Culture, Self, and Their Mutual Influences on Social Anxiety and Social Support

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General Abstract

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Sociocultural contexts provide frameworks with which people attempt to make sense of the world. Different sociocultural contexts foster different views of the self and how the self is related to others (Markus & Kitayama, 1991, 2010). Self and sociocultural context are deeply interrelated, and have a joint mutual influences on both psychological processes and overt social beahviours. This dissertation presents two manuscripts that showcase different methodological and analytical approaches to the unpacking of cultural variations in social anxiety and social support processes.

Manuscript 1 presents two self-report based studies that examine the mediating effects of self-construals and intolerance of uncertainty for cultural variations on social anxiety and the offensive-type of *Taijin Kyofusho* (OTKS). A two cultural group comparison (i.e., Euro-Canadians vs. Chinese migrants) in Study 1, and a three cultural group comparison (i.e., Euro-Canadians vs. Chinese vs. Japanese) in Study 2 were used to analyze the same mediation model. Results showed that there are significant differences among these different cultural groups on both social anxiety and OTKS, and that theses variations can be explained via different mediators. Both studies demonstrated that there are both psychological universality and cultural variations for social anxiety and OTKS in different cultural contexts.

Manuscript 2 examined how social support experiences are influenced by friendship qualities, gender and cultural effects. Social support experiences can be best understood within different levels of social complexity from Hinde (1987). This study combined the conceptual approach of Hinde with the analytical approach of the Actor-Partner Interdependence Model (Kenny, Kashy, & Cook, 2006) to scrutinize both

actor and partner effects during social support interactions among same-sex peers in two cultural contexts (i.e., Euro-Canadian vs. Chinese). Results indicated that friendship qualities predicted different support seeking (direct vs. indirect) and support provision (supportive vs. negative) styles. Cultural and gender variations also influenced support seeking and provision behaviours interpersonally and intrapersonally, after controlling for the nonindependence between the support seeker and the helper. These two manuscripts illustrated the endeavour to bridge theoretical, conceptual, and methodological frameworks in order to unpack the influences of culture and the self on psychological processes and social behaviours.

Acknowledgements

To the outside observer, a Ph.D. thesis may seem like a solitary work. However, to complete two projects of this magnitude, I am grateful to have a network of academic and social support. First, I would like to thank my thesis supervisor, Dr. Andrew Ryder, for his trust, guidance, and encouragement throughout my doctoral studies. I would also like to thank Dr. Lisa Serbin and Dr. William Bukowski for their continued assistance and encouragement date back all the way to my Masters years. The projects presented in this dissertation would not be possible without our collaborators from China, Dr. Yunshi Peng and from Japan, Dr. Jun Sasaki; and my RAs, just to name a few: Franca Lacroix, Alicia Fong, Alessia Di Cesare, and Dara Heather. Furthermore, I must thank the following researchers/professors who took their time answering my e-mails in details to help me to solve my research questions, even though we have never been acquainted personally: Dr. Andrew Hayes, Dr. David Kenny, Dr. Tom Loeys, and Dr. Teck Kiang Tan.

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Contributions of Authors

Manuscript 1:

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Manuscript 2:

Zhou, B., Di Cesare, A., Heather, D., & Ryder, A.G. (Under Reviewed) Cultural and Gender Variations in Social Support Seeking and Provision Behaviours: An Actor-Partner Interdependence Model Approach. *Submitted for publication.*

Contributions:

I proposed and led the study design, and data collection for both manuscripts, under the supervision of my thesis supervisor, Dr. Andrew Ryder. I developed the research questions; collected data in Canada with the assistance of my RAs; performed and interpreted the statistical analyses; and wrote and edited the current thesis. Dr. Ryder supervised the general progress, and provided commentary on the manuscripts. Dr. Yunshi Peng and Dr. June Sasaki collected a portion of the data for *Manuscript 1* in China and Japan, respectively. Dr. Peng's student Xia Wang also helped to plan and organize the data collection in China. My RA, Franca Lacroix assisted in organizing and collecting data in Canada. For *Manuscript 2*, I trained two RAs – Alessia Di Cesare and Dara Heather – to use the social support coding schemes. After reliability was established, Miss Heather and Miss Di Cesare coded all Euro-Canadian cases for social support seeking and provision, respectively. I coded all Chinese cases for both social support seeking and provision.

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General Introduction

Mencius is considered the most famous Confucius philosopher after Confucius himself and his mother was also wise. When Mencius was young, she moved the family three times in order to improve the upbringing of her son (Y. Wang, 1900). Like Vygotsky (1978), Mencius' mother understood the importance of sociocultural environment on child development. As the Japanese proverb has it: The environment makes our characters (Mon zen no kozo narawanu kyo wo yomu).

Socioculturally constructed environments provide frameworks for people to make sense of the world and then react to it accordingly (Kitayama & Park, 2007; Markus & Kitayama, 2010). As a result, social behaviours may be valued differently in different cultural contexts (Chen & Rubin, 2011). Take choice as an example: it is preferable in North American cultural contexts for choices to be available for guests at a party. However, choice would be considered a burden to guests in Japanese cultural contexts, because the host should have known better what is the best to serve at a party (e.g., Markus & Kitayama, 2003). These differential daily practices and social norms reveal not only overt behavioural differences cross culturally, they also reflect how people's psychology is shaped by the cultural contexts in which they are engaging (Markus & Kitayama, 2003).

For at least three decades, psychologists have been interested in the study of culture and self (Markus & Kitayama, 2010). Culture is not a fixed system containing a set of values and beliefs, nor is self a passive agent in the environments. Both culture and self are dynamic (Kashima, Koval, & Kashima, 2011; Kitayama & Park, 2007). Sociocultural contexts shape the structure of the self, but selves are also active agents in shaping their sociocultural contexts. This idea of the dynamic and mutual constitution between culture and the self converges with the Sociocultural Theory

of Vygotsky (Vygotsky, 1978). The fundamental tenet of the Vygotskian theory is that to understand human mental processes, researchers must place human beings in their sociocultural contexts (Daniels, Cole, & Wertsch, 2007). A child's learning and cognitive development are largely based on their social interactions with others, where cultural practices and meanings are being transmitted. Through the assistance and guidance from the more knowledgable others (e.g., parents, teachers, and sometimes peers), children internalize social rules and norms. Therefore, the sociocultural environments are considered to have critical influences on children's socialization processes (Vygotsky, 1978). The physical and social environments are not the same for every child, nor do they carry the same social meaning. What "the meaningful environment" is largely depends on the child who is living in it. Moreover, social environment also changes in response to the person's actions, capacities, age and so on (Daniels et al., 2007; Vygotsky, 1978). Consistent with Vygotsky, Markus and her colleagues posit that the construction of the self is through its interactions with the world, environment, context, institutions, practices, norms and values, and therefore, culturally dependent. People (i.e., selves), in turn, reinforce or change the sociocultural environments that shape their lives and guide their behaviours (Kitayama, Conway, Pietromonaco, Park, & Plaut, 2010; Plaut, Markus, Treadway, & Fu, 2012). This cycle of mutual constitution between culture and self emphasizes the inseparable tie between individuals and the sociocultural contexts they inhabit (Markus & Kitayama, 1991, 2010).

Cultural Views of the Self

Different cultural contexts foster different views of the self and how the self is in relation to others. Markus and Kitayama (1991, 2010) proposed that different cultural contexts carry independence and interdependence to varying degrees. These

variations are not mere differences in values; rather they reflect differences in the theories of being (Markus & Kitayama, 2003). Therefore, the cultural views of self are instrumental in organizing people's everyday lives and interactions with others. Since the publication of Markus and Kitaya's (1991) landmark paper on culture and the self, two cultural views of the self have been extensively studied: independent vs. interdependent self-construals (e.g., Kashima et al., 2011; Kitayama & Park, 2007; Kleinknecht, Dinnel, Kleinknecht, Hiruma, & Harada, 1997; Norasakkunkit, Kitayama, & Uchida, 2012; Singelis, 1994).

When a person's behaviours are organized and made meaningful in reference to one's own repertoire of thoughts, feelings and actions, the independent self-construal is said to predominate (Markus & Kitayama, 1991, 2010). The self is considered as a separate and distinctive entity when interacting with other people. Western cultural contexts, such as the ones in United States and Canada, have an emphasis on fostering the independent self-construal, whereas Eastern cultural contexts, such as the ones in China and Japan, tend to foster interdependent self-construal (Kitayama & Park, 2007). Interdependent self-construal defines the self as a relational entity, where behaviours are organized and determined by the other's feelings, behaviours and expectations (Markus & Kitayama, 1991, 2010). Fitting in with and taking the perspective of others are highly encouraged in interdependent cultural contexts. According to Markus and Kitayama, these different cultural views of the self organize our everyday behaviours and influence our cognition, emotion and motivation in vastly different ways. As mentioned earlier, letting guests choose what to eat or drink at a party does not reflect irresponsibility of the host in North American cultural contexts. Instead, it is a manifestation of autonomy and independence within independent cultural contexts. On the contrary, in interdependent cultural contexts, making the decision for the guests represents attentiveness to the needs of the guests without

them asking.

It is important to note that these two cultural views of the self are not mutually exclusive. There exists great variations in how people define the self within the independent and interdependent cultural contexts, and there could also be great similarities across different cultural contexts (Kitayama et al., 2010; Markus & Kitayama, 1991, 2003). The main interest of the current thesis is to examine how psychological processes and observable social behaviours are influenced by specific cultural contexts.

Psychological Universals and Cultural Variations

It is no news that "culture matters" (Ryder, Ban, & Chentsova-Dutton, 2011). Many social scientists share the enthusiasm of determining how far or how deep "culture matters" (e.g., Chen & Rubin, 2011; Kitayama et al., 2010; Ryder et al., 2008; Santo et al., 2013; Uskul, Lalonde, & Konanur, 2011). However, this task is never easy (Heine, Lehman, Peng, & Greenholtz, 2002; Markus & Kitayama, 2003). Norenzayan and Heine (2005) proposed conceptual and methodological frameworks to guide the investigation of psychological universals and cultural variations in psychological processes. Three cross cultural research strategies were outlined in their paper to test hypotheses regarding psychological universals; in other words, the generality of effects cross culturally.

