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Patterns and structures of worry among college students in Hawaii and Japan

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This study presents a comprehensive conceptualization of the structure of worry and its effect on social anxiety. Six hundred and sixty male and female college students in Hawaii and Japan completed a quantitative questionnaire survey, and the data were analyzed using exploratory factor analysis (EFA). However, the unique pattern of worry structure in Japanese male students was different from the findings of the two-dimensional EFA results. Japanese male samples are more likely to be concerned first with their personal worry issues rather than social worry aspects. Because of the economic crisis and a lack of social trust in social capital, the Japanese male students are more likely to have a hard time obtaining full-time jobs and to have to endure the burden of social pressures related to the Japanese job hiring system. Overall, the data indicate that social factors such as quality of life, social capital, risks, illness, concern and worry have an impact on college students' health and well-being.

Key words: Culture, social anxiety, concerns, patterns and structures of worry, social factors.

INTRODUCTION

Worry is viewed as a multidimensional construct for people in society. This study will attempt to understand worry in health and well-being among the target population of college students in the U.S. and Japan. In order to do so, we not only need to look directly at how worry affects health and well-being, but we also need to examine the many social and cultural determinants of worry. Thus, this study focuses on some of the more important and promising utilities of social factors affecting worry.

Statement of problem

This study assesses worry and its effects on health and well-being. In its broadest sense, worry encompasses the physical, psychological, social, spiritual, and economic aspects of human life. It is an elusive, multidimensional, dynamic, and diverse concept that reflects ongoing res-

ponses to life events. Some researchers contend that physical and functional health and psychological, social, spiritual, and economic worry items are domains that constitute one's worry items. Researchers have examined this topic through various approaches, yet no universal consensus definition exists.

This study discusses concerns related to worry or concerns about lifestyle, health, and well-being. This study defines *worries* as uncontrollable thoughts about future outcomes that people perceive as negative or ambiguous and that are associated with negative emotions, such as anxiety, depression and fear.

This study attempts to develop a theoretical perspective on worries as explanatory variables as well as potentially dependent variables that could address individual health status, while at least partially dealing with definition and measurement issues. Because worry is a controversial and disputed issue, it warrants investigation.

Purpose and contributions of study

The purpose of this study is to gain a grounded under-

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standing of whether the relationships among worry items are stable in terms of health and well-being when examined across different cultures. Little research exists on the distinctions among these relationships across cultures. Initially, this study will review the literature regarding the worry items and social factors mentioned above. It will then examine college students in Hawaii and Japan via a quantitative strategy.

This study will attempt to explore the patterns and structures of worry items in male and female college students in Japan and Hawaii to determine how they are constructed and related. This study outlines the conceptualization of the structure of worry. Data from questionnaires are used to assess the students' ideas about the content, pattern, and structure of worry. This study uses exploratory factor analysis and examines the relationships among worry items as measured by the new instrument.

Significance of study

This study addresses the idea that both social and personal indicators are required to accurately examine and explore the impact of worry items. This approach is particularly appropriate for applications to larger participant groups in which health researchers are more likely to seek to clarify the domains, consistent elements, and underlying structure of the individual's experiences, in this case, relating to the individual's worry objects.

To the best of our knowledge and information, no comprehensive review on the concept of worry has employed and performed statistical analyses that explore the relationships specified by the analytical model, nor has a study of this concept employed and performed a quantitative approach. Moreover, by using this technique, the current study allows for a robust method of examining and exploring differences between the Hawaii and Japanese groups from a cross-cultural perspective. Thus, this study's results will enhance our understanding of the relationships among key patterns and structures of worry.

LITERATURE REVIEW

Patterns and structures of worry among college students in Hawaii and Japan

The concept of worry can be conceptualized as a subtype of anxiety or social anxiety that serves as an indicator of poor mental health and well-being (Meyer et al., 1990; Wisocki et al., 1986). In a significant departure from previous studies, this study focuses only on issues that help to develop a clear conceptualization of the content and structure of worry. Boehnke et al. (1998) developed a new concept of worry, "personal worry" that aims to identify the substantive content as well as the dynamic patterns and structures of relations among different types of worries. Moreover, the researchers developed a new

instrument for measuring individual differences in worries among the general public.

Anxiety, social anxiety and worry

Cognitive models ascribe an essential role to negative self-perception in the development and maintenance of social anxiety. In recent years, research has focused on detecting and deciphering cognitive biases among socially anxious or phobic individuals in their anticipation, recollection, and judgment of past and future social events. Although this approach has proven fruitful in elucidating the information processing errors that underlie social anxiety and social phobia (Clark and McManus, 2002; Heinrichs and Hofmann, 2001), it has been limited by its relative neglect of the broader "cognitive context" in which these processing errors may occur. Indeed, there has been scant research on the overarching self-schemas that impact the way socially anxious individuals organize and make sense of their social worlds.

Using event-contingent recording to assess social anxiety experiences, Lee et al. (2006) found that Asian Americans and European Americans reported similar *numbers* of anxiety-provoking events, but that Asian Americans reported more *intense* negative effect in reaction to these events. Lee and colleagues suggested that Asian cultural norms that discourage the *expression* of negative effect may reduce the frequency but enhance the intensity of negative effect.

