy further fused into the world economic system. The opening of the "Three Links" policy gradually deepens cross-strait economic and trade relations. The Ministry of Finance Customs Administration has stated that China is Taiwan's largest export market and second largest import market. Because of the significantly increased trade between Taiwan and China, customs collaboration between the two is increasingly important. The competitive advantages in Mainland China, as compared to Taiwan, and the aggressive investment invitations around China, have attracted Taiwanese businesses. In recent years, many industries, both traditional and high-tech, have relocated to Mainland China (Tung, 2006). The existing MOU (Memorandum of Understanding) in the Three Small Links being discussed is the "memorandum" in "financial supervision and cooperation" between Taiwan and China. Taiwan and China began ECFA (Economic Cooperation Framework Agreement) negotiations in June 2009, and signed the ECFA in September 2010, which was formally implemented in January 2011, opening bilateral free trade. This allowed transactions and interaction between Taiwan and China as economic entities to tighten, setting them on the path to systematic cooperation and unified development.

Kenichi Ohmae said that ECFA is a market opportunity for Taiwan, and that if Taiwan does not utilize ECFA it can only stand aside in the future. After three waves of trade and economic integration, ASEAN hopes to create an "Asia-Pacific Economic Entity" with 3 billion people by 2020. This super economic entity, with nearly half the global population will establish tariffs against other countries, and if Taiwan, also located in the Asia-Pacific, is left out, it will become an orphan of trade. In addition, the convenience of direct transportation has brought Taiwan and China closer. In the future, more Taiwanese corporate managers need to lead and manage personnel from Taiwan and China in regional organizations. Therefore, it is certainly necessary for managers to understand how Taiwanese and Chinese employees differ.

Gradually easing cross-strait relations has facilitated the closest relationship between the countries in the past 60 years. In June 2009, the first "Delegation for the promotion of cross-strait economy and trade" of the Cross-strait Economic and Trade Exchanges Association was established. Afterwards, purchasing missions were formed by various industries to purchase merchandises in Taiwan. In 2009, the value of total procurement exceeded $ 2.2 billion USD. At present, the MOU (Memorandum of Understanding), which is continuously discussed in the policy of Mini Three Links, is the "memorandum" of "financial supervision and cooperation." In addition, in 2010, Taiwan and Mainland China will decide whether to sign the ECFA (Economic Cooperation Framework Agreement). The opening of bilateral free trade makes the increases trade and exchanges between cross-trait economic groups. The convenience of direct transportation further shortens the cross-trait distance. In the future, more and more corporate managers in Taiwan will have to lead and manage cross-strait organizational staff. Therefore, it is important to understand management differences between Taiwan and Mainland China.

Political and economic differences between Taiwan and Mainland China contribute to the differences in culture, values, and behavioral patterns (Hofstede and Bond, 1988; Huang, 1993; Huang, 1994; Cheng, 1995; Chang, 2003), as well as in working attitude. In regard to management systems, especially human resources management, differences in culture, ideology, political and economical system, social welfare, and corporation organization will lead to greater obstacles (Chuang, 2003). Significant cross-cultural differences do indeed exist in human resource management and their corresponding management methods for cross-strait high-tech industry. Since China is advancing rapidly, in addition to valuing the work values of employees in China, managers should sense the transformation of employees' work values at any time, understand the differences between Taiwan and Mainland China, adopt management methods suitable for different subjects in different periods, and improve opportunity to effectively manage employees in both Taiwan and Mainland China (Su, 2003; Wu, 2004).

Traditional Chinese are very diligent and work oriented. They believe that working can lead to material wealth and bring further happiness. They also believe that everyone should devote enough time to their jobs, if possible, to obtain economic security and pride. In the minds of traditional Chinese, the value of work is greater than that of play, which seems to bring no benefit. However, past beliefs in Taiwan, such as "Sweetness comes after bitterness"; "If one does not exert oneself in youth, one will regret it in old age"; and "Material wealth exactly is life quality" have gradually changed in Taiwan. Many people have begun to realize that there is a limit to economic development and one cannot endlessly produce. Constantly working will not necessarily accompany a relative increase in personal wealth. More and more

people put emphasis on the experience "at this very moment," and enjoying life here and now. They would rather earn less money than work more because working does not equal happiness.

At present, young people demand jobs of joy and style. Compared to the past, they have more life expectations and work expectations other than salary. The new generation believes that possessing materials and material wealth does not necessarily equal happiness. They cannot stand boring, dull, and unchallenging work. Their commitment and loyalty to organizations that cannot satisfy their needs are relatively lower. They stress post-materialist values and demand self-realization, self-expression, and meaning. If they are not satisfied with their work, they change it quickly. Compared to people in the past, their opinions on work and play have changed significantly.

In January 2013, *Science* published a research report by some Australian scientists, stating that China's one-child policy has resulted in a generation of selfish and uncompetitive little emperors. The generation born in the 80s, after the one-child policy, demonstrate "clear mistrust and unreliability, fear of risk, less competitiveness, more pessimism, and less conscience." The young people of the so-called new generation believe that having material wealth does not mean happiness. They cannot bear boring, monotonous, and unchallenging work; for organizations that cannot satisfy their needs, they have relatively lower commitment and loyalty. They emphasize post-materialist value, demand self-actualization, self-expression, and meaning. If a job does not conform to their desires, they quickly find a new job. Compared to earlier generations, they demonstrate drastically different attitudes toward work and play.