Two Cultural Contexts Comparisons. This strategy's core function is to test whether the same effect exists in two distinctively different cultural contexts. These cultural contexts can vary on their demographic locations, languages used by the population or socioeconomic status, etc. The more divergent these two cultural contexts, the stronger the evidence is if the same psychological effects are observed (Norenzayan & Heine, 2005). However, this design's drawback is that it is extremely difficult to explain the effects if cultural variation is observed due to the extreme

differences on demographic variables, such as language or social norms and practices.

Three Cultural Contexts Comparisons. As a result, Three Cultural Contexts Comparisons approach was proposed by Norenzayan and Heine. This strategy is twofold: First, a psychological phenomena is examined between cultural contexts A and B; Secondly, a third cultural context, C, is entered into the comparisons with A and B. Therefore, this strategy not only preserves the maximal sociocultural differences across two cultural contexts, as in Two Cultural Contexts Comparisons, it also provides potential explanations to differential effects across the cultural contexts should variations be observed.

Cross Cultural Survey Study. This last strategy is a well practiced one among cross cultural and cultural psychologists (e.g., Hofstede, 1984, 2001). This strategy accesses psychological phenomenon in a large array of cultural groups with the same measures. "A compelling case for universality can be made when a phenomenon is clearly identifiable in a large and diverse array of cultures" (Norenzayan & Heine, 2005, p. 769). However, the challenges in this strategy should not be ignored. This approach is very effort-intensive and expensive. Due to the nature of this design, it may limit the complexities of the research to the minimal. Consequently, some culture-specific variations may be lost when examining a large array of cultural contexts. Furthermore, the three strategies proposed above are limited and constrained in their focuses on the analyses of individual differences and cultural group differences. Humans are social beings. Social interactions and relationships are important determinants of health and well-being (e.g., Eckenrode & Wethington, 1990). In the next section, different levels of social complexity proposed by Hinde (1987) will be summarized to facilitate the examination of culture, self and relationships.

Levels of Social Complexity

Human experiences within social relations (e.g., friendships) can and should be understood in light of different levels of social complexity. This section will borrow from Chen and Rubin (2011), Hinde (1987), and Rubin, Bukowski, and Parker (2006) to explore the significance of cultural contexts on all levels of social complexity.

Individuals. The level of individuals have long been an interest of psychologists (e.g., temperaments or personality traits). Individual differences in temperaments or personality traits may predispose a person to certain social stimuli and then guide a person's behaviours through preferences in social perceptions and interactions (Hinde, 1987; Rubin et al., 2006). Some of these differences have a biological base; however, they are also the product of interactions with others as well as the inevitable influences of sociocultural contexts. Individuals are actively shaping and being shaped by the sociocultural environments they are engaging in through the interactions with others (Markus & Kitayama, 2003, 2010). Cultural views of the self (i.e., interdependent vs. interdependent) are the examples of how sociocultural environments affect the construction of the self and how the differential understandings of the self could in turn affect various aspects of psychological processes (e.g., Okazaki, Liu, Longworth, & Minn, 2002; Park et al., 2013; Plaut et al., 2012; Rector, Kocovski, & Ryder, 2006; Ryder et al., 2008; Taylor et al., 2004; Tarumi, Ichimiya, Yamada, Umesue, & Kuroki, 2004; Uskul et al., 2011).

Interactions. Interactions are often described as dyadic social behahviours that are jointly undertaken by two individuals (Rubin et al., 2006). The actions of the two interactants are in fact related, such that one person's behaviour could be both a response and an initiation to the other person. For instance, during social support interactions, a negative behaviour (e.g., criticism) to a request may lead to a certain

style of support seeking strategy next time by the support seeker (Don, Mickleson, & Barbee, 2013; Barbee & Cunningham, 1995). Here, the negative behaviour is both a response to a request and an initiation/elicitation to the next request. What behaviours are considered to be appropriate in any given interactions are largely culturally dependent (e.g., Hinde, 1987; Markus & Kitayama, 2003). Furthermore, interactions are shaped not only by individuals' temperaments, personality, and the sociocultural contexts, but they are also configured by the next level of analysis: the specific relationships the interactants are in.

Relationships. Most interactions occur in certain relationships (Chen & Rubin, 2011; Hinde, 1987; Rubin et al., 2006). Relationships influence the nature of each interaction due to past experiences, and the current interactions influence the continuation or dissolution of a relationship (Cutrona, Shaffer, Wesner, & Gardner, 2007). Dyadic relationships, such as friendships, are particularly vulnerable because the loss of one member terminates the existence of the relationship (Rubin et al., 2006). Of course, the converse also poses an advantage: it only takes two members with reciprocal interests and affections for the relationship to be created; and sociocultural contexts provide blueprints for socially acceptable interactions and relationships to occur.

Groups. Dyadic relationships are also embedded within groups. A group in Rubin et al. (2006) refers to "a collection of interacting individuals who have some degree of reciprocal influence over one another" (p. 578). According to Rubin et al., one of the properties a group may possess is homogeneity or consistency of personal characteristics across members (e.g. gender). It is also the case that cultural norms and beliefs dictate the formation of groups in a given society. Whereas fraternity and sorority are popular social groups among college students in North America, joining the Communist Youth League is a common practice among adolescents and young

adults in mainland China.

Summary. It is worth emphasizing that each level of social complexity is influenced by all other levels, and most importantly, all levels are embedded in and affected by sociocultural contexts (Chen & Rubin, 2011; Hinde, 1987; Rubin et al., 2006). Each level is not a static entity, but it should be considered as a changing process that has bidirectional influences with all other levels and with sociocultural contexts (Chen & Rubin, 2011). Therefore, in order to adequately understand social interactions and relationships: 1) researchers must take sociocultural contexts into account; 2) researchers should analyze multiple levels of social complexity in order to understand cultural, group, dyadic and individual effects simultaneously and separately (Rubin et al., 2006).

The Current Research

The remaining sections present two manuscripts (three studies) to demonstrate ways in which one can combine theoretical models of culture and self (i.e., the cultural views of the self) with methodological frameworks (i.e., Cultural Comparisons and Levels of Social Complexity), and an advanced analytical approach (i.e., Actor-Partner Interdependence Model), to unpack the overarching influences of cultural contexts on psychological processes and observable social behaviours.

Manuscript 1. Social anxiety is one of the most studied psychological phenomenon cross culturally. On one hand, social anxiety is an ubiquitous experience in most societies (Good & Kleinman, 1985). On the other hand, researchers have consistently found cultural variations in both the experiences (e.g., Dinnel, Kleinknecht, & Tanaka-Matsumi, 2002; Kirmayer, 1991; Kleinknecht et al., 1997) and social consequences of social anxiety (see review in Chen, Wang, & DeSouza, 2006; Hofmann, Asnaani, & Hinton, 2010). Researchers from developmental to clinical psychology

continued their efforts in portraying the cultural landscapes of social anxiety (e.g., Chen, Cen, Li, & He, 2005; Xie, Leong, & Feng, 2008; Zhu et al., 2014). In *Manuscript 1*, we aimed to understand how cultural contexts shape psychological processes, such as social anxiety. The Two Cultural Contexts Comparison approach (Norenzayan & Heine, 2005) was used in Study 1 to examine the mediating effects of cognitive influences of intolerance of uncertainty and self-construals (i.e., independent vs. interdependent) on social anxiety across two cultural contexts – Chinese vs. Euro-Canadian. This traditional comparison between the "East" and "West" strived to examine the underlying processes that could explain the cultural variations in social anxiety using a parallel multiple mediation model.

In order to improve the generality of our results, the Three Cultural Contexts Comparison approach was used in Study 2 with the same multiple mediation model in Study 1 to further unpack the cultural shaping of social anxiety in Chinese, Japanese, and Euro-Canadian cultural contexts. Japan and China as the examples of interdependent cultural contexts are rarely being directly compared in cross cultural studies. However, these two cultural contexts differ on language, social etiquette, senior vs. junior ranking orders of the society, which affect many aspects of everyday lives (Hendry, 2003; Louie, 2008; Nakane, 1970). It is not surprising that these two cultural contexts carry the interdependent cultural ethos to varying degrees, which might then impact individual's mental processes. In short, investigating the cultural variations between China and Japan on social anxiety could deepen our understanding of *how* "culture matters" for social anxiety. *Manuscript 1* aimed to contribute to a better apprehension of social anxiety in light of the theoretical models of culture and self, as well as the recently identified underlying processes of intolerance of uncertainty.

Manuscript 2. While *Manuscript 1* focused mainly on the individual level of analysis, we extended our analyses of cultural context influences to the other three lev-

els of social complexity: interactions, relationships, and groups (Hinde, 1987; Rubin et al., 2006) in *Manuscript 2*. In this manuscript, we examined actual social support seeking and support provision behaviours among same-sex non-romantic friends from two cultural contexts: Chinese vs. Euro-Canadian. The Actor-Partner Interdependence Model (Kenny et al., 2006; Loeys & Molenberghs, 2013) made the analyses of multiple levels of social complexity possible. This analytic approach provides estimates of not only intrapersonal effects but also interpersonal effects simultaneously in one single model. In the case of *Manuscript 2*, the actor effects (intrapersonal effects) represent the support seeker's and support provider's own effects on themselves, whereas the partner effects (interpersonal effects) represent the effects of support seeker on support provider, and vice versa. It is noteworthy that because of the design of the Actor-Partner Interdependence Model, all effects presented in *Manuscript 2* are unique effects controlling for all other estimates in the model (Kenny et al., 2006).