Anxiety, which may be interchangeably called angst or worry, is defined as a psychological and physiological state characterized by somatic, emotional, cognitive and behavioral components (Seligman et al., 2001). The original meaning of the word anxiety is "to vex or trouble." Anxiety can be created from the feelings of fear, worry, uneasiness and dread from psychological and physiological stress (Bouras and Holt, 2007). Anxiety is treated with a normal reaction to a stressor. It may be helpful for an individual to deal with a demanding, stressful situation by coping with it. However, when anxiety becomes overwhelming, it may be classified as an anxiety disorder (National Institutes of Mental Health, 2008).

Social anxiety is defined as a discomfort or a fear (occurring when an individual is involved in social interactions) of being judged or evaluated by others (Jacobs, 2012). Social anxiety may be characterized by an intense, ego-driven fear of what others are thinking about them with regard to fear of embarrassment, criticism, or rejection, causing the individual to feel insecure and not good enough for other people. For anxiety and social anxiety concept explanations, social anxiety or anxiety arises when individuals are highly motivated to attain a particular social or personal goal and rewards, although they expect to fail in achieving that goal (Clark and Wells, 1995). An individual becomes socially anxious and begins to worry if the drive to create

a positive impression is coupled with high levels of self-doubt. Thus, if one factor of this coupling is lowered, it is less likely that high levels of social distress and depression, which affect health and well-being, will occur. For example, socially anxious individuals engage in behaviors that they believe will protect them from fearful social outcomes. Socially anxious and worrying individuals often try to protect themselves by being retiring and submissive, which they believe will prevent the unmasking of negative self-characteristics and the experience of social disapproval. The predictions partially rest on Western-based assumptions that revealing negative self-characteristics to others as well as being submissive and retiring can result in social failure. East Asians, however, unlike their Western counterparts, more readily endorse negative self-characteristics (Heine and Lehman, 1997, 1999) and prefer less dominant and more avoidant types of communication strategies (Kim, 1994, 2002). The strategies and behaviors that seem to be unfavorable to Westerners may be socially advantageous to East Asians.

Worry is considered to be thoughts, images and emotions of a negative nature, in which mental attempts are made to avoid anticipated potential threats (Borkovec, 2002). For example, as an individual emotion it is experienced as anxiety or concern about a real or imagined issue: personal issues such as health or finances or broader ones such as environmental pollution and social or technological change. Most people are likely to experience their short-lived periods of worry in their lives without incident; indeed, worrying state seems to have positive effects, if it prompts people to take precautions (example, fastening their seat belt or buying fire insurance) or avoid risky behaviors (example, angering dangerous animals, or binge drinking).

Worry scales or concepts are sometimes used interchangeably as subtypes of social anxiety or anxiety with anxiety measures (example, the various indices of anxiety, depression and psychosomatic symptoms). Worry may be categorized according to the topic or domain of life it refers to. For example, Tallis et al. (1992) sampled items to represent six life domains, and others have suggested anywhere from four (Barlow, 1988) to ten (Eysenck and Berkum, 1992) life domains. In these approaches, worrying can be seen as potentially domain specific. However, previous studies lack a clear concept and definition of worry that differentiates it from other related concepts. Although there is no consensus on either the concept or content of worry, clearly the object and domain of life should be included in any conceptual definition. The nature of the data used in this study limits the approach to the conceptualization of worry.

Cross-cultural comparison

Intra-cultural communication is defined as the communi-cation between interactants sharing the same cultural background. On the other hand, intercultural communi-cation is when the interactants come from different cultures. During intra-cultural communication, the interacttants are able to implicitly share the same ground rules of communication and interaction. However, in inter-cultural communication this is often not the case. The uncertainty and ambiguity concerning the ground rules by which this interaction occurs is one of the unique aspects, and involves the meaning of signals (Gudykunst and Nishida, 2001). Intercultural interactants are involved with each other through verbal language. As a result, at least one interactant is not communicating in a native language, and sometimes this may be for both individuals, thus creating intrinsic uncertainty in the meaning of the words. Cultural differences in the use of all nonverbal channels produce uncertainty in the messages as well.

From an intercultural communication perspective, for example, self-construals are overarching schemata that define how individuals relate to others and the social context. On the basis of cross-cultural research, Markus and Kitayama (1991) suggested that members of American and other individualistic societies tend to construct and promote independent self-construals, which are characterized by one's tendency to view oneself as autonomous and separate from the social context. An individual possessing an independent self-concept is motivated to uphold and validate one's own unique, internal attributes and goals, and one's self-esteem is derived from an ability to distinguish oneself from other people in one's environment. In contrast, members of Asian and other Eastern cultures are more likely to value and possess interdependent self-construals, which are based upon viewing oneself as being intricately connected and integrated with others in the social group. Interdependent people view the self as an extension of the social group to which they belong. To this end, they strive to maintain harmony in various interpersonal relationships by being attentive to and adjusting their behavior to correspond appropriately with the thoughts, feelings and behavior of other important people (Kitayama et al., 2000).

Research has demonstrated that interdependence is positively, and independence negatively correlated with embarrassability (Singelis and Sharkey, 1995) and fear of negative evaluations.

(Okazaki, 1997), both of which are important elements of the symptomatic expression of social anxiety and social phobia (APA, 1994). Singelis and Sharkey (1995) proposed that being interdependent may engender an acute awareness of the social context and sensitivity to evaluation by others, while being independent may "gird people in the face of these evaluations".