Glynn and Webster (1992) surveyed 300 adults distributed in different areas of the US, and found that playfulness is positively correlated to spontaneous cognitive ability and creativity, and it could effectively predict working attitude and performance. Csikszentmihalyi (1999) interviewed 91 outstanding professionals from different industries, and found that most of them are creative people, interested in "designing or inventing new objects" and eager for things that "interest" them. They spent a lot of time on recreation every week because it provided the fluent experiences of creativity. Possessing such a playful attitude enables them to enjoy the process of working.

Understanding the importance of employee playfulness and creativity can help managers improve performance. In order to enhance the competitiveness of Taiwanese companies and the efficiency of their operation and management, this study probes the differences in employee playfulness and creativity for high-tech industries in Taiwan and Mainland-China.

Based on the literature review, and with reference to the background of C Company, this study constructs a suitable measurement scale, and conducts a case study based on empirical research. As a whole, the purposes of this study are as follows:

1. To investigate the current status of employee playfulness and employee creativity between Taiwan and Mainland-China.
2. To investigate the differences in employee playfulness and employee creativity for high-tech industries between Taiwan and Mainland-China.
3. To investigate the relevance of employee playfulness and employee creativity for high-tech industries between Taiwan and Mainland-China.

Literature Review

Employee Creativity

The study of creativity has generated a wide range of definitions. Indeed, more than 225 ways to define and measure creativity exist (Cropley, 2000; Runco, 2007). Several concepts define creativity as a characteristic of a person and others identify it as a process (Amabile, 1988). For example, Kirton (1976) included ideas of adaptation, improvement, and application. Rogers (1983) operationally defined a creative individual as the one who initially performs creative work. In her definition of creativity, Amabile (1983) included the idea of group interaction that produces novel and useful ideas. Kanter (1988) described creativity as a multistep procedure, only one step of which involves the generation of new ideas. Woodman, Sawyer and Griffin et al. (1993) defined creativity as the generation of available and useful new products or services, the process by which ideas are developed, and the process by which individuals work together in a complex social system. Therefore, most contemporary researchers and theorists have adopted a definition that focuses on the product or the outcome of a development process (Amabile, 1983, 1988; Shalley, 1991; Woodman et al., 1993; Zaltman, Duncan, and Holbek, 1973).

However, employee creativity can also be defined as the generation of novel and useful ideas or solutions concerning products, services, processes, and procedures (Amabile, 1988, 1996; Chen and Chang, 2005; Ford, and Gioia, 1995; Oldham and Cummings, 1996; Peterson and Seligman, 2004; Shalley, 1991; Wuchty, Jones, and Uzzi, 2007; Zhou and George, 2001, 2003). This definition can include creative solutions to business problems, creative business strategies, or creative changes in job processes, instruments, and organizing structures. It accommodates variance in the degree to which a new idea reflects an incremental or a radical departure from the status quo (Mumford and Gustafson, 1988; Shalley and Gilson, 2004). Using this definition, research has examined creative solutions to business problems, creative business strategies, and creative changes in job processes (Ford and Gioia, 2000;

Taggar, 2002; West and Anderson, 1996). Creative outcomes can range from minor adaptations in workflow or products to major breakthroughs and the development of new products or processes (Mumford and Gustafson, 1988).

In short, employee creativity involves useful novelty. For both specificity and integration of previous research, this study will operationally define employee creativity as the development of ideas about products, services, practices, processes, and procedures that are judged to be original and novel, as well as appropriate and potentially useful (Amabile, 1996; Oldham and Cummings, 1996; Robinson and Stern, 1998; Shalley, 1991; Shalley and Gilson, 2004; Woodman, et al., 1993; Zhou and George, 2001; Zhou and Shalley, 2003).

Because the factors affecting employee creativity remain ambiguous in the current literature, this study will focus on both previous findings and the features of individual companies to identify factors potentially associated with this phenomenon. Topics related to previous research are summarized in the following section. Researchers have responded to the growing significance of creativity by attempting to identify factors that influence employee creativity at work in terms of social, personal, and contextual variables such as intrinsic motivation (Amabile, 1996; Eisenberger and Shanock, 2003; Prajogo and Ahmed, 2006), work-related and non-work-related sources of support (Egan, 2005; Madjar, Oldham, and Pratt, 2002), social and contextual factors (Shalley and Gilson,2004), assessing job candidates' creativity (Malakate, Andriopoulos, and Gotsi, 2007), individual characteristics (McIntyre, Hite, and Richard, 2003); supervisory style (Oldham and Cummings, 1996), stress (Byron, Khazanchi, and Nazarian, 2010), internal competition between teams (Baer, Leenders, Oldham, and Vadera, 2010; Birkinshaw, 2001; Kanter, Kao, and Wiersema, 1997; Marino and Zabojnik, 2004), psychological well-being (Wright and Walton, 2003), humor (Chen and Shu, 2006), and such environmental features as job characteristics and organizational control (Kets de Vries, 2001; Lewis and Moultrie, 2005; Shalley, Gilson, and Blum, 2000).