The analysis for the level of interactions is based on the partial correlation between social support seeking and provision after controlling for all actor and partner effects. The analysis for the level of relationships is realized by examining the influences of friendship qualities (i.e., supportive vs. negative) on actual support seeking and provision behaviours. As for the analysis of groups, gender variations were considered in the analysis. Last but not least, cultural context variations were examined by entering in the Actor-Partner Interdependence Model to create an interaction term with friendship qualities to predict support seeking and provision behaviours.

Beyond the different levels of analysis proposed by Hinde (1987), *Manuscript 2* also attempted to investigate the temporal effects of support seeking and provision behaviours. Two experimental tasks were conducted in this study to examine the natural occurrence of social support interactions among same-sex peers. Cross Task Exami-

nations of such interactions had granted us more thorough and detailed perspectives of gender and cultural variations on social support transactions. Together, these two manuscripts demonstrate the benefits of using different methodological frameworks (i.e., Two/Three Cultural Context Comparisons vs. Levels of Social Complexity) for unpacking the influences of culture and self on psychological processes and social interactions.

Manuscript 1

Unpacking Cultural Variations in Social Anxiety and the Offensive-Type of Taijin Kyofusho Through the Indirect Effects of Intolerance of Uncertainty and Self-Construals

Abstract

This paper presents two studies that aim to unpack cultural variations in general social anxiety and the offensive-type of *Taijin Kyofusho* (OTKS) – a type of social anxiety characterized by the extreme fear of offending others. Cultural variations in the expression and manifestation of social anxiety are well established; however, the mechanisms underpinning this relation are unclear. The present studies use the Parallel Multiple Mediation Model to study how social anxiety and OTKS are jointly shaped by self-construal and intolerance of uncertainty. Study 1 compared Euro-Canadians and Chinese migrants in Canada. Results showed a mean group difference in OTKS, but not social anxiety, with the difference mediated by intolerance of uncertainty (IU). Study 2 tested this pattern of multiple mediations in Japanese, Chinese and Euro-Canadian cultural contexts. Results showed significant differences among these three cultural groups on both social anxiety and OTKS via multiple mediators (e.g., independent vs. interdependent self-construals and IU). Findings in both studies revealed that OTKS seems to be a psychopathology that is not specific to Japanese participants. The underlying mechanisms and processes of OTKS are also significantly different from social anxiety. Significant cultural variations in social anxiety and OTKS between Chinese vs. Japanese cultural contexts were observed in Study 2. These studies demonstrate the conceptual and empirical advantages of using more complex models to unpack the psychological mechanisms shaping cultural variations in social anxiety and OTKS.

Keywords: Social Anxiety, Offensive-type TKS, Multiple Mediation, Intolerance of Uncertainty

Introduction

Anxiety is an ubiquitous human experience and pervasive anxiety during social situations, to the point of significant impairment or distress, is understood within most societies worldwide as problematic (Good & Kleinman, 1985). Nonetheless, cultural variations exist both in the expression of symptoms and in the social context where these anxiety symptoms are elicited (Dinnel et al., 2002; Kleinknecht et al., 1997; Kirmayer, 1991). There is a growing literature detailing the ways in which culture shapes social anxiety (SA), with a particular emphasis on East Asian cultural contexts. SA disorder, according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), is marked by the persistent fear of social or performance situations in which embarrassment may occur. In contrast, SA in Japan and in China is understood differently. *Taijin Kyofusho* (TKS) is loosely translated as "anthropophobia" or "phobia of interpersonal relations" (Ono et al., 2001). Patients who suffer from this syndrome report experiencing a variety of symptoms, such as fears of eye-to-eye contact, blushing, displaying improper facial expressions in the presence of others, looking at others, or body odour being noticed (e.g., Takahashi, 1989).

Furthermore, elevated levels of self-reported SA are generally found in East Asian student samples relative to their Euro-American counterparts (e.g., Dinnel et al., 2002; Hong & Woody, 2007; Okazaki et al., 2002). Studies related on SA and TKS also demonstrated that people in East Asian cultural contexts are more likely to report fears of offending others in social situations whereas people in Euro-American or Euro-Canadian cultural contexts are more likely to report social fears that are self-oriented (e.g., Dinnel et al., 2002; Kleinknecht et al., 1997). Recently, the "Western" defined SA disorder included the fear of offending others as part of the diagnostic

criteria in DSM-5 (American Psychiatric Association, 2013). Most studies examining SA and TKS, however, are limited to documenting group differences, and potential explanations are relegated to the discussion section rather than being built into the methodology. As a result, we have little data about why these cultural variations are observed. A notable recent exception is a study of Japanese and American university students by Norasakkunkit et al. (2012), which examined the role of holistic cognition as the basic cognitive feature distinguishing self-oriented vs. other-oriented social anxiety.

The primary goal of the two studies presented in this paper is to unpack both cultural and individual variations in social anxiety and the offensive-type of *Taijin Kyofusho* for a better understanding of *how* "culture matters". By using both Chinese and Japanese samples, the second study in particular moves away from the common assumption that East Asian cultural groups are interchangeable. We will begin by considering cultural variations in self-construals, and then move to the potential role of intolerance of uncertainty as mechanisms operating in social anxiety and the offensive-type of *Taijin Kyofusho*.

Independent vs. Interdependent Self-Construals

The cultural variations in social anxiety due to a different understanding of oneself in relation to others have been well documented in previous research (e.g., Dinnel et al., 2002; Kirmayer, 1991). The important distinction between independent and interdependent self-construals has been shown to relate to social anxiety in different cultural settings (Dinnel et al., 2002; Hong & Woody, 2007; Okazaki et al., 2002).

Any particular person may react in a more independent or interdependent way depending on the specific situation. These two ways of understanding the self are not mutually exclusive, even though one might be more likely to be activated than

the other in a given context. The culturally defined views of the self (independent vs. interdependent) may produce different behaviours in response to social anxiety (Dinnel et al., 2002; Markus & Kitayama, 2010). In North American cultural contexts where the independent self-construal predominates, social anxiety problems tend to emerge from the fear of embarrassing oneself by acting inappropriately. In contrast, in Japanese or Chinese cultural contexts, social anxiety problems tend to emerge from the fear that inappropriate social interactions might offend others. In other words, for North American populations, the underlying fear of social anxiety is more "self" oriented, whereas the underlying fear that is most prevalent among East Asian populations tends to be more "other" oriented (Choy, Schneier, Heimberg, Oh, & Liebowitz, 2008; Kasahara, 1974; Kirmayer, 1991; Kleinknecht et al., 1997).

The Offensive-Type of *Taijin Kyofusho*

Many of the culturally distinctive aspects of TKS are combined in a subtype called the offensive-type of TKS (OTKS). Patients with OTKS fear that perceived physical defects or inappropriate behaviours might disturb, offend, or even harm others (Choy et al., 2008; Kasahara, 1987). For instance, a patient may be reluctant to look into another person's eyes because he/she fears that his/her eye gaze would make other people unbearably uncomfortable or might even *hurt* others. Although there is a general consensus that TKS resembles SA, patients with OTKS can be distinguished from patients with DSM-defined SA disorder by their persistent concerns that their symptoms might disturb others (Iwase et al., 2000; Kasahara, 1987; Nagata et al., 2006; Ono et al., 2001). In other words, OTKS sufferers tend to focus on the impact of their symptoms on other people while SA disorder patients in general tend to focus on the impact of the symptoms on themselves.

Studies have provided some support for the differing effects of self-construals on

SA and TKS (Dinnel et al., 2002; Kleinknecht et al., 1997; Norasakkunkit et al., 2012). Kleinknecht and colleagues conducted a series of studies examining the relation between self-construals and general TKS (not OTKS specifically) among American and Japanese university students. Results indicated that participants who construed themselves as less independent were more likely to report higher levels of TKS in both Japanese and American samples. The relation between interdependent self-construal and TKS was either small or nonsignificant in both samples. However, cultural context, namely Japanese vs. American, accounted for additional variability in TKS symptoms, with Japanese participants scoring higher. Clinical research, meanwhile, has shown that the TKS-specific fear of offending others or making others uncomfortable could be identified among North American patients with European heritage (e.g., Choy et al., 2008; Clarvit, Schneier, & Liebowitz, 1996; Rector et al., 2006). In addition, the occurrence of TKS symptoms is not strongly related to interdependent self-construal among Japanese students (Dinnel et al., 2002; Kleinknecht et al., 1997).

Self-construals (i.e., independent vs. interdependent self-construals) alone do not fully account for cultural variations in SA and TKS (e.g., Dinnel et al., 2002). Indeed, studies of cultural variation in independent vs. interdependent self-construals have often yielded mixed results (Kashima et al., 2011; Norasakkunkit et al., 2012; Matsumoto, 2002). The relation between culture and the self is highly complex – not only do they have a relation of mutual constitution (Markus & Kitayama, 2010), they also change over time (Kashima et al., 2011). Individual people within a cultural context differ from one another, and they can endorse, partially endorse, reject, or subvert cultural meanings and practices in innumerable ways (Ryder et al., 2011). We cannot simply claim that people living in East Asian cultural contexts are always more interdependent cross different situations than people living in "Western" cultural contexts. It is important to continue the investigation of culturally-shaped self-construals in or-

der to understand the mechanisms that contribute to the variations observed between East Asian vs. "Western" cultural contexts in SA and OTKS.

Intolerance of Uncertainty

Dugas, Schwartz, and Francis (2004) have defined Intolerance of Uncertainty (IU) as a person's excessive tendency not to tolerate a negative event may occur, however low the probability. People high in IU find the many ambiguous aspects of everyday life to be intolerable and stressful. IU was originally believed to contribute uniquely to worry and generalized anxiety disorder (e.g., Dugas et al., 2004). Recently, researchers found evidence that IU is also related to social anxiety (Boelen & Reijntjes, 2009; Carleton, Collimore, & Asmundson, 2010; Carleton et al., 2012; McEvoy & Mahoney, 2012), such that the effect of IU has unique contributions to social anxiety over and above fear of negative evaluation. Given that socially anxious persons fear that they are constantly under scrutiny by others (Hofmann et al., 2010), it is not surprising that social situations are intolerable for them because these situations are full of uncertainties – not least, the potential to be negatively evaluated (Boelen & Reijntjes, 2009).