Similarly, Okazaki (1997) suggested that highly interdependent people might be more highly attuned to social cues and the experiences of social anxiety than

individuals who score low on this dimension. This hypothesis was confirmed in a cross-cultural study that examined the relationship between self-construals and social anxiety symptoms among American and Japanese university students (Dinnel et al., 2002).

Conceptualizing and defining micro and macro worries

The number of domains or dimensions in the worry concept varies based on the particular instrument; however, worries generally relate to (1) the object whose welfare is threatened (example, self, in-group, society, world) and (2) the domain of life to which a worry refers (example, health, environment, economics, achievement and work, social relations, economics, meaning) (Boehnke et al., 1998).

Boehnke et al. (1998) developed a domain and object of worry in which both are independently conceptualized. For example, according to a domain of safety, one could worry about being a victim (self), one's family members or friends being injured in an auto accident (in-group), an increasing national and environmental crime rate (society), or an international and global nuclear cataclysm and environmental carbon dioxide emissions (world). According to a (or "the," depending on your understanding) domain of achievement, one could worry about an exam or paper failure from academic perspectives (self), a parent's or partner's income or job difficulties (in-group), declining national academic achievement and failure (society), or misuse of scientific knowledge at international and global levels (world) (Boehnke et al., 1998).

As previously stated, this study, overall, aims to explore what the worry item patterns and structures are constructed. A subordinate aim is to explore what implications, if any, these definitions have for assessing the worry concept. Facet theory—a meta-theory that includes top-down, *a priori* methods for specifying formal definitions, structural hypotheses, and nonmetric data-analytic techniques—was chosen as the meta-theoretical approach here for four reasons. First, a precise, formal definition of constructs, and a method for their analysis and specification (mapping sentence) is central to facet theory. Second, multivariate structural hypotheses may be formed based on these formal definitions. Third, facet theory via mapping sentences facilitates the design of observations that systematically cover the domain of the target construct with minimal ambiguity. Fourth, facet theory's associated data-analytic method; the smallest space analysis (SSA) (Borg and Shye, 1995) provides a means of testing the correspondence between empirical observations and the structural hypotheses that were, in turn, based on the formal definition. If supported, the definitions and structural hypotheses have implications for assessing the construct of interest (Boehnke et al., 1998).

This study examines the patterns and structures of worry items in male and female college students in Japan and Hawaii. This study outlines the conceptualization of the structure of worry and its effect on social anxiety. Data from questionnaires are used to assess the students' ideas about the content, pattern, and structure of worry. This study uses nonmetric multidimensional scaling and examines the relationships among worry items as measured by the new instrument. In brief, in this study, micro worry is defined as the concerns or worries at individual relationships at the personal or individual levels. Macro worry is defined as concerns or worries at social and world/international relationships at the social and world/international relationships. Most worry scales seem to be focused on personal worry items, which refer to social relationships in social interactions and not to social or world perspectives of worry items. Worry conceptualization should be regarded not only from a personal perspective, but also from social or world perspective. To address both aspects of worry in our worry conceptualization (personal worry (micro-worries) and social worry (macro-worries), which is our research aim and purpose; we select the worry questionnaire that includes both personal and social worries.

Research questions

This paper provides a quantitative analysis that examines the structure of worries of Hawaiian and Japanese students using gender-based samples. Before examining the influences of worries, the first necessary step is to understand the structure of worries, identifying the salient clusters, and discovering whether these clusters were similar or different across different cultural groups and genders.

RQ1: Does the concept of worry have the two objects of worries and the seven life domain worries?
RQ2: How stable are the underlying structures of worry when examined across different cultures?

METHODOLOGY

Procedure

The first author visited a number of classrooms at the two universities to solicit participation in this study. Volunteers were recruited in compliance with human subjects' regulations. Moreover, they were permitted to withdraw from the study at any time and were assured anonymity. Then, they were asked to complete self-report measures after reading their respective questionnaires. It is important to note that the language in the questionnaires developed for the Japanese sample was translated and back-translated by a bilingual professional to ensure cross-cultural equivalence in meaning (Brislin, 1970). English and Japanese versions of the questionnaire and consent forms were used in this study.

Statistical analysis

The descriptive statistics, exploratory factor analysis (EFA) and

scale reliability tests such as Cronbach's alpha were performed. Statistical analysis was used to predict models of the worry items. The analysis first examined whether the self-related worry scores reported by respondents distinguished two facets: the four objects of worry (self, close to others, society, and the world) and the seven domains of worry (health, safety, environment, social relations, meaning in life, achievement in work and studies and economics).

Measurement instrument

This study adopted the concept and definition of worries proposed by Boehnke and colleagues. Moreover, this study used the *Worry Questionnaire* produced by Boehnke and colleagues. According to Boehnke and colleagues. the *Worry Questionnaire* is constructed from two objects (micro and macro) and seven life domains (health, environment, social relations, meaning, achievement and work, economics, and safety).

For each item in this questionnaire, the participants rated their level of worry concerning each statement using an instruction and a 5-point response scale, ranging from 0 (not at all worried) to 4 (considerably worried). Respondents were asked to indicate how important the items were to a college student's concerns or worries. The questionnaire was divided into seven subscales (health, social relations, economics, environment, safety, achievement, and health/safety). Additionally, based on Boehnke and colleagues. one question ("Simply about the future") was not specifically categorized for macro or micro items. In this study, demographic questions were included: ethnic or racial background, cultural background, whether the student was born in the USA or in Japan, native language, age, gender, major, year in school, and whether the student works or not.