Employee Playfulness

Glynn and Webster (1992) defined playfulness as an imaginative, less serious or metaphorical attitude toward the definition of or participation in activities that increase internal enjoyment, engagement, and satisfaction. Using a measure focused primarily on personal attributes, they employed adjective checklists to measure adults' playfulness. Factor analyses to identify the essence of playfulness, such as that performed by Lieberman (1977) on data obtained from kindergarteners, found five primary components of playfulness: cognitions, bodily sensations, spontaneity, manifest joy, and sense of humor. Thus, playfulness includes personal attributes, capabilities, and experiences.

The contribution of play has been a common theme in studies on the behavioral, contextual, and dispositional influences on creativity in children. Substantial evidence of a relationship between play and creativity in terms of behavioral and contextual influences (Dansky, 1980; Perpler and Ross, 1981; Singer and Rummo, 1973) has been found. One dimension of play that has received less attention is the dispositional aspect. In the United States, Albert Einstein, Thomas Edison, and Henry Ford, who were known for their creative contributions to society, were highly playful individuals (John-Steiner, 1985). Indeed, adults do indulge in playful behavior, defined by Glynn and Webster (1992: 83) as "a predisposition to define and engage in activities in a non-serious or fanciful manner to increase enjoyment." The playful individual engages in work, relationships, transactions and other activities with a bias towards having fun. Indeed, the experience of fun is perhaps the most salient characteristic in definitions of play (Garvey, 1977), whereas manifestations of joy and a sense of humor as well as physical, social, and cognitive spontaneity have also been highlighted (Barnett, 1991; Lieberman, 1977). Playfulness, in turn, results in greater social interaction and expressiveness (Glynn and Webster, 1993).

On the basis of theories and observations, authors have explained that playfulness can benefit people from all walks of life. Lundin (2001) emphasized the importance of job-related playfulness, describing it as a kind of attitude. As a result, these individuals brought and achieved pleasure, productivity, and passion which created a more focused, honest, and energized atmosphere at work.

Woszczynski, Roth, and Segars' (2002) review of recent research discussed playfulness as an enduring personal characteristic and an important variable in predicting behavior. Some scholars studing playfulness in terms of both situational factors and character traits have found that playfulness was affected when the environment changed. This finding contradicted the notion that playfulness constitutes an enduring quality, regarding it instead as one state or situation in which interactions between subjects and the external environment play an important role. Playfulness has been defined as the extent of engagement in play itself and the resulting pleasurable feelings experienced by the participants. Finally, scholars have combined considerations of character and environment in their construct of playfulness as a steady and long-term personal characteristic that incorporates both elements. For example, anxiety derives from both personal characteristics and external pressures. Thus, the playfulness research can be divided into three groups: studies adopting the character view, those adopting the situation view, and those adopting the character-situation interaction view.

Rogers and Sluss (1999) analyzed Einstein's creativity and inventiveness and concluded that his childhood playfulness was related to his general character and creative ability. Lieberman (1977) reported that playfulness in childhood stimulated the playfulness of many scholars. Barnett (1990) replicated Lieberman's research and reported several new findings: Playfulness constituted an intention and a personal characteristic, an intrinsic factor that stimulated playing as well as the attitude leading to participation in such play.

Playfulness was also found to result in individual and organizational learning, adaptation, community building, increased attentiveness to quality, and better overall performance (Glynn andWebster, 1992). More playful individuals exhibited higher task-related evaluations, involvement, and performance. In a further study, adult playfulness was positively correlated with innovative attitudes and intrinsic motivation and negatively correlated with a personality valuing orderliness (Glynn and Webster, 1993).

Playfulness is a concept seldom studied in adults. Playfulness at work has been shown to alleviate boredom, release tension, prevent aggressiveness, and increase group cohesion (Bowman, 1987); to improve work quality and overall performance (Glynn and Webster, 1992, 1993); and to decrease anxiety toward new technologies (Bozionelos and Bozionelos, 1997, 1999; Glynn and Webster, 1992). Curiously, no study has linked playfulness to workplace creativity, which has been commonly recognized as the adult equivalent of children's play (Day, 1979; Primeau, 1996).

It is possible that adult playfulness in the workplace has been neglected primarily due to negative attitudes toward the phenomenon. In Taiwan, the traditional concept that "achievement is founded on diligence and wasted on recklessness" grounds a more serious atmosphere and culture (Yu, 2004). Does such an atmosphere restrain playfulness and further affect the occurrence of creativity? What are the playfulness properties and behaviors associated with playfulness among adults in the workplace? This research aims to contribute to increasing creativity and performance at work by addressing adult playfulness and understanding such playfulness as it occurs within organizations.

Glynn and Webster (1993) studied workers with high IQ scores in different areas in the United States and found a positive correlation among playfulness, creative attitudes, and intrinsic motivation. Thus, playfulness should not detract from work; playful and happy workers are interested, self-motivated, tenacious, humorous, and creative. These authors suggested studying different groups of workers to investigate the relationships between playfulness and work, but follow-up studies have yet to be conducted.