IU at the country level has been measured by uncertainty avoidance, and research has linked higher levels of this cultural value with a higher prevalence of anxiety (Hofstede, 1984, 2001). Heinrichs et al. (2006) tried to link social norms with social anxiety, and their studies provided evidence that obvious and elaborated social rules for appropriate behaviours are indeed associated with higher SA. Both Heinrichs et al.'s and Hofstede's studies indicate that cultural rules and norms play nonnegligible roles in individuals' SA and well-being.

As mentioned previously, there are significant cultural variations in the expressions of SA, (e.g., OTKS vs. DSM-defined SA). These variations may be partially

explained by independent vs. interdependent self-construals (e.g., Dinnel et al., 2002; Kleinknecht et al., 1997; Okazaki, 1997; Norasakkunkit et al., 2012). However, cultural variations in IU as it relates to SA and OTKS at the individual level have yet to be examined. IU is considered as an important transdiagnostic maintenance factor for various anxiety disorders and depression (McEvoy & Mahoney, 2012). In an effort to test whether IU has the same effect on OTKS as on SA, this paper aims to unpack cultural variations in SA and OTKS by exploring multiple mediation effects (both *direct* and *indirect* effects) of self-construals and IU. We attempt to go beyond comparison of group differences and strive to identify the mechanisms underpinning these cultural variations in SA and OTKS.

First, this project will try to replicate previously identified cultural variations in SA and OTKS through the indirect effects of self-construals. Secondly, we will investigate the additional contribution made by the indirect effect of IU on social anxiety and OTKS. This paper presents two studies. Hong and Woody (2007) tested the mediating effects of self-construals in their paper comparing Korean with Euro-Canadian participants. Study 1 extends Hong and Woody's examination to the Chinese cultural context. Furthermore, the two self-construals were entered separately in two different models in Hong and Woody's study. Since independent and interdependent self-construals are not mutually exclusive (Markus & Kitayama, 2010), it is important to enter them in the multiple mediation model simultaneously in order to obtain the unique indirect effect of each mediator after controlling for the effects of the other mediators. Study 1 will examine these three mediators simultaneously using the Parallel Multiple Mediation Model (defined in the next section; Hayes, 2013) among Euro-Canadians and Chinese migrants who are currently residing in Montréal, Québec, Canada. Study 2 will examine the same variables through cross-group comparisons (Japanese in Japan vs. Chinese in mainland China vs. Euro-Canadians in Canada).

Study 1

OTKS is often studied among Japanese and Korean populations (e.g., Choy et al., 2008; Kasahara, 1987; Kleinknecht et al., 1997; J. Kim, Rapee, & Gaston, 2008), but it is rarely examined among Chinese populations. Not to presume all Asian cultural groups are interchangeable, a multiple mediation analysis [1] was used to examine cultural variations (Euro-Canadians vs. Chinese migrants) in social anxiety and OTKS via the operating mechanisms of independent self-construal, interdependent self-construal and IU (see conceptual models in Figure 1). In our case, we estimated the direct effects (denoted as c') of cultural variation in social anxiety and OTKS, and the indirect effects of self-construals and IU. Specifically, we predicted that the contrast between Euro-Canadians and Chinese migrants on both social anxiety and OTKS would be explained at least in part by the indirect effects of self-construals and IU.

Methods

Participants. Participants in Study 1 were drawn from two sources. Approximately 26% of the participants were originally recruited from a larger project requiring them to participate in pairs with a friend. One member of each pair was randomly excluded in this study in order to maintain independence of observations. The rest of the participants were independently recruited via the university's participant pool. Data for seven participants were dropped because they skipped at least one questionnaire. Our final analyses were based on a sample of 376 participants, almost all of whom (97%) were university students from the Montréal area.

[1] Multiple mediation models discussed in this paper were conducted using an open source SPSS macro "PROCESS" available at http://www.afhayes.com/. The three cultural group comparisons in Study 2 were made possible by the procedures outlined by Hayes and Preacher (in press) for analyzing multicategorical independent variables.

The Euro-Canadian participants (215 females, 52 males, mean age = 22.43, SD = 4.80) were all born in Canada and self-identified as (a) having European heritage and (b) being "White (Caucasian)". The Chinese heritage participants (60 females, 49 males, mean age = 21.46, SD = 4.70) were all born in China and left China after the age of 8. The Chinese sample in Study 1 consisted of either international students or immigrants who were residing in the Montréal area at the time of the study.

Measures. The *Self-Construal Scale* (SCS; Singelis, 1994) is a 30-item scale that measures independent self-construal and interdependent self-construal using a 7-point rating scale (ranging from 1 = Completely Disagree to 7 = Completely Agree). SCS consists of two subscales: independent self-construal and interdependent self-construal.

The *Intolerance of Uncertainty Scale* (IUS; Buhr & Dugas, 2002) is a 27-item scale that are related to uncertainty, one's reactions to ambiguous situations, and the cognitive and emotional implications of being uncertain. It has a 5-point *Likert* scale ranging from 1 (Not at all characteristic of me) to 5 (Extremely characteristic of me). An example of IUS is: "Uncertainty makes life intolerable."

The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998) is a 20-item widely used self-report that measures social anxiety. It is designed to assess social anxiety as typically defined by "Western" standards during interactions with others. It has a 5-point rating scale ranging from 0 (Not at all characteristic or true of me) to 4 (Extremely characteristic or true of me).

The *Taijin Kyofusho Questionnaire* (TKSQ; Choy et al., 2008) is a 30-item self-report that measures the severity of three sets of fears associated with ten physical and/or behavioral symptoms that are characteristic of TKS and social anxiety. Participants were asked to rate their fears associated with "embarrassing yourself", "making someone uncomfortable", and "offending someone" for each symptom using a 4-point

rating scale ranging from 1 (I would not be fearful at all) to 4 (I would be extremely fearful). Since our study focused on only the offensive-type of TKS (OTKS), we only used the 20 items that were related to the fear of "making someone uncomfortable" and "offending someone". According to the conceptualization of OTKS (e.g., Kasahara, 1974; Kirmayer, 1991), the fear of embarrassing others (e.g.,family or friends) should be the most prominent fear underlying OTKS, whereas embarrassing oneself should be the underlying fear for "Western" social anxiety. Therefore, the 10 items measuring embarrassment towards oneself were not included in the analyses.

The *Language Questionnaire* consists of three language related questions. Chinese participants were asked to rate their level of proficiency in speaking, understanding and writing in English using a 7-point rating scale with (1) = Very poor to (7) = Native-like. The mean level of English proficiency was 4.89, $SD = 1.06$. No ESL class student was recruited for this project. The recruitment criteria, verified by the language questionnaire, indicated that Chinese participants in this study have adequate English proficiency to understand the questionnaires.

All scales' internal consistencies reached satisfactory levels in the same range as estimates reported in the existing literature. Cronbach's alpha coefficients are presented in Table 1. Table 2 contains the correlations among all variables by cultural groups.

Procedures. All participants completed the online questionnaires hosted on a secured server. There was no time limit for completing the online questionnaire, allowing participants to complete it at their preferred pace. Participants were informed at the beginning of the survey that the study was completely voluntary, that they could discontinue the study at any time, and that they did not have to respond to questions that they did not want to answer. Upon completion of the survey, all participants had the choice between obtaining $20 in cash or psychology department

participant pool credits if they were eligible. A debriefing information page appeared at the end of the survey.

Results

Preliminary Analysis. About 0.3% of responses were missing from our data set. Little's Missing Completely At Random (MCAR) test was conducted for the Euro-Canadian participants and Chinese participants separately. Results showed that for both groups, responses were missing completely at random, $\chi^2(5057) = 5158.12$, $p = .16$ for Euro-Canadians and $\chi^2(2146) = 2036.11$, $p = .96$ for Chinese participants. Therefore, Maximum-Likelihood data imputations were employed for both cultural groups separately using the Expectation-Maximization algorithm (McKnight, McKnight, Sidani, & José, 2007). Mean scores for each scale and subscale were then calculated. Univariate outliers were winsorized and no multivariate outliers were observed using Mahalanobis Distances. The homogeneity of variance assumption was not met for some measures, with unequal variances between European-Canadian and Chinese participants for SIAS, $F(1, 374) = 10.25, p = .001$, and OTKSQ, $F(1, 374) = 116.53, p < .001$. We, therefore, used the heteroscedasticity-consistent standard error estimator within the "PROCESS" macro to correct for this issue (Hayes & Cai, 2007; Hayes, 2013).

Tests for homogeneity of regression slopes (Hayes & Preacher, in press) using ANCOVA showed an interaction between cultural groups and interdependent self-construal for SIAS, $F(1, 368) = 9.70, p = .002$. As a result, interdependent self-construal was not entered in further analyses involving SIAS because homogeneity of regression slopes could not be assumed. As one-way ANOVA showed that age differed between the two cultural groups, $F(1,374) = 14.07$, $p < .001$, it was entered as a covariate in the multiple mediation analyses.