RESULTS

Participants

There were a total of 660 undergraduate students engaged in this study project. All questionnaires were collected on university campuses in Hawaii and Japan. This study used a cross-sectional survey research design. For both samples from Hawaii and Japan, the average time for administration of the worry scale instrument questionnaire survey was 12.5 min. In Hawaii, the questionnaire was conducted in English with a mixed and heterogeneous sample of 363 male and female college students from the University of Hawaii at Manoa, Honolulu. In Japan, the questionnaires were conducted in Japanese with a homogeneous sample drawn from an urban university. The sample consisted of 297 Japanese male and female college students who were attending Reitaku University (located in Kashiwa-City, Chiba Prefecture, near metropolitan Tokyo). Both English and Japanese versions of the instrument questionnaire and consent forms were used in this study. The worry scale instrument questionnaire data were gathered in 2008–2009 from undergraduate students who were sociology majors or had taken or were taking a sociology course at the University of Hawaii at Manoa in Hawaii and Reitaku University in Japan.

Participants in this study were recruited from the University of Hawaii at Manoa and Reitaku University in Kashiwa-City, Japan (near Tokyo). The group consisted of 363 college students at the University of Hawaii at Manoa (mean age = 22 years, SD = 6.3, 42% male, 58% female); and 297 college students at the Reitaku University (mean age = 20 years, SD = 5.0, 28% male, and 72% female). A total of 504 questionnaires were distributed at the University of Hawaii at Manoa, and 363 of those questionnaires (72% collecting rate) were returned. A total of 350 questionnaires were distributed at the Reitaku University, and 297 questionnaires (85% collecting rate) were returned.

In demographics, the ethnic or racial backgrounds identified by participants from the University of Hawaii at Manoa included: Caucasians (18%), Japanese (21%), Filipinos (13%), Hawaiian or part Hawaiian (13%), Chinese (5%), Korean (3%), Black (1%), Samoan (5%), mixed without Hawaiian (8%), Hispanic (3%), and others (6%). On a 7-point scale, participants had an average score of 5.2 regarding the extent to which they identified with their ethnic or racial background. Self-identified cultural backgrounds included: Mainland U.S. (23%), Japanese (9%), Filipinos (7%), local from Hawaii (41%), Chinese (3%), Korean (1%), African-American 2%, Pacific Island (6%), Hispanic (1%), others (5%), and missing (2%). The ethnic or racial backgrounds identified by participants from the Reitaku University included: Japanese (91%), Chinese (4%), Korean (2%), mixed (1 percent), others (1%), and missing (1%). From the 7-point scale, participants had an average score of 3.7 regarding the extent to which they identified with their ethnic or racial background. Self-reported cultural backgrounds included: Japanese (93%), Chinese (3%), Korean (2%), others (1%), and missing (1%). Participation was voluntary.

Unique sample in Hawaii

In order to address the cross-cultural perspectives and explore the non-Western cultural worry patterns and structures, we decided to use college student samples in Japan and Hawaii. Specifically, the unique Hawaii sample was from a large public higher educational institution. Hawaii provides a unique sample in the sense that it is illustrative of a pluralistic cultural environment with a predominantly Asian and Pacific Islander population. The variety of ethnicity and cultural backgrounds in this study was useful for the purpose of exploring potential cultural factors in the formation of behavioral intentions, and to shed light on further applications and investigations. Moreover, conducting this study among a group with mixed racial or ethnic origins provides insight regarding "culture and self" as well as cultural orientation.

Exploratory factor analysis

In the quantitative questionnaire, two research questions

were addressed in the analysis. The questions explored and examined how the concepts of health and well-being are related to other social concepts such as risk, illness, concern or worry, quality of life, self-concept and social capital, as well as how stable these relationships are when examined across different cultures.

First, the EFA with two dimensions were conducted. For both the male and female samples in Hawaii, according to the variance explained factor, Factor 1 (accounting for 34% of the variance) contained 17 macro items from health, economic, social, meaning, achievement and environment issues. Factor 2 (accounting for 9% of the variance) contained 16 items, which were composed of 15 micro items from health, economic, social, meaning, achievement, environment, and safety issues as well as 1 unspecified item between the macro and micro worry aspects: "Simply worry about the future." For the female sample in Japan, Factor 1 (accounting for 32% of the variance) contained 23 items composed of 17 macro items from health, economic, social, meaning, achievement and environment issues as well as six micro items from safety, economic, and health issues. Factor 2 (accounting for 9% of the variance) contained 10 items comprised 9 micro items from health, economic, social, meaning, achievement, environment and safety issues as well as 1 unspecified item between the macro and micro worry aspects: "Simply worry about the future."

By contrast, for the male sample in Japan only, according to the variance explained factor, Factor 1 (accounting for 30% of the variance) contained 16 items comprising 15 micro items from health, economic, social, meaning, achievement and environment issues, as well as one unspecified item between the macro and micro worry aspects: "Simply worry about the future." Factor 2 (accounting for 9% of the variance) contained 17 items, which comprised 16 macro items from health, economic, social, meaning, achievement, environment and safety issues, as well as one micro item from the social relations category.