The content of work represents a variable affecting the competitiveness and effectiveness of the work itself. Hard work per se has been emphasized in the past, whereas playfulness and creativity have been emphasized more recently by learning organizations. Access to playful, creative, and interesting colleagues is now seen as an important element contributing to the quality of and satisfaction with one's work. When adults like their work, work resembles entertainment. In this sort of situation, learning proceeds from a sense of playfulness rather than from a sense of mere obligation. That is, a playful attitude can incorporate new stimuli, new concepts, and new information that will eventually manifest in behavior.

Mainemelis and Ronson (2006) argued that playfulness is a phenomenon that deserves systematic research attention because it constitutes the cradle of the organizational process of creativity. They believed that the relationship between playfulness and creativity was particularly important in both intellectual and practical terms. Freud (1926), Vygotsky (1978), Huizinga (1955), Piaget (2001), Winnicott (2001), and Turner (1982) described playfulness as a natural path toward creativity. More recently, Russ (1999) and Dansky (1999) summarized empirical psychological studies that supported the role of play in fostering the creativity of both children and adults. Csikszentmihalyi (1997) and Gardner (1993) found that a common characteristic of their subjects was that they maintained a playful attitude toward their work throughout their careers. Thus, research on playfulness in other social sciences has led to a set of theoretical principles that appear generalizable to samples ranging from preschool children to Nobel laureates. These principles provided one useful starting point for thinking about the relationship between playfulness and creativity in the world of work.

RESEARCH METHOD

Research Hypotheses

This study assumes major research support form the literature in working out the following research hypothesis:
H1: There are significant differences in employee creativity in Taiwan and China.
H2: There are significant differences in employee playfulness in Taiwan and China.

Research Subjects

This study selects high-tech TFT-LCD industry Company C's direct employees from China and Taiwan as research subjects. The study is conducted with a pretest questionnaire and an official questionnaire, which are described as follows:

1. Sample subjects and sampling design for pretest questionnaire

In this study, the pretest questionnaire was given out and retrieved between November 26, 2012 and December 10,

Table 1. Release and retrieval of official questionnaires

Region	Questionnaires release	Questionnaires retrieved	Valid questionnaires	Valid retrieval rate
Taiwan	300	295	270	90.0%
China	700	583	497	71.0%
Total	1000	878	767	76.7%

Table 2. Personal Information, the number and percentage analysis table (N=767)

Sample analysis		Number Sample		Taiwan		China	
		n	%	n	%	n	%
Gender	M	317	41.3	77	28.5	240	48.3
	F	450	58.7	193	71.5	257	51.7
	overall	767	100	270	100	497	100
Marital status	unmarried	615	80.2	165	61.1	450	90.5
	married	152	19.8	105	38.9	47	9.5
	overall	767	100	270	100	497	100
Age	under 25	442	57.6	34	12.6	408	82.1
	26-30	195	25.4	114	42.2	81	16.3
	over 31	130	16.9	122	45.2	8	1.6
	overall	767	100	270	100	497	100
Working years	less than 1 years	194	25.3	16	5.9	178	35.8
	between 1 and less than 3 years	277	36.1	28	10.4	249	50.1
	between 3 and less than 5 years	167	21.8	101	37.4	66	13.3
	more than 5 years	129	17.2	125	43	4	0.8
	overall	767	100	270	100	497	100
Education levels	below high and vocational school	381	49.7	120	44.4	389	78.3
	beyond high and vocational school	386	50.3	150	55.6	108	21.7
	overall	767	100	270	100	497	100
Occupational distribution	production	679	90.4	257	95.2	422	84.9
	other	88	11.7	13	4.8	75	15.1
	overall	767	102	270	100	497	100

2012, over a period of two weeks. “Convenience sampling” was used to sample employees of Company C in Taiwan. The questionnaires were first given to assistants who aided in release and retrieval. The questionnaire excluded personnel in trial periods (less than 3 months). 210 questionnaires were released, 210 were retrieved (discarding 15 invalid questionnaires), resulting in 195 valid questionnaires, with a valid retrieval rate of 92.8 %. After retrieving the pretest questionnaire, reliability and validity analysis was carried out, finally revising it into the “official questionnaire.”

2. Sample subjects and sampling design for official questionnaire

Due to differences in word usage in Taiwan and China, before the official questionnaires were released in China, they were first converted to Simplified Chinese, then an e-mail was used to ask personnel in China to adjust the wording before the questionnaires were released. The official questionnaire was given out and retrieved between December 25, 2012 and February 10, 2013, over a period of six weeks. Random sampling was conducted within the factory based on differences in the ratio of people. At sampling, there were 4,200 from Taiwan and 10,000 from China, thus this ratio was used for questionnaire release. 300 questionnaires were released in Taiwan’s Company C, retrieving 295 questionnaires (discarding 25 invalid questionnaires), with 270 valid questionnaires and a valid retrieval rate of 90 %. 700 questionnaires were released in Company C in Ningpo, Zhejiang Province in eastern China, retrieving 583 questionnaires (discarding 86 invalid questionnaires), with 497 valid questionnaires and a valid retrieval rate of 71.0 %. A total of 1,000 questionnaires were released, retrieving 878 official questionnaires. Any incomplete questionnaires were deemed invalid, so 111 invalid questionnaires were discarded. There were a total of 767 valid questionnaires and a valid retrieval rate of 76.7%, as shown in Table 1.