Multiple Mediation Analysis. In this section, we examined cultural variations on social anxiety through the effects of self-construals (e.g., Hong & Woody, 2007) and IU, controlling for recruitment methods and age. Cultural group (i.e., European-Canadians vs. Chinese) was the independent variable and the outcome variables were social anxiety as measured by SIAS and the offensive type of TKS as measured by OTKSQ. The two mediators – independent self-construal and IU – were entered at the same time in the multiple mediation analysis for SIAS. Independent and interdependent self-construals, and IU, were entered as mediators for the analysis of OTKSQ. All indirect effects reported below were unique effects specific to the particular mediator, controlling for all other effects. All direct effects (noted as c') were also the unique effects between the independent variable and the outcome variable, after taking into account all other effects in the model. The regression coefficient between cultural groups and the mediator was denoted as a, whereas the regression coefficient between the mediator and the outcome variable was denoted as b. Since there were pairs of analyses (i.e., SIAS vs. OTKSQ) involving the same variables, we set significant p-value to .025 using Bonferroni correction in order to avoid the risk of inflating Type I error.

SIAS. The mediation analysis for SIAS indicated that the direct effect of cultural groups on SIAS was marginally significant after accounting for the indirect effects of independent self-construal and IU, $c' = .16$, $p = .03$, bias-corrected 97.5% CI [-.004, .32], with Chinese participants scoring higher on SIAS (see Table 1). The European-Canadian and Chinese groups differed on SIAS due to the indirect effects of independent self-construal (point estimate: .09, bias-corrected 97.5% CI [.05, .16]) and IU (point estimate: .29, bias-corrected 97.5% CI [.20, .41]). The mediation analysis suggested that the group differences between Euro-Canadians and Chinese migrants on SIAS were transmitted through the indirect effect of independent self-construal

and IU. Chinese migrants reported lower levels of independent self-construal, compared to the Euro-Canadians (a = -.40, p <.001) and these lower levels of independent self-construal were then related to higher levels of social anxiety measured by SIAS (b = -.24, $p < .001$). However, for IU, Chinese migrants reported higher scores on IU ($a = .73$, $p < .001$), which was associated with higher scores on SIAS ($b = .40$, $p < .001$).

OTKSQ. A different pattern of results emerged from the multiple mediation analysis for OTKSQ. The direct effect of cultural group on OTKSQ remained after accounting for the indirect effects of independent self-construal, interdependent self-construal and IU ($c' = .47$, $p < .001$, bias-corrected 97.5% CI [.31, .63]), with Chinese participants reporting higher OTKSQ scores (see Table 1). In contrast to the SIAS model, there was no indirect effect of independent self-construal (point estimate: .02, bias-corrected 97.5% CI [-.01, .06]) or interdependent self-construal (point estimate: .01, bias-corrected 97.5% CI [-.002, .04]) for OTKSQ, although the indirect effect of IU remained, point estimate: .17, bias-corrected 97.5% CI [.09, .26]. Group differences on OTKSQ via the influence of IU indicated that Chinese migrants reported higher levels of IU ($a = .73$, $p < .001$) and these higher levels of IU were then associated with higher levels of OTKS ($b = .23$, $p < .001$).

Discussion

Mean differences between European-Canadians and Chinese migrants were observed for social anxiety (marginally) and OTKS with the latter group reporting higher on both scales, after controlling for all the indirect effects. Group differences for SIAS could be explained through the indirect effects of independent self-construal and IU, whereas for OTKS, the group differences could be explained through the indirect effect of IU only. The effect of independent self-construal continued to predict

the "self-oriented" SA, but not the "other-oriented" OTKS. On the other hand, IU appeared to be consistently predictive of both SIAS and OTKS in Study 1.

The Chinese sample in this study included both immigrants and international students. We did not have information regarding the Chinese migrants' migration history nor did we control for the years they had been in Canada. In comparison, our Euro-Canadian participants were all born and raised in Canada. It is possible that some other variables, such as acculturation attitudes and networks of social interactions among Chinese migrants, could account for the results we have observed. In order to obtain cross-group comparisons that are not tainted by acculturation attitudes or other migration factors, we examined the same multiple mediation models in three cultural contexts (i.e., Canada, Japan and mainland China) in the next study.

Study 2

Chinese and Japanese cultural contexts tend to foster a more well developed interdependent self-construal, meaning that connectedness with others is particularly salient in Chinese and Japanese cultural contexts (Markus & Kitayama, 2010). Substantial variations exist between these contexts regarding the appropriateness and the importance of connecting with others. Hendry (2003) and Nakane (1970) described Japanese society as highly structured, particularly regarding interpersonal relationships. A highly elaborated system of proper social behaviour – "good manners" – are embedded within a complex hierarchical ranking system (Nakane, 1970; Sugimoto, 2009). There are many differences of rank based on relative age, year of entry or years of service. Ranking order is central to fixing social order and maintaining social cohesion in Japanese cultural contexts (Hendry, 2003). Since this highly structured social system is essential for harmonious interpersonal relations, uncertainty during social interactions may be particularly difficult to tolerate. IU may therefore be an

important antecedent of SA and OTKS in Japanese cultural contexts.

In contrast, despite the strong focus on interdependence, the hierarchical ranking system in China is much less stringent than in Japan partially due to political efforts to abolish "class oppression" since the mid-20th century (Louie, 2008) [2]. For instance, regular workers do not need to bow to greet the president of a company in China, but it would be considered extremely rude and disrespectful not to do so in Japan. The societal variations in the hierarchical ranking system are illustrated by a communication study about politeness in Japan and China (Lin, 2013). When participants were asked what came to mind when they heard the word "politeness", more than twice as many Japanese participants than Chinese participants associated "politeness" with senior and junior positions or hierarchical relationships.

Furthermore, many studies had examined OTKS among Japanese and Korean samples (e.g., J. Kim et al., 2008; Ono et al., 2001). OTKS is considered as a "other-oriented" fear that was first identified in Japan (Ono et al., 2001; Kasahara, 1974, 1987). Conceptually, lower independent self-construal and/or higher interdependent self-construal should be related to higher levels of OTKS. However, according to Hofstede (2001) and Hofstede, Hofstede, and Minkov (2010), Japan scored higher on the individualism dimension than China. Japanese cultural contexts tend to be more collectivistic in the Western standards and more individualistic in the Asian standards. Since the comparison between Japanese and Chinese cultural contexts in SA and OTKS is rarely made, it is unclear whether there are cultural variations in self-construals between these two cultural contexts. If there are such variations, it is also unclear whether and how these variations will contribute to the "self-oriented" SA

[2]Even though there is no direct comparison between Chinese and Japanese hierarchical ranking systems *per se*, the historical and political accounts of modern Chinese development have provided evidence that social hierarchy still exists in China but it is not as heavily embedded in daily social interactions as in Japan and it is not as visible as in Japanese social etiquette (Alon, 2003; Hendry, 2003; Louie, 2008; Sugimoto, 2009).

and the "other-oriented" OTKS. Therefore, three cultural group comparisons among Euro-Canadians, Japanese and Chinese participants in Study 2 will help to address these issues.

We hypothesized that there would be mean differences between Chinese and Japanese participants in the indirect effects of self-construals and IU. These mean differences would also be displayed in the comparisons between Euro-Canadians vs. Chinese, and between Euro-Canadians vs. Japanese. Due to the rich and elaborated system of proper social manners in Japanese society, we anticipated that the indirect effect of IU on social anxiety and OTKS would be stronger for Japanese participants, compared to Chinese and Euro-Canadian participants.

Methods

Participants. Participants were Japanese, Chinese and Euro-Canadian university students. Euro-Canadian participants (169 females, 29 males, mean age = 21.81, $SD = 4.30$) were all born in Canada and self-identified as (a) having European heritage and (b) being "White (Caucasian)". Chinese participants (52 females, 75 males, mean age = 19.71, $SD = .94$) were all born in China and were attending university in Changsha, Hunan Province, China at the time of the study. Japanese participants (68 females, 53 males, mean age = 21.03, $SD = 4.60$) were all born in Japan and were attending university in either the Kanto or the Chubu region, Japan.

Measures. The same scales as in Study 1 were used in this study. See Table 3 for correlations among variables. All scales were translated into Japanese and Chinese by three bilingual researchers who have background in psychology working on this project using a modified version of TRAPD team translation model (Harkness, 2003). The researchers formed two committees of translation: one for Japanese and one for Chinese. The three translators first divided the work of translating scales into

the other languages. Then, translators reviewed each other's translation work. Reviewers examined all scales item by item again in depth and identified "problematic" items. Then, all translators/reviewers discussed all items in group meetings, facilitated by telephone or VOIP services for international communications, as many times as needed until they reached an agreement on the translation. The authors in this paper served as adjudicators to help translators/reviewers to resolve any translation related problems during the process.

Finally, translators read though all scales independently again to check for typos and any other mistakes. If concerns of certain items arose during this stage, translators/reviewers would go back to review and discuss those items again until an agreement was reached. Adjudicators would then decide whether the modifications were ready to be finalized. A final version of the questionnaires were then discussed in conference meetings by translators/reviewers and adjudicators. All scales' internal consistencies reached satisfactory levels in the same range as estimated reported in the existing literature (see Table 4).

Procedures. Euro-Canadian participants completed the online questionnaires hosted on a secured server as in Study 1. Euro-Canadian participants received psychology department participant pool credits for their participation. A debriefing information page was presented at the end of the survey. For Japanese and Chinese participants, all questionnaires were completed in class using paper and pencil as part of their class participation. All participants were informed at the beginning of the survey that this study was completely voluntary, That they could discontinue the study at any time and that they did not have to respond to questions that they did not want to answer.

Results

Preliminary Analysis. About 0.5% of responses were missing from our data. Little's MCAR test was conducted for the Euro-Canadian, Japanese and Chinese participants separately. The results showed that for all three groups, the missing responses were missing completely at random, $\chi^2(4727) = 4856.58$, $p = .09$ for Canadians, $\chi^2(4329) = 4207.24$, $p = .91$ for Chinese, and $\chi^2(2293) = 2189.05$, $p = .94$ for Japanese participants. Therefore, Maximum-Likelihood data imputations were employed for the three cultural groups separately using the Expectation-Maximization algorithm (McKnight et al., 2007). Mean scores for each scale and subscale were then calculated.