Briefly, for all cases in Hawaii and the female cases in Japan, overall, according to the variance explained factor, Factor 1 was constructed by worries or concerns about health, economic, social, meaning, achievement and safety issues for macro objects from society or world perspectives in Hawaii and Japan. Factor 2 was constructed by worries or concerns about health, economic, social, meaning, achievement, and safety issues and one unspecified item between macro and micro objects ("Simply worry about the future") for micro objects from the self or in-group in Hawaii and Japan. Therefore, Factor 1 is called "macro worries or concerns" in Hawaii and Japan, and Factor 2 is called "micro worries or concerns" in Hawaii and Japan.

By contrast, for the Japanese male sample only, a different and unique factor pattern emerged about the worry structure in health and well-being. Particularly, for the variance explained factor of Japanese male sample, Factor 1 was constructed by worries or concerns about health, economic, social, meaning, achievement and safety issues for micro objects regarding one's self or close relationships. Factor 2 was constructed by worries or concerns about health, economic, social, meaning, achievement and safety issues in regard to the larger community and world, and one unspecified item between macro and micro worry aspects ("Simply worry about the future") for macro objects from society or the world. Therefore, Factor 1 is called "Japanese male macro worries or concerns." Factor 2 is called "Japanese male micro worries or concerns." Cronbach's alpha was used to test the internal consistency reliability of each subscale of Factors 1 and 2. The alpha scores for Factor 1 ranged from 0.85 to 0.92.

The findings of the exploratory factor analyses are shown in Tables 1 and 2. Specifically, question 33, "Simply worry about the future," was included in the micro items in this study because this item is not specified between macro and micro worry. This study suggested that a similar pattern of factors from micro and macro worries or concerns be applied for the college students in Hawaii and Japan, except for the Japanese male sample.

In summary, this study mainly revealed two distinct dimensions of macro and micro worry or concern objects. The EFA with ProMax rotation of the two-dimensional solutions produced a similar pattern among the male and female samples in Hawaii and the male sample in Japan. These samples were clearly divergent regarding the types of micro and macro worries. The two-dimensional solutions with the EFA provided substantial cross-cultural similarity and applicability and validity of the samples in Hawaii and Japan as well as gender applicability and validity of samples in Hawaii. Moreover, this finding supports the theory that worries are differentiated for an object facet consisting of two elements, micro and macro. However, for the Japanese male sample only, regarding the variance explained factor, a different and unique factor pattern emerged about the worry structure in health and well-being. The factors correspond to the worry item scales of Boehnke and colleagues.

Overall, to answer RQ1, factor solution in EFA provided two micro and macro worry objects, produced two micro and macro worry objects and the seven life worry domains of safety, environment, social problems, safety and health, social, meaning, achievement, and economics (Boehnke et al., 1998; Schwartz and Melech, 2000). The finding of the factor solution in EFA supported RQ1 and identified the worry pattern and structure from the two worry domains and the seven life worry domains.

Moreover, to answer RQ2, for the male and female samples in Hawaii and Japan across cultures produced two micro and macro worry objects and the seven life worry domains mentioned earlier (Boehnke et al., 1998; Schwartz and Melech, 2000). The findings supported RQ2 and identified similar cross-cultural patterns and

Table 1. Dimension solutions of pattern matrix in Hawaii.

Hawaii male	Factor 1	Factor 2	Hawaii female	Factor 1	Factor 2
Macro Environment 1	0.870	−0.380	Macro Environment 1	0.870	−0.380
Macro Health 1	0.776	−0.077	Macro Health 1	0.776	−0.077
Macro Safety 1	0.731	−0.063	Macro Safety 1	0.731	−0.063
Macro Environment 2	0.726	−0.114	Macro Environment 2	0.726	−0.114
Macro Social 2	0.716	−0.104	Macro Social 2	0.716	−0.104
Macro Environment 3	0.712	0.012	Macro Environment 3	0.712	0.012
Macro Safety 3	0.686	0.168	Macro Safety 3	0.686	0.168
Macro Achievement 2	0.670	−0.021	Macro Achievement 2	0.670	−0.021
Macro Achievement 1	0.625	0.047	Macro Achievement 1	0.625	0.047
Macro Safety 4	0.621	0.161	Macro Safety 4	0.621	0.161
Macro Safety 2	0.609	0.229	Macro Safety 2	0.609	0.229
Macro Economics 1	0.599	−0.067	Macro Economics 1	0.599	−0.067
Macro Social 1	0.582	−0.136	Macro Social 1	0.582	−0.136
Macro Economics 2	0.564	0.160	Macro Economics 2	0.564	0.160
Macro Environment 4	0.562	0.051	Macro Environment 4	0.562	0.051
Macro Health 2	0.529	0.230	Macro Health 2	0.529	0.230
Macro Meaning 1	0.431	0.111	Macro Meaning 1	0.431	0.111
Micro Social 3	−0.183	0.818	Micro Social 3	−0.183	0.818
Micro Achievement 1	−0.085	0.710	Micro Achievement 1	−0.085	0.710
Micro Social 2	−0.245	0.701	Micro Social 2	−0.245	0.701
Not Specific	0.009	0.693	Not Specific	0.009	0.693
Micro Achievement 2	−0.017	0.693	Micro Achievement 2	−0.017	0.693
Micro Safety 1	0.084	0.688	Micro Safety 1	0.084	0.688
Micro Social 1	−0.130	0.670	Micro Social 1	−0.130	0.670
Micro Meaning 2	0.005	0.659	Micro Meaning 2	0.005	0.659
Micro Meaning 1	−0.184	0.614	Micro Meaning 1	−0.184	0.614
Micro Economics 2	0.139	0.609	Micro Economics 2	0.139	0.609
Micro Health 3	0.129	0.586	Micro Health 3	0.129	0.586
Micro Health / Safety 1	0.082	0.569	Micro Health / Safety 1	0.082	0.569
Micro Health 2	0.218	0.563	Micro Health 2	0.218	0.563
Micro Safety 2	0.285	0.501	Micro Safety 2	0.285	0.501
Micro Health 1	0.182	0.408	Micro Health 1	0.182	0.408
Micro Economics 1	0.314	0.334	Micro Economics 1	0.314	0.334

structures of the worry concept with respect to the two macro and micro worries and seven life domains. However, the two-dimensional solutions with EFA identified the Japanese male unique pattern and structure of worry construct.