Employee creativity scale

Measurement of employee creativity primarily uses the performance of creativity as the main indicator, including

Table 3. Descriptive Statistical Analysis of employee creativity in Taiwan and China (N=767)

Items	Taiwan			China		
	Mean	SD	Rank	Mean	SD	Rank
I would suggest using new methods to achieve objectives or goals	3.39	0.605	10	3.66	0.753	1
I would propose new and practical ideas to improve performance	3.75	0.666	6	3.66	0.744	1
I would actively search for new technologies, procedures, techniques, or products (services)	3.17	0.684	11	3.50	0.754	5
I would suggest new methods for improving quality	3.55	0.649	7	3.56	0.724	4
I am the best source of creative ideas	3.43	0.767	9	3.17	0.798	13
I am not afraid of bearing unknown risks	3.15	0.844	12	3.29	0.899	12
I would promote my ideas to others	3.00	0.743	13	3.65	0.715	3
I would grasp opportunities to demonstrate creativity in work	3.77	0.699	4	3.50	0.775	5
I would provide suitable plans and schedules to complete new ideas	3.81	0.704	3	3.49	0.707	7
I often have many new ideas and innovative thoughts	4.09	0.764	1	3.34	0.767	11
I can often propose new solutions for problems	4.04	0.742	2	3.44	0.739	9
I can often use new methods to solve problems	3.76	0.707	5	3.38	0.776	10
I often propose new methods to complete work	3.54	0.741	8	3.45	0.839	8

the proposal and implementation of innovative ideas and the improvement of performance, and the creativity measurement questionnaire by Zhou and George (2001) was cited to compile the questionnaire. The questionnaire has an internal reliability of 0.96, making it highly reliable. The scale contains 13 questions, which are scored using the Likert 5-point scale, with scores ranging from 1 to 5 for “highly disagree,” “disagree,” “neutral,” “agree,” and “highly agree.” Higher scores indicate that there is greater employee creativity.

Employee playfulness scale

The playfulness questionnaire in this study is based on the “adult playfulness scale” by Yu and Wu et al. (2003), which was modified in 2004 by Ping Yu, finally referring to Yu’s (2004b) “Adult Playfulness Scale (APS),” and is scored using the Likert 5-point scale, with scores ranging from 5 to 1 for “highly conforms,” “generally conforms,” “half conforms,” “somewhat conforms,” and “does not conform at all.” Higher scores indicate that there is greater employee playfulness. This scale has a reliability of 0.931.

Reliability analysis and testing of the scale

This study utilizes Cronbach’s α reliability coefficient to compute the reliability of the questionnaire constituted by the remaining questions. If α coefficient is high, it means that the internal consistency of the scale is high. Wu Minglong (2006) believed that in a scale or questionnaire with a good reliability coefficient, the total scale’s reliability coefficient should be greater than 0.80, and that it is acceptable between 0.70 and 0.80, but that the reliability coefficient of subscales should be better than 0.70. The dimensions of the employee creativity scale have a Cronbach’s α coefficient of 0.925; the dimensions of the employee playfulness scale have a Cronbach’s α coefficient of 0.966. This shows that the questionnaire is reliable, with good internal consistency, and that the scale can be used.

RESULTS OF DATA ANALYSIS AND DISCUSSION

The data obtained from the questionnaire were analyzed to understand differences in the background variables of employees in Taiwan and China, as well as their differences in terms of creativity and playfulness. First, this study analyzed the basic data, using frequency distribution to describe the sample in this study, in order to analyze the current conditions in employee creativity and playfulness in Taiwan and China. Next, t-test and one-way ANOVA were used to analyze the differences in employee creativity and playfulness in Taiwan and China.

Table 4. Descriptive Statistical Analysis of employee playfulness in Taiwan and China (N=767)