Univariate outliers were winsorized and no multivariate outlier using Mahalanobis Distances was observed in this study. A one-way ANOVA showed that there were age differences among the three groups, $F(2, 446) = 11.96, p < .001$. Age was entered as a covariate in the following analysis. Homogeneity of regression slopes using ANCOVA showed that the interaction between cultural groups and independent self-construal was significant, $F(2,437) = 5.83$, $p = .003$ for SIAS. As a result, independent self-construal was not entered in the analysis predicting SIAS (Hayes & Preacher, in press).

The homogeneity of variance was not met for some measures, with unequal variances among the participants from the three cultural groups for SIAS, $F(2, 446) = 18.07, p < .001$, and in OTKSQ, $F(2, 446) = 9.63, p < .001$. We therefore used the heteroscedasticity-consistent standard error estimator to correct for this issue (Hayes & Cai, 2007; Hayes, 2013).

Multiple Mediation Analysis. In order to avoid inflating Type I error with multiple analyses using the same outcome variables, we set the significant p value to

.01. Multiple mediation models using cultural groups as the independent variable, and SIAS and OTKSQ as the dependent variables were analyzed in Study 2, see Figure 1 for the conceptual model.

Euro-Canadians vs. Chinese. The direct effect of cultural group mean differences on SIAS was significant (c' = -.30, $p < .001$, bias-corrected 99% CI [-.48, -.12]), with Euro-Canadian participants rating higher (see Table 4). Chinese participants rated higher on interdependent self-construal than Euro-Canadian participants, $a = .31$, $p < .001$. There was no mean difference between these two groups for IU, $a = .06$, $p = .36$. There was no indirect effect found for the prediction of SIAS.

For the analysis of OTKSQ, there was no direct effect of cultural group mean differences (c' = -.05, $p = .41$, bias-corrected 99% CI [-.21, .11]), nor was there an indirect effect for IU, point estimate: .02, bias-corrected 99% CI [-.03, .08]. There were, however, indirect effects of interdependent self-construal on OTKSQ (point estimate: .07, bias-corrected 99% CI [.02, .14]) and independent self-construal (point estimate: .04, bias-corrected 99% CI [.002, .09]) in predicting OTKSQ.

Chinese participants rated higher on interdependent self-construal than Euro-Canadians, $a = .31$, $p < .001$. Higher interdependent self-construal was related to higher OTKSQ, $b = .23$, $p < .001$. The mean difference of OTKSQ between Euro-Canadian and Chinese participants, with Chinese participants rating higher (see Table 4), was accounted for partially by the indirect effect of interdependent self-construal. Euro-Canadians rated marginally higher on independent self-construal than Chinese participants, a = -.21, $p = .01$. Higher independent self-construal was negatively related to OTKSQ, b = -.18, $p < .001$. The mean difference of OTKSQ between these two groups can also be explained by the indirect effect of independent self-construal.

Euro-Canadians vs. Japanese. There was no direct effect of cultural groups on SIAS, $c' = .03$, $p = .77$, bias-corrected 99% CI [-.19, .23]. There was no group

difference on interdependent self-construal, a = -.12, p = .09. However, Japanese participants reported higher levels of IU compared to the Euro-Canadian participants, a = .63, $p < .001$. As predicted, there was an indirect effect of cultural groups on SIAS via IU, point estimate: .35, bias-corrected 99% CI from .22 to .50. Japanese participants reported higher scores on IU, and then IU was related to higher levels of SIAS, b = .55, $p < .001$. There was no indirect effect of interdependent self-construal for predicting SIAS.

Turning to the prediction of OTKSQ, there was no direct effect of cultural groups on OTKSQ, c' = .05, p = .52, bias-corrected 99% CI [-.15, .25], but there were indirect effects of independent self-construal (point estimate: .05, bias-corrected 99% CI [.02, .11]) and IU, point estimate: .15, bias-corrected 99% CI [.08, .25]. Euro-Canadians reported higher levels of independent self-construal than did Japanese participants (a = -.29, $p < .001$), and higher independent self-construal was related to lower OTKSQ, b = -.18, $p < .001$. The group mean differences between Euro-Canadians and Japanese were mediated by the effect of independent self-construal. Japanese participants also reported higher levels of IU (a = .63, $p < .001$), which in turn predicted higher levels of OTKSQ, b = .24, $p < .001$. In short, IU was a significant mediator operating for the mean differences between Euro-Canadians and Japanese on both social anxiety and OTKS. Specifically, Japanese participants endorsed higher levels of IU and then IU was positively related to both SIAS and OTKSQ.

Chinese vs. Japanese. There was a mean difference on SIAS between Chinese and Japanese participants (c' = .32, $p < .001$, bias-corrected 99% CI [.11, .54]), with Japanese participants scored higher (see Table 4). There were also group mean differences on interdependent self-construal (a = -.43, $p < .001$) with Japanese participants scoring lower than Chinese participants did. The only indirect effect for SIAS involved IU, point estimate: .31, bias-corrected 99% CI [.19, .45]. Japanese partici-

pants reported higher levels of IU than Chinese participants ($a = .56$, $p < .001$), and IU was positively related to SIAS, $b = .55$, $p < .001$.

For the analysis of OTKSQ, there was no direct effect of cultural groups, $c' = .10$, $p = .22$, bias-corrected 99% CI [-.11, .31]. There were indirect effects for both interdependent self-construal (point estimate: -.10, bias-corrected 99% CI [-.18, -.04]) and IU, point estimate: .13, bias-corrected 99% CI [.07, .22]. Japanese participants reported lower levels of interdependent self-construal and higher levels of IU (see Table 4). Interdependent self-construal and IU were then both positively related to OTKSQ, $b = .23$ and $b = .24$ respectively, $ps < .001$.

Discussion

It has been well documented that there are cultural variations in psychopathology (Dinnel et al., 2002; Heinrichs et al., 2006; Kirmayer, 1991; Takahashi, 1989). However, it is still an ongoing task to examine the underlying processes of these variations (Draguns & Tanaka-Matsumi, 2003). This paper is the first to our knowledge to consider multiple cognitive pathways (i.e., self-construals and IU) to unpack the cultural influences on social anxiety and OTKS. This approach represents one way to respond to the preference in cultural-clinical psychology for explanations of the processes underlying how culture shapes mental health (Ryder et al., 2011).

Study 1 compared Euro-Canadians and Chinese migrants using the multiple mediation model. Independent self-construal was a significant mediator only for SIAS, not for OTKS. Consistent with previous research (e.g., Dinnel et al., 2002; Kleinknecht et al., 1997; Xie et al., 2008), Chinese migrants reported lower independent self-construal compared to Euro-Canadians, and through this effect of independent self-construal, Chinese migrants reported higher levels of SIAS. This is consistent with previous findings that people who were more concerned about autonomy from others were less

likely to be socially anxious (e.g., Dinnel et al., 2002; Okazaki, 1997).

However, for OTKS, the two self-construals did not mediate the group differences we observed in Study 1. The influences of self-construals diminished when IU was in the model predicting OTKS. The results of Study 1 suggest that both "self-oriented" and the "other-oriented" fears are susceptible to IU, and the effect of IU is more salient among Chinese migrants than Euro-Canadians. In the multicultural Canadian social context, Chinese migrants may face many challenges during daily social interactions with people from different cultural backgrounds, and social norms and rules might be very different from what they have been used to in China. Levels of uncertainties during social interactions with others might be higher for Chinese migrants, compared to their Euro-Canadian counterparts. As a result, Chinese migrants might find social interactions with others very anxiety provoking and be fearful of offending others due to the novel and ambiguous situations they often face.

In order to ensure the cultural variations we observed in Study 1 are generalizable, we conducted a parallel study in three cultural contexts to further examine population specific variables that are related to and implicated in social anxiety and OTKS (Norenzayan & Heine, 2005). Different indirect effects (mediations) in the three cultural group comparisons were found in Study 2. Unlike in Study 1, the indirect effect of IU was not statistically significant for SIAS or OTKS in the comparison between Euro-Canadians and Chinese. This finding may be due to the significant mean differences in SIAS, $t(284) = -8.87$, $p < .001$, and OTKS, $t(245) = -17.69$, $p < .001$, between Euro-Canadians in Study 1 and Study 2 with participants from Study 2 rated higher on both scales. There were no significant differences in SIAS and OTKS for Chinese participants between the two studies. Therefore, the lack of a statistically significant indirect effect of IU in Study 2 may indeed be due to the higher mean levels of SIAS and OTKS for Euro-Canadian participants.

Another possible explanation is rooted in the local socio-cultural contexts. A post hoc analysis indicated that Chinese migrants in Canada (Study 1) and Chinese participants in China (Study 2) had similar levels of IU, $t(196) = -.30$, $p = .76$. Our results suggest that the effect of IU found in Study 1 is not because Chinese migrants are less tolerant of uncertainty than the Chinese in Study 2. Instead, the result indicates that not only ethnocultural backgrounds but also the specific local socio-cultural contexts where participants live (e.g., Chinese migrants in a multicultural Canadian context) influence levels of social anxiety and OTKS. Specific local socio-cultural contexts have their own social norms and daily practices reflecting different ecologies and histories; these local contexts also have their own unique cultural meanings of how to be and how to be well (Plaut et al., 2012). What is deemed to be socially acceptable and desired varies from one place to another. Socialization processes in a given cultural context can certainly reflect people's psychological processes. For instance, independent self-construal is often found to be related to less social anxiety (e.g., Dinnel et al., 2002; Hong & Woody, 2007; Okazaki et al., 2002). However, the local socio-cultural context where these psychological processes become salient or even pathological is also important because both cultural contexts and the self are constantly undergoing negotiation and reformation within these local socio-cultural contexts (Kashima et al., 2011). As a result, it is crucial to consider cultural variations in social anxiety, OTKS, and psychopathology in general as a process in a given context, not a static mean difference between groups across all situations and locations.