DISCUSSION AND CONCLUSION

This exploratory research aimed to understand the relationships, patterns and structures of worry items for college students in Hawaii and Japan. Previous research such as that of Boehnke and colleagues focused on European cultures, not non-European cultures. This study was focused on how the worry item patterns and structures are correlated, constructed, and applied into non-Western culture, such as Japanese culture. The contributions of this exploratory research were to provide non-European cultural model, such as a Japanese cultural model.

Objects

From the EFA findings with two-dimensional solutions, this study confirms that the macro or micro object facet with two dimensions is shown to be more important than the life domain. The results imply that the respondents experience a set of micro worries as sharing a common meaning and a set of macro worries as sharing a different common meaning. In addition, the empirical separation or difference implies that the different patterns of the worry structure are influenced substantially by whether their object is the self and its extension (micro) or wider

Table 2. Two dimension solutions of pattern matrix in Japan.

Japanese male	Factor 1	Factor 2	Japanese female	Factor 1	Factor 2
Not Specific	0.855	−0.095	Macro Safety 3	0.841	−0.139
Micro Achievement 2	0.808	−0.070	Macro Environment 4	0.775	−0.145
Micro Meaning 1	0.755	−0.282	Macro Health 1	0.774	−0.083
Micro Meaning 2	0.711	−0.206	Macro Environment 2	0.764	−0.331
Micro Economics 2	0.705	−0.111	Macro Social 2	0.703	0.060
Micro Social 3	0.633	0.071	Macro Safety 4	0.702	0.045
Micro Social 2	0.630	0.036	Macro Health 2	0.661	−0.039
Micro Social 1	0.619	−0.025	Macro Safety 2	0.658	0.057
Micro Health / Safety 1	0.605	0.188	Macro Environment 1	0.656	−0.230
Micro Safety 1	0.575	0.119	Macro Meaning 1	0.638	0.044
Micro Achievement 1	0.529	0.202	Macro Safety 1	0.599	0.027
Micro Economics 1	0.478	−0.031	Micro Health 2	0.571	0.115
Micro Health 3	0.406	0.221	Macro Achievement 1	0.525	0.111
Macro Social 2	0.346	0.344	Macro Economics 1	0.500	0.117
Micro Safety 2	0.320	0.204	Micro Safety 2	0.495	0.284
Micro Health 1	0.301	0.264	Micro Safety 1	0.484	0.199
Macro Environment 2	−0.295	0.892	Macro Achievement 2	0.477	0.187
Macro Environment 1	−0.135	0.797	Micro Economics 1	0.448	0.207
Macro Achievement 1	0.034	0.663	Macro Environment 3	0.445	0.102
Macro Environment 3	−0.201	0.651	Macro Social 1	0.435	0.130
Macro Social 1	−0.173	0.650	Macro Economics 2	0.346	0.258
Macro Environment 4	0.013	0.636	Micro Health 1	0.325	0.208
Macro Safety 2	0.104	0.581	Micro Health 3	0.262	0.252
Macro Health 2	−0.063	0.560	Micro Social 2	−0.186	0.887
Macro Safety 4	0.162	0.554	Micro Meaning 2	−0.076	0.824
Micro Health 2	−0.037	0.537	Micro Meaning 1	−0.203	0.752
Macro Achievement 2	0.202	0.514	Micro Achievement 1	0.011	0.717
Macro Economics 2	0.164	0.491	Not Specific	0.004	0.651
Macro Health 1	0.186	0.445	Micro Achievement 2	0.139	0.539
Macro Safety 1	0.146	0.419	Micro Economics 2	0.237	0.532
Macro Economics 1	0.320	0.417	Micro Social 3	0.195	0.516
Macro Meaning 1	0.235	0.379	Micro Social 1	−0.043	0.495
Macro Safety 3	0.325	0.340	Micro Health / Safety 1	0.261	0.364

society and the world (macro).This study may explain that, logically, people who worry about their own health, income, or better physical and psychological status and well-being may not particularly worry or be concerned that others in society or in the world are living in poverty, dying of hunger, or suffering from population expectations, environmental pollution and global warming. Nonetheless, these two types of worry (macro and micro) still correlate with one another, particularly in regard to concerns about health and safety (Boehnke et al., 1998; Schwartz and Melech, 2000). In addition, worries about personal economic success are consistently compartmentalized from worries about relationships and the meaning of life within the micro field. The EFA shows that irrelevant of people's overall level of worry, they do discriminate, differentiate, or separate between micro and macro worry objects. People tend to be more consistent within the sets of micro worry objects than between these sets. Based on the findings, our agenda is to expand the findings and conduct further research into worry objects (Boehnke et al., 1998; Schwartz and Melech, 2000).