Items	Taiwan			China		
	Mean	SD	Rank	Mean	SD	Rank
Relaxation in body and mind, humorous and carefree	3.15	0.802		3.26	0.705	
When stressed or under pressure, I would joke or do something fun.	3.12	1.024	6	3.20	1.107	5
When facing a bottleneck of difficulties, I can still have a light and humorous attitude.	2.96	1.021	9	3.04	0.995	10
When I play, I dance if I am happy.	3.07	1.082	7	3.14	1.170	7
My body can express actions at ease and freely.	2.94	1.040	10	3.10	1.096	9
I like telling jokes and would share funny stories with others.	3.18	1.108	5	3.46	1.094	3
I would laugh heartily about funny things.	3.57	1.042	1	3.71	1.091	1
I do not mind clowning or being the butt of jokes.	3.22	1.061	4	3.20	1.167	5
Even though the work content is ordinary and uninteresting, I can find points to amuse myself and others.	3.07	1.018	7	3.00	1.087	11
I can accept harmless teasing by others, and would also joke with others appropriately.	3.29	0.971	3	3.32	1.114	4
I express cheerful emotions and countenances.	3.31	1.008	2	3.49	0.982	2
I think that I am a humorous person.	2.93	1.041	11	3.13	1.135	8
Enjoyment in work	3.60	0.904		3.84	0.809	
When I do something I like, I would think that time passes very quickly, even forgetting time.	3.69	1.094	2	3.99	1.014	1
When I do something I like, I would be fully immersed and forget myself.	3.56	1.078	5	3.78	1.051	5
When I do something I like, I would be fully focused and do my best.	3.65	1.038	3	3.89	1.019	3
When engaging in an activity, when I feel excited, I would want to continue without stopping.	3.57	1.006	4	3.80	1.007	4
I easily enjoy the process of doing something and can enjoy myself.	3.44	0.957	6	3.60	0.968	6
When I do something I am interested in, I would not feel that work is difficult.	3.71	0.958	1	3.94	0.964	2
Enjoyment in creativity and resolving problems	3.00	0.905		3.23	0.761	
Appropriate usage of resources at hand to create new combinations and applications.	3.07	1.025	2	3.29	0.940	2
I enjoy brainstorming and find it exciting.	3.02	1.106	3	3.10	1.117	4
I am happy to resolve problems and actively seek possible solutions and resources.	3.09	0.958	1	3.29	0.968	2
I have endless inspiration and am always at my optimal state.	2.81	1.008	5	3.03	1.005	5
I like challenging my own abilities.	3.02	1.070	3	3.44	0.963	1
Maintaining a childlike heart and the ability to have fun	2.93	0.974		3.14	0.936	
I think that I am a very playful person.	2.96	1.115	2	3.19	1.112	2
I think that I frequently have childlike and romantic ideas.	2.94	1.089	3	3.22	1.177	1
I think that I still have a childlike heart.	3.03	1.168	1	3.11	1.235	3
I think that I am able to make many things fun and interesting.	2.81	1.136	4	3.06	1.078	4
Self-perseverance and active completion of work	3.23	0.949		3.66	0.837	
I am eager to do the things I like.	3.42	1.045	1	3.69	1.040	1
I would actively complete what I want to do regardless of the views of others.	3.13	1.087	2	3.62	1.089	3
I would do what I like doing to reach the goal without regard for compensation or reward.	3.13	1.123	2	3.67	1.065	2

Finally, the empirical data on research hypotheses were analyzed.

Demographics

The distribution of background data in the 767 valid questionnaires in this study are shown in Table 2. In terms of the gender distribution of the subjects, 41.3% are male and 58.7% are female. Results show that there are more women than men in this study. There is a greater difference in the ratio of male employees in Taiwan (28.5%) and China (48.3%), which primarily results from a greater number of women involved in

Table 5. Differential analysis of employee creativity in Taiwan and China (N=767)

	Group	Samples	Means	t value
Employee creativity Overall	Taiwan	270	3.315	-3.904***
	China	497	3.470	

p<.05; ** p<.01; *** p<.001

Table 6. Differential analysis of employee in Taiwan and China (N=767)

	Group	number	Mean	t-value
Employee Playfulness overall	Taiwan	270	3.197	-4.030***
	China	497	3.398	
Relaxation in body and mind, humorous and carefree	Taiwan	270	3.151	-1.867
	China	497	3.255	
Enjoyment in work	Taiwan	270	3.604	-3.627***
	China	497	3.835	
Enjoyment in creativity and resolving problems	Taiwan	270	3.004	-3.685***
	China	497	3.231	
Maintaining a childlike heart and the ability to have fun	Taiwan	270	2.934	-2.92**
	China	497	3.144	
Relaxation in body and mind, humorous and carefree	Taiwan	270	3.227	-6.53***
	China	497	3.661	

p<.05; ** p<.01; *** p<.001

equipment operations and assembly work in products for the company. At present, there is a labor shortage in China, thus more male employees have been hired to make up the labor shortage. In terms of marital status, most in Taiwan (80.2%) and China (61.1%) are unmarried, and the ratio of married employees is lower. In terms of age distribution, most in Taiwan are 26-30 and over 31, at 42.2% and 45.2%, while in China most are under 25, at 82.1%. In terms of working years, most in Taiwan are between 3 and less than 5 years, or more than 5 years, at 37.4% and 43% respectively, while in China most are between 1 and less than 3 years, at 50.1%. This is because the factory was established in China in March 2005; thus, the years of working employees are shorter than those in Taiwan. In terms of the subjects' education levels, most Taiwanese employees are educated beyond vocational school at 50.3%, followed by those who have high and vocational school or below at 44.4%. Most in China have high and vocational school or below at 78.3%. In terms of occupational distribution, most in Taiwan and China are production personnel, at 95.2% and 84.9% respectively.