In other cultural contrasts, IU appears to be a much more important factor contributing to the variations between Euro-Canadian and Japanese contexts than between Euro-Canadian and Chinese contexts on both SA and OTKS. There were several significant mediation results involving comparisons of the Chinese and Japanese groups, comparisons that are rarely made in the literature. Interdependent self-

construal was not a significant mediator for SIAS in this comparison, but it was a significant mediator for OTKS. This was consistent with our conceptualization of OTKS as a form of anxiety that is more "other-oriented" than the traditional "Western" defined social anxiety, but this was not the case in the Euro-Canadian vs. Japanese comparison.

In addition, Japanese participants reported lower levels of interdependent self-construal than did Chinese participants, and the lower levels of interdependent self-construal positively related to higher levels of OTKS. Since the comparison between Japanese and Chinese is rarely made, it is unclear why Japanese participants would rate lower in interdependent self-construal compared with the Chinese participants. Our results provide support for Hofstede (2001) and Hofstede et al. (2010) that at the country level, Japanese tend to be more individualistic in Asian standards. Moreover, cultural differences in self-construals have often yielded mixed results, especially for interdependent self-construal (Kashima et al., 2011; Kleinknecht et al., 1997; Matsumoto, 2002; Xie et al., 2008). This may be due to the self-report measures we used, which only reflects the attitudinal aspects of self-construals (Norasakkunkit et al., 2012) and fails to fully capture the dynamic mutual constitution between culture and the self (Kashima et al., 2011; Markus & Kitayama, 2010).

Japanese participants were also more likely to report higher levels of IU, in comparison to Chinese participants. IU in turn was associated with higher levels of both social anxiety and OTKS. Our results indirectly support Heinrichs and colleagues' (2006) hypothesis that social norms are related to social anxiety, and the anxiety-provoking sanctions of inappropriate social behaviours may be greater for cultural groups with stringent social norms than cultural groups favoring more relaxed social norms. Moment-to-moment social interactions with others are inherently complex and potentially unpredictable; consequently, heightened levels of IU becomes a par-

ticularly salient factor in eliciting social anxiety and OTKS.

The centrality of IU is particularly salient in Japanese cultural contexts, where appropriate behaviours are embedded in elaborate rules of daily social interactions – ranging from the degrees of bowing to the manner of pouring alcoholic beverages (e.g., Hendry, 2003; Nakane, 1970; Sugimoto, 2009). There is much opportunity, therefore, to be negatively evaluated. Even though the degrees to which Japan and China differ in terms of social norms was not directly tested, the results of Study 2 provide evidence that there are different pathways associated with SA and OTKS in the Japanese vs. Chinese cultural context comparisons. The influence of IU on eliciting SA and OTKS was stronger in the Japanese cultural context, as predicted, than in the Euro-Canadian and Chinese cultural contexts. Future studies should go beyond the comparison between the "West" and the "East", and focus more on specific cultural context comparisons, such as Japanese vs. Chinese or Japanese vs. Koreans to replicate the results obtained here.

Several limitations should be kept in mind while interpreting the outcomes of the two studies presented above. Participants in these two studies consisted mostly of university students. Future studies should extend this approach to community and clinical samples for replication. The two studies were all based on self-report measures. Experimental manipulation of uncertainty or intolerance of uncertainty as well as observational measures are necessary to investigate the causal influence of IU on OTKS and social anxiety in multiple cross cultural contexts. Furthermore, even though we have used the exact same items in each scale in Study 2 in order to ensure comparability between Study 1 and 2, Differential Item Functioning (DIF) analysis showed that certain items in IUS, SCS and OTKSQ[3] in Study 2 displayed

[3]Items displayed DIF in IUS – 2, 5, 9,21 (Buhr & Dugas, 2002), Independent self-construal – 9, 24, 25, Interdependent self-construal – 4, 16, 17, 19 (Singelis, 1994), TKSQ – 30 (Choy et al., 2008).

uniform DIF. This may be due to different languages used in Study 2 and it also may be due to some items being understood differently in different cultural contexts and therefore be responded differently. Future investigations perhaps should focus on refining certain items in these three scales. Furthermore, as mentioned earlier, the two samples of Euro-Canadian participants in Study 1 and Study 2 had significantly different means for SIAS and OTKS. The interpretation of Euro-Canadian vs. Chinese group comparison should therefore be made cautiously. Future studies should be conducted using similar models and more refined items in each scale in order to replicate our results.

Finally, different significant mediators for predicting SIAS and OTKS in the four cultural contexts (Euro-Canadians, Chinese migrants in Canada, Chinese and Japanese) have shed light on the importance of comparing multiple pathways (*i.e.*, IU and self-construals) simultaneously leading to social anxiety and OTKS. This study also helps to give credence to IU in further unpacking its similar influences on SA and OTKS. On the one hand, the two studies suggest psychological universality of the effect of IU on SA and OTKS, such that IU was positively related to both SA and OTKS across all cultural groups (see Tables 2 and 3). On the other hand, the extent to which IU is contributing to the cultural variations in SA and OTKS depends on the specific group comparisons. This pattern also holds true for the effects of independent vs. interdependent self-construals. In sum, the evidence obtained in this paper points to both psychological universality and cultural variability for aspects of SA and OTKS.

The two studies presented in *Manuscript 1* reveal that social anxiety and OTKS are jointly shaped by self-construal and intolerance of uncertainty. *Manuscript 1* demonstrates the conceptual and empirical advantages of using the parallel multiple mediation model to unpack the psychological mechanisms underpinning the cultural variations in social anxiety and OTKS. However, these two studies fixed their examinations of cultural variations only on the individual level of analysis (Hinde, 1987). As explained in the general introduction, the influences of culture not only exist on the individual level of social complexity, but also on all the other levels of social complexity: interactions, relationships, and groups. Chen and Rubin (2011) proposed that social interactions within dyads, groups and larger social settings, especially in light of *the peer context*, could unfold cultural influences on child development. *Manuscript 2* extends Chen and colleagues' perspective on culture and child development to social support interactions among same-sex friends. Relationship quality, gender role expectations as well as cultural variations will be accounted for in this study of observable social support interactions among peers.

Manuscript 2

Cultural and Gender Variations in Social Support Seeking and Provision Behaviours: An Actor-Partner Interdependence Model Approach

Abstract

This paper aims to investigate social support seeking and provision behaviors simultaneously using the Actor-Partner Interdependence Model (APIM) approach. Social support is a dynamic interactive process, and it often occurs in close relationships. The APIM approach provided estimates for both interpersonal and intrapersonal effects within the relationship. This study relied on the analysis of different levels of social complexity (Hinde, 1987) to examine how support was sought and provided within same-sex friendships from two cultural contexts: Chinese vs. Euro-Canadian. Friendship qualities were used to predict different support seeking (direct vs. indirect) and support provision (supportive vs. negative) styles during two experimental tasks. Cultural and gender variations were also examined in this study. Results showed that self-reported friendship qualities influence support seeking and provision behaviors interpersonally and intrapersonally. Moreover, results regarding cultural variations indicated that Chinese participants were more tolerant of the use of indirect support seeking than their Euro-Canadian counterparts. Male participants benefited more from supportive friendships than female participants in terms of support seeking. These results demonstrate the conceptual and empirical advantages of using APIM to unpack the cultural group and gender variations in social support seeking and provision simultaneously.

Keywords: Social Support Seeking; Social Support Provision; Friendship Quality; Actor-Partner Interdependence Model; Cultural Contexts; Gender

Introduction

When faced with loss, disappointment and challenges, a helping hand from friends and family is often welcomed and expected. Social support has been examined in a variety of disciplines, such as anthropology, epidemiology, community health, and psychology (e.g., Cable, Bartley, Chandola, & Sacker, 2013; Goldsmith, 2004; Jacobson, 1987; H. S. Kim, Sherman, & Taylor, 2008). Its well-known positive effects include reductions in social anxiety and eating disorders symptoms (Wonderlich-Tierney & Vander Wal, 2010), depressed mood (Bolger, Zuckerman, & Kessler, 2000; Schuster, Kessler, & Aseltine, 1990), and severity of chronic stressful physical conditions (Martin, Davis, Baron, Suls, & Blanchard, 1994; Masters, Stillman, & Spielmans, 2007). Current research on social support has been moving away from reliance on self-report, and started to employ different study designs, such as daily diary (e.g., Bolger et al., 2000) and experimental manipulation of support from confederates (e.g., Bolger & Amarel, 2007; Mojaverian & Kim, 2013). However, most of these studies did not address support provision and support seeking simultaneously and only examined one target person (e.g., the help seeker) instead of analyzing support transactions within the dyad. This hinders our understanding of social support processes.

Social support in personal relationships is a dynamic process (Leatham & Duck, 1990). To understand this process requires exploring the nature of relationships and of support by analyzing an individual person's experiences within the dyad. Similarly, Barbee (1990) suggested that researchers should examine social support in an interactive model that involves both social support seeking and provision. This has rarely been done, partly because social support often occurs in intimate relationships (Cutrona, Russell, & Gardner, 2005; Leatham & Duck, 1990): modeling the nonindependence between the two members of a dyadic relationship has been challenging

(Wickham & Knee, 2012). Furthermore, whereas social support *interactions* occur in specific relationships, *relationships* are embedded in *groups* (e.g., gender groups or classes) which dictate the features and patterns of the relationships and interactions that would likely to arise in a given *sociocultural context* (Hinde, 1987; Rubin et al., 2006). Researchers have rarely demonstrated the interwoven relations in the different levels of analysis while examining social support. Conclusions drawn from one single level of analysis, such as the effect of marital satisfaction in support provision behaviors, are limited in explaining the dynamic processes of social support.