This study suggests that the object facet, specifically the micro and macro distinction as found in this study, is more important than the life domain to which the object facet relates. This study shows that micro and macro worries differ in their effect; however, no research has demonstrated the differences in worry resulting from varying life domains. This study indicates that both macro and micro worries objects lead to systematic individual differences in response, regardless of the specific domain of life to which the worry refers and regardless of the average different patterns of that worry structure in the

sample. This study also indicates that additional worry objects may be linked to social support and personal networks.

Life domains

Using two-dimensional EFA analysis, it is found that the life domains contributed less to the different patterns of people's worry structure than the objects. In other words, life domains are less likely to have different patterns of worry structure than objects do. The distinction and differentiation of the life domains were subordinate to the object distinction. The findings in this study show and explain that the life domain of worry has a meaningful and important role. However, this finding may also explain and show a simpler set of distinctions than originally proposed by Boehnke and colleagues. One may compare the levels of worry across cultures regarding environment, social issues and problems, public safety, people's personal health and safety, social issues and problems, social relationships, socioeconomic status success, and the meaning of life and the future (Boehnke et al., 1998; Schwartz and Melech, 2000). This study concludes that these factor patterns show and explain the sufficient complexity for an initial examination and exploration of cross-cultural similarity and applicability and validity in worry between Hawaii and Japan.

However, as the results also imply, a few life domain worries are consistently treated as distinct in the analyses. Respondents may not always express the distinction between life domains. If future research shows similar results, it may also be possible to simplify the examinations and investigations regarding the life domain objects. Conceptually, life domain objects seem to be closely related to each other. This meaning may suggest that these worry objects may share a common core meaning and may be viewed as a broad, consistent set. The core meaning may refer to the social issues and social problems about intergroup conflict, crime, poverty, unemployment and drugs. The findings in this study may suggest and indicate that the life domain object of worry is also meaningful. However, this study's scope and perspective were limited to the more basic worry objects of micro and macro distinction, as this suggested sufficient complexity with regard to an initial examination of cultural differences in relation to worry.

In brief, EFA as used to determine if there were sufficient gender and cross-cultural similarities in understanding and motivation, and whether measurement of worries would allow meaningful gender comparisons to be made. However, the unique pattern of worry structure in Japanese male students was different from the other sample findings of the two-dimensional EFA results. For the male sample in Japan only, according to the variance explained factors, Factor 1 (accounting for 30% of the variance) contained 16 micro worry items, and Factor 2 (accounting for 9% of the variance) contained 17 macro items. That is, probably Japanese male samples are more likely to be concerned with the personal worry issues in their lives rather than macro worry aspects. Because of the economic crisis as well as a lack of trust in social capital leading to *muen shakai*, which refers to having no relationship with society, the Japanese male students are more likely to have difficulty in obtaining full-time jobs as well as having the burden of social pressures and social stress related to Japanese society's job hiring system. This puts special stress on new employees coming straight out of college, with the burden of the role of male in Japan for job hiring adding extra pressure. This study identified the gender differences in Japan and cultural differences between Japan and Hawaii.

This study also identified how the results would be linked to social anxiety. For Japanese male student samples, Factor 1 is called micro worries (personal worries). It may explain that Japanese male student samples are likely to have difficulty to obtain a full-time job due to the competitive Japanese job hiring system. If it is difficult to obtain a full-time status job, they may not be considered to be "independent" in Japan. Obtaining a job is a key life step and is necessary for social interaction with others. Japanese society, in which gender inequality problems have emerged, places social burdens and pressures on Japanese male students more than on Japanese female students. As a result, our study identified that while Japanese male students are likely to obtain full-time jobs, they seem to feel social anxiety, which is a discomfort or a fear (occurring when an individual is involved in social interactions) of being judged or evaluated by others (Jacobs, 2012). Moreover, in relation to the concept of worry, our study identified while Japanese male students are likely to feel worry, as an individual emotion it is experienced as anxiety, social anxiety, or concern about a real or imagined issue, personal issues such as health or finances or broader ones such as environmental pollution and social or technological change.

Contributions

To explore the worry patterns and structure items constructed for college students in Japan, this study took a quantitative approach. From social and health research perspectives, this study contributes to the social ecological framework of college students in Hawaii and Japan by using quantitative findings to demonstrate a similar pattern and structure of worry objects (example, macro-micro) among college students across cultures. Specifically, our study provided non-Western cultural worry patterns and structures in the form of exploratory research. The quantitative findings illustrate how the sig-

nificant social factors of worry items correlate each other with cross-cultural framework. As such, this study added to the growing social and health research literature on social factors of worry in health, with specific application to the complex relationship between socio-economic change, on the one hand, and health and well-being, on the other hand, in Hawaii and Japan in a cross cultural framework.

Limitations and future directions

A major limitation in the quantitative research method of this study is the sample size for the questionnaire. This limitation is related to both statistical and substantive factors that contribute to the generalizability of a study (Jaeger, 1988). The majority of participants in Japan were from one institution, Reitaku University, Kashiwa-City, near central Tokyo, while the majority of participants in Hawaii were from one institution, the University of Hawaii in Manoa, Honolulu. Obviously, the small number of participants threatens the external validity of the results. However, participants in this study showed fairly dramatic differences, thus supporting the notion that the importance of the dimensions for participants may vary based on the research method technique. In an effort to compensate for the small sample size, this study asked instructors to distribute the questionnaires equally between males and females. Nonetheless, more female students than male students participated in some classes. Thus, it should be noted that a study with more male participants might produce different importance levels and different multidimensional scaling solutions.