Description of current conditions of employee creativity in Taiwan and China

Table 3 shows subject perceptions of intrinsic rewards in work values. For Taiwan and China, the means of 3.75 and 3.76 are highest for "Obtaining new knowledge and techniques from work," followed by 3.55 and 3.62 for "working independently and autonomously", and lowest for perceptions of "can fully explore my career" at 3.00 and 2.96. In perceptions of extrinsic rewards, the highest mean for Taiwan is "It is similarly meaningful to do a good job and gain good rewards" with 4.09, and the highest mean for China is "people should be responsible in maintaining the regular course of work, regardless of whether his boss (supervisor) is nearby" with 4.16, while both Taiwan and China had the lowest perceptions for "if someone can be satisfied in his current work without concern for future promotion and new work, then he would be happier", at 3.40 and 2.66 with a significant difference. In perceptions of ability and responsibility, Taiwan's highest is "being responsible for one's own work" at 4.06, while China's highest is "being trustworthy

Table 7. Chart of verification results of the research hypotheses

Hypothesis	Content of research hypothesis	Verification results
H1	There are significant differences in employee creativity in Taiwan and China.	significant differences, established
H2	There are significant differences in employee playfulness in Taiwan and China.	significant differences, established

at work" at 4.12, while both Taiwan and China have the lowest perceptions of "insist on resting after completing work" at 3.60 and 3.62. In perceptions of rationality and accommodation, Taiwan's highest is "using an easygoing attitude to work with people" at 4.06, China's highest is "establishing good relationships with work partners" at 4.18. Taiwan's lowest perception is for "can patiently deal with issues in work" at 3.83, while China's lowest perception is for "seeing the completion of work as the merit of everyone" at 3.86. In perceptions of respect for tradition, Taiwan's highest is "abide by the hierarchy between supervisor and subordinate" at 3.94, China's highest is "emphasis on the virtue of frugality" at 3.95, and both Taiwan and China's perception of "emphasis on traditional work ethics" is lowest, at 3.84 and 3.18, with a significant difference.

Description of current conditions of employee playfulness in Taiwan and China

Table 4 shows the subjects' intrinsic satisfaction as part of their work satisfaction. For Taiwan and China, the highest rating is for "feelings toward education and training established by the company" at 2.99 and 3.19, while Taiwan has the lowest perception of "speed of advancement" at 2.49. China has the lowest perception of "comparison between compensation and existing workload" at 2.49. In terms of intrinsic satisfaction, Taiwan is significantly higher than China in terms of "comparison between compensation and existing workload," "my salary from the company," and "welfare measures of the company"; in terms of intrinsic satisfaction, China is significantly higher than Taiwan in terms of "the stability provided by this job," "feelings toward education and training established by the company," "feelings toward advancement opportunities of the existing job," "feelings toward the fairness of job advancement," and "speed of advancement." In perceptions of extrinsic satisfaction, Taiwan is highest for "the opportunity to serve other people in work" at 3.49, while China is highest for both "the opportunity for me to try different things in work" and "the opportunity to serve other people in work" at 3.45. Taiwan's perception is lowest for "the opportunity to express my abilities in work" at 3.18, while China's perception is lowest for "the social position and evaluations of others brought by my work" at 3.12. In terms of general satisfaction, Taiwan and China both had the highest views of "conditions of dealing with colleagues" at 3.74 and 3.70, while both Taiwan and China had lowest perceptions of "the way directors treat subordinates" at 3.03 and 3.20.

Differences in Taiwanese and Chinese employees in terms of employee creativity and employee playfulness

Differences in Taiwanese and Chinese employee creativity

Table 5 shows the t-test values for the differential analysis in creativity of Taiwanese and Chinese employees. In terms of employee creativity, employees in Taiwan and China show significant differences ($p < 0.05$), the mean employee creativity of Chinese employees is higher than that of Taiwanese employees.

H1: There are significant differences in employee creativity in Taiwan and China, established.

Differences in Taiwanese and Chinese employee playfulness

Table 6 shows the t-test values for the differential analysis in playfulness of Taiwanese and Chinese employees. In terms of employee playfulness, employees in Taiwan and China show significant difference ($p < 0.05$). Chinese employee playfulness is higher than that of Taiwanese employees. In the dimension of relaxation in body and mind, employees in China and Taiwan do not show significant differences; however, there are significant differences in terms of enjoyment in work, enjoyment in creativity, maintaining a childlike heart, and self-perseverance. The mean values for relaxation in body and mind, enjoyment in work, enjoyment in creativity, maintaining a childlike heart, and self-perseverance are lower for Chinese employees than for Taiwanese employees.

H2 : There are significant differences in employee playfulness in Taiwan and China, established.

Analysis and discussion of verification results for research hypotheses

After analyzing and verifying the hypothesis results based on statistics, the previous hypotheses are summarized in Table 7, to integrate the literature verification and discussion of the research results. The details are shown as follows.

Analysis of personal background data and current conditions shows that in the sample in this study, the factory has been in China for more than 10 years, but 85.9% of its direct employees have worked there less than three years, and there is less stability in personnel than in Taiwan. Most direct Taiwanese employees are educated beyond vocational school at 55.6%, and most in China have less education than vocational school, at 78.3%, which shows that Taiwanese employees are better educated than those in China. There are two reasons for this: 1) Since China's economy began to develop, there have been more choices in work opportunities, and more people in the labor force have turned to the service industry, resulting in an intense demand for salary and development, reducing their loyalty toward corporations. Furthermore, the influence of the "one-child policy" has reduced young and middle-aged people, whose parents do not want them to work far from home; 2) In addition, two recent policies, forcefully promoted by China, have been effective—"new rural infrastructure" and "new town infrastructure for rural villages." The former injected fiscal funding into rural villages, so that these areas have liquid capital, enabling farmers to engage in side businesses in addition to farming. The development of new towns allows for the children of farmers to remain in their native places and have many more opportunities to work outside of agriculture. This economic structural adjustment of "away from the land but not away from home" has resulted in serious shortages in coastal labor provisions, and this problem may become a long-term one, affecting the stability of personnel.

Research hypothesis 1: There are significant differences in employee creativity in Taiwan and China. Results: significant differences, established.

In terms of employee creativity, employees in Taiwan and China show significant differences ($p < 0.05$), the mean employee creativity of Chinese employees is higher than that of Taiwanese employees.

Research hypothesis 2: There are significant differences in employee playfulness in Taiwan and China. Results: significant differences, established.

In terms of employee playfulness, employees in Taiwan and China show significant differences ($p < 0.05$). The mean employee playfulness of Chinese employees is higher than that of Taiwanese employees. In the dimension of relaxation in body and mind, employees in China and Taiwan do not show significant differences; however, there are significant differences in terms of enjoyment in work, enjoyment in creativity, maintaining a childlike heart, and self-perseverance. The mean values are higher for Chinese employees than for Taiwanese employees.

Many recent studies have noted that playfulness plays an important role in work. Glynn and Webster (1992) have also asserted similar views. Their study of 300 adults residing in different areas of the United States found a positive correlation among playfulness, cognitive spontaneity, and creativity and reported that creativity can effectively predict work attitudes and performance. Creativity has frequently been connected to playfulness (Amabile, 1988; Liberman, 1977), and scholarly observations have shown that playfulness is indeed a necessary component of creative thought (Liberman, 1977). A creativity study conducted by Fix (2003) suggested a significant correlation between playfulness and creativity as well as a frequent conceptual overlap between the two notions. Taylor and Rogers (2001) observed 164 children and used qualitative data to demonstrate that playfulness and creativity may occur jointly. Fix (2003) noted that the personal expression of playfulness has a significant influence on creativity. Liu (1994) cited a study by Barnett (1991) to suggest a positive correlation between playfulness and infant creativity.

CONCLUSIONS

This study explained relevant research background and motivations about employee playfulness and creativity in the high-tech industry in Taiwan and China. There is a dearth of theses that explore differences in playfulness and creativity of employees involved in production for high-tech companies in Taiwan and China. The literature review was used to define employee playfulness and creativity, relevant theories, measurement tools, and relevant studies in Taiwan and China. The section on research methodology explains the framework, subjects, scale construction, and data analysis methods of this study. In terms of research results, this study used 767 grassroots direct employees in the high-tech industry as

subjects, primarily in order to understand the current conditions of employee playfulness and creativity in Taiwan and China, and also to explore differences in background variables and differences in employee playfulness and creativity in the two countries. This provides a more efficient referential basis for academia and Taiwanese corporate management in China. Thus, in sum of the previous deductions, literature, and statistical analysis, the specific conclusions are as follows:

1. In terms of employee creativity, employees in Taiwan and China show significant differences; Chinese employee creativity is generally higher than that of Taiwanese employees.
2. In terms of employee playfulness, employees in Taiwan and China show significant differences; Chinese employee playfulness is generally higher than that of Taiwanese employees. In terms of relaxation, Chinese and Taiwanese employees do not show significant differences. They do show significant differences in terms of enjoyment in work, enjoyment in creativity, maintaining a childlike heart, and self-perseverance.

Traditional Chinese people are very diligent and work-oriented, believing that hard work can result in material wealth and, in turn, happiness. They believe that if possible, each person should spend sufficient time and energy in work in order to have economic security and self-respect. In the minds of traditional Chinese people, work is more valuable than play; this belief has gradually changed in Taiwan and China. Young people today seek cheerful, stylish jobs. Compared to the past, they expect more from work, including more than just a salary. Compared to previous generations, their views on work and play have greatly changed. The different political and economic systems of Taiwan and China have also produced significant differences in culture, values, and behavioral models, resulting in different employee playfulness and creativity across the Taiwan Strait. There are indeed significant cross-cultural differences in human resource management ideals and corresponding management principles for the high-tech industry in Taiwan and China, which not only emphasize the playfulness and creativity of Chinese employees, but should also reflect changes in the playfulness and creativity of employees. Understanding and emphasizing the differences between them can be the basis for management methods suited to effectively lead and manage employees on either side of the Taiwan Strait, in a variety of contexts. This is because China is constantly changing. Corporate managers can understand employee performance in playfulness and creativity to elevate operational performance. It is hoped that the results of this study can help Taiwanese companies in China to be more efficient in operations and management, making them more competitive in a constantly changing environment.

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