Another limitation in the quantitative research method of this study is the exploratory factor analysis (EFA). A case can be made for using an exploratory method, given that (a) there is no translated English literature regarding college students in Japan, which may have given rise to translation errors and caused respondents to find the task alien or non-compelling; (b) there is no literature pertaining to reduction of worry objects to a smaller number of groupings; (c) there is no literature regarding usage of Boehnke and colleagues' *Worry Questionnaire* in either country with a college student sample. Each situation discussed here limits the generalizability of this study. Thus, while the participating students in Hawaii and Japan may have been representative of the populations from which they were drawn, the results of this study cannot be readily generalized to other populations of college students within either the U.S. or Japan.

Again, in the context of quantitative research, the theoretical premises of worry outlined are instrumental in accomplishing the second purpose of this study: to briefly explain the worry theory that defines health and well-being. Critics may argue that much of what is important in individual life is missing from the theory—the study does not include religion, religious beliefs and practices, or spirituality, nor does it examine group stability, cohesion and goals, activities, or rituals that strengthen individual life—and thus that it does not accurately reflect health and well-being. These criticisms are valid, but the domain of individual life is extremely complex. It is near impossible for any one theory, or even several theories, to adequately outline the content or domain of an individual life. Theories provide a focus for inquiry, but any focused inquiry automatically has a selective view of the content domain. The present study supports the idea that worry theory offers more advantages than disadvantages as a way of developing indicators of health and well-being.

Implications

Culture may play a significant role in the experience and reporting of anxiety, depression, and well-being caused by social behaviors. The principal values in this context are associated with the culture of self-criticism, self-improvement, and mutually sympathetic relationships, which tend to be related to self-control, self-regulation, functionality, effort, social role, filial piety, community values, warm-heartedness, empathy and perspective-taking. The initial evidence suggests that in the Japanese cultural context, these attitudes and orientations are often necessary for personal achievement because they can lead to the recognition of one's shortcomings and therefore, the initiative to work hard (Heine and Lehman, 1999; Kitayama et al., 2000). Furthermore, a self-critical attitude and orientation to anxiety, depression, and health and well-being enable the individual to fully participate in mutually sympathetic social relations (Kitayama and Markus, 2000; Kitayama et al., 2000).

Although, shame is likely to play an important role in any culture, a particular emphasis has been placed in the literature on the relationship between shame and the Asian culture (Xu, 1982). A study examining the cross-cultural differences of the effects of shame and personality on social anxiety supported this notion (Zhong et al., 2008). This study administered the Experience Scale of Shame, the Eysenck Personality Questionnaire-Revised Short Scale and a social anxiety measure to a Chinese sample (n = 211, 66 males and 145 females; average age, 20.12) and an American sample (n = 211, 66 males and 145 females, average age 20.22) of college students. The structural equation modeling (SEM) was performed separately for the Chinese and American samples. The SEM results revealed a shame-mediating model in the Chinese sample only. This model did not apply for the American sample. This study supports the hypothesis that shame has a more important effect on social anxiety in the Chinese culture compared to its effect on Americans. For example, In Japan, shame-prone and self-effacing behavior appears to be given

positive functional value and is actively promoted by society, whereas the American culture might tend to prohibit shame-prone behaviors and the show of one's vulnerability, while encouraging the visible demonstration of one's power and capacity (Okano, 1994).

Based on this review, we can conclude that social fears and social anxiety with relation to worry and anxiety are very much dependent on a particular culture. The same social behavior may be perceived as normal in one culture and "unreasonable and excessive" in another; cultural syndromes may lead to the expectation of certain types of embarrassment in particular situations; and the meaning of socially anxious disorder symptoms and their experiencing will be influenced by multiple factors, such as field dependence, gender role and gender role identification, local ideas of shame and what is shaming (on how cultural syndromes influence DSM disorders, Hinton and Lewis-Fernandez, 2010). People with social anxiety disorder fear violating the perceived social norms of the social reference group with which they identify themselves. The social reference group not only includes the cultural/racial/ethnic group, but also gender identification, social status and sexual orientation. In certain cultural groups, certain social situations and certain symptoms, actions, and "failures" may be the cause of particular shame; these shame syndromes associated with particular situations may take the form of a syndrome. An important research area is how persons in various cultures treat these social anxiety disorder symptoms, fear of body odor, fear of blushing, etc., in Asian and other cultures. This may give insight into the mechanisms generating the disorder (including the genetic contribution), and how culturally appropriate treatment can be conducted.

In conclusion, the purpose of this study is to clarify whether the concept of worry has two micro and macro worry objects and seven life domains. To identify the pattern and structure of worry, the EFA with two dimensions was used in this study. The results suggest that there is a clear distinction between macro and micro worry object factors in significant social concepts of health and well-being among the two samples (that is, the participants involved in our study). However, this study identified the cross-cultural differences of worry constructs of patterns and structures from the variance explained factor in the EFA with two dimensions. The variance explained factor in two-dimensional EFAs showed that there is a cross-cultural difference between the male and female samples in Japan and Hawaii, and gender differences between the male and female samples in Japan, because the Japanese male sample shows only the different and unique factor and structure pattern of worry structure in health and well-being.

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