With the recent development in multilevel modeling and the Actor-Partner Interdependence Model, however, the conceptual and statistical challenges of examining multiple levels of analysis in social support have become manageable (Kenny et al., 2006; Kenny & Kashy, 2011; Loeys & Molenberghs, 2013; Wickham & Knee, 2012). In the present study, we strive to address both conceptual (e.g., the dynamic nature of social support transactions) and analytical concerns (e.g., interdependency within relationships and groups) pertaining to social support by investigating three levels of analysis – interactions, relationships, and groups – in two experimental tasks. Furthermore, culture, as the macrosystem impacting all levels of analysis (Hinde, 1987; Rubin et al., 2006), will also be examined in this study. To these ends, the overarching goal of this study is to unpack naturally occurring support seeking and provision behaviors (i.e., interaction) within same-sex friendship dyads (i.e., relationship and group) in Chinese and Euro-Canadian cultural contexts.

Social Support Seeking and Provision. Social support can be defined as, "the social resources that persons perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships" (Wills, 1991, p. 4). Social support provided in dyads and small groups is often examined in three forms: *informational, instrumen-*

tal, and *emotional* (see a review in Taylor, 2007). Two support-seeking strategies have been identified: *direct* vs. *indirect support seeking* (Barbee et al., 1993; Barbee & Cunningham, 1995). *Direct support seeking* includes overt and explicit behaviors containing necessary information to allow successful support transactions to occur, such as asking friends to help you move to a new house over the weekend. *Indirect support seeking* includes behaviors that are more subtle and passive; it may vaguely signal help is needed without specifying what kind of help is needed. An example of indirect support seeking would be complaining about a difficult situation without asking for help directly.

Indirect support seeking is theoretically different from direct support seeking because the help-seeker provides nonspecific information regarding the problem (Barbee & Cunningham, 1995). This may pose challenges for support provider to identify the needs of the support seeker, and then the support provider may further face difficulties in meeting the specific needs of the support seeker with inadequate information. Consequently, indirect support seeking may lead to a negative response from the support provider (Barbee, 1990; Barbee & Cunningham, 1995). Don et al. (2013) examined 204 new parents at three time points: during the third trimester of pregnancy, 1-month postpartum, and 4-month postpartum. During phone interviews, husbands and wives separately answered questions regarding their indirect support seeking behaviors and their *perceived* negative support responses from the partner. The researchers found evidence that the use of indirect support seeking during pregnancy was related to elevated levels of *perceived* negative support responses at 1-month postpartum, which predicted indirect support seeking at 4-month postpartum, after controlling for relationship satisfaction at all three time points.

This study supported Barbee and Cunningham's (1995) proposition that indirect support seeking may not be the best support seeking strategy. In fact, it may

push social interactions into a vicious cycle, where indirect support seekers would be reluctant to use direct support seeking because they are afraid of receiving more negative responses from their partners. As a result, support seekers may continue to use indirect support seeking in order to minimize the embarrassment of needing help or reducing self-esteem (Barbee et al., 1993). This may also lead more negative responses from the support provider due to the struggles support provider experiences with inadequate information provided by the support seeker (Don et al., 2013). Support seeking and support provision behaviors may take on different forms in different occasions and relationships. The activation or lack of activation of certain support seeking or provision behaviors can be influenced by various factors (Taylor, 2007), such as gender, cultural contexts and specific relationship, which will be briefly reviewed in the following sections.

Gender Effects. Don et al.'s (2013) longitudinal study illustrated the reciprocal relation between indirect support seeking and perceived negative responses from the partner, but has neglected to address gender variations in their study. Previous research suggested that women are more likely to seek help than men (Day & Livingstone, 2003; Shumaker & Hill, 1991) and husbands tend to report more supportive interactions with their wives than wives did with their husbands (Schuster et al., 1990). Furthermore, women also reported more negative interactions with their spouse, relatives, and friends compared to men (Schuster et al., 1990).

Barbee et al. (1993) suggested gender stereotypes could contribute to differential support seeking behaviors between men and women. They theorized that gender role expectations played an important role in how support is sought. The female gender role, associated with nurturance and emotional expressiveness, might place women in an advantageous situation in terms of openly soliciting help or receiving unsolicited help because women are "expected" to need help during times of stress. On the other

hand, men who are expected to be competent and independent may be reluctant to seek help indirectly or directly because requesting for help or hinting help is needed might make them look weak and dependent (Barbee et al., 1993; Bolger & Amarel, 2007). Consequently, the potential loss of face and threat to self-esteem may hinder men from seeking support.

Other studies however, suggest that men and women are equally willing to seek support and provide support (e.g., Barbee, 1990; Cutrona et al., 2007). The gender variations in social support are actually due to the responsiveness of the support provider, with women being more responsive to their husbands during high distress days than are men to their wives (e.g., Neff & Karney, 2005). These gender effects were obtained in heterosexual romantic relationships, which may be specific to heterosexual romantic couples. More thorough examinations of gender effects in other relationships, such as same-sex friendships, will prove fruitful in understanding the complex and dynamic processes of social support.

Cultural Variations. Since gender role expectations are broadly similar in both "Western" and "Asian" cultural contexts (Chueng, 1996; Granrose, 2006), gender variations in social support seeking and provision are expected to be similar between the "West" and the "East". Nevertheless, research showed that there are cultural variations in social support experiences, which are influenced by the different cultural views of the self (H. S. Kim & Markus, 1999; H. S. Kim et al., 2008; Taylor et al., 2004; S. Wang, Shih, Hu, Louie, & Lau, 2010). For instance, research on culture and social support showed that Asians/Asian Americans are less likely to mobilize social support when coping with stressful negative events (Taylor et al., 2004) and positive events (S. Wang et al., 2010), compared with European Americans. H. S. Kim et al. (2008) argue that Asians/Asian Americans are more concerned about potentially negative consequences of explicit social support seeking because imposing one's

personal problems on others may undermine group harmony. Cultural variations in self-construal might have substantial implications for social support seeking and provision in different cultural contexts. In individualistic cultural contexts, the self is understood as derived from its inner attributes, which are assumed to reflect the essence of the person. Independent selves are distinctive and autonomous entities (Markus & Kitayama, 2010). People shaped by individualistic cultural contexts are then expected to take actions to express their opinions and realize their goals. Social relationships are assumed to be more autonomous with relatively few obligations. Hence, it is appropriate to actively seek support from others, such as to recruit family's and friends' attention and time, to cope with stress because social support is seen as a resource (H. S. Kim & Markus, 1999; Taylor, 2011).

In contrast, among collectivistic cultural contexts, such as those that predominate in Japan and China, the self can be viewed as a relational entity that is connected to and sustained by a number of significant relationships (e.g., family relations, occupational relations, and/or friendships). Here, the self is an extension of one's familial or social groups. The person, as a part of a group, is defined with reference to the larger whole (Markus & Kitayama, 2010). Members of the collectivistic cultural contexts are expected to conform to social norms and seek consensus within the social group. In this case, personal goals and needs become secondary to maintaining social solidarity and harmony (H. S. Kim & Markus, 1999). Consequently, it is inappropriate to burden others with one's own troubles because doing so might disrupt social harmony (H. S. Kim et al., 2008). It has also been argued that support may be perceived as troubling because the need for support is a sign of incompetence and lack of self-efficacy in individualistic cultural contexts (Bolger & Amarel, 2007), but it also may be perceived as problematic in collectivistic cultural contexts because support seekers worry about placing burdens on support providers (Park et al., 2013). In

other words, cultural variations in social support seeking are based on self-oriented concerns for maintaining self-efficacy in individualistic cultural contexts, and other-oriented concerns for avoiding imposing troubles on others in collectivistic cultural contexts.

H. S. Kim et al. (2008) proposed that Asians or Asian Americans may prefer social support seeking in a more subtle manner, such that people would not need to disclose their problems or stressful events directly to others. Kim and colleagues believe that such implicit emotional support is enough for the person in need to feel comforted. It is unclear whether cultural variations also exist for other forms of support seeking, such as nonverbal behaviors (e.g., silence during interactions) or *indirect support seeking* behaviors (e.g., leaving hints) proposed by Barbee and Cunningham (1995). Only one study has examined the relationship between self-construal and support seeking preferences and has showed that the more participants endorsed interdependent self-construal, the more likely they were to use "hint" as their initial and second request strategy for eliciting help. Moreover, "hint" was considered to be less effective by participants who endorsed higher levels of independent self-construal. People from East Asian cultural contexts where interdependent self-construal is fostered (Markus & Kitayama, 2010), in contrast, may not consider directly talking about one's problem as an appropriate support seeking strategy, and therefore may incorporate more indirect ways of seeking support, without explicitly presenting one's troubles to their close ones.

Friendship and Social Support. Social support is a coping strategy that occurs primarily within the context of close relationships (e.g., Bokhorst, Sumter, & Westenberg, 2010; Cable et al., 2013; Day & Livingstone, 2003; Leatham & Duck, 1990). According to the Relationship Enhancement Model of Social Support, supportive transactions between intimate partners have influences on the immediate stressful

events and also relate to the continuation, deterioration or dissolution of the intimate relationship (Cutrona et al., 2005). Current activation of social support from others or initiation of social support provision for others are closely associated with previous experiences in a specific relationship (Cutrona et al., 2005; Leatham & Duck, 1990). These support transactions in turn influence future relationship satisfactions (e.g., Lawrence et al., 2008) and the long term development of the relationship (Leatham & Duck, 1990).

Social support seeking and provision have been extensively studied in romantic relationships (e.g., Bolger et al., 2000; Bolger & Amarel, 2007; Cutrona et al., 2007; Don et al., 2013). Friendship, as one of the most important and frequent sources of support (Barbee, 1990; Day & Livingstone, 2003; Derlega, Barbee, & Winstead, 1994), warrants more in-depth examination. Having a high quality friendship has positive effects on child development, such as greater involvement at school and higher social acceptance (Berndt, 2002). As children grow older, their primary source of support begins to change (Bokhorst et al., 2010). Starting from adolescence (between age 16 to 18), friend support starts to exceed parent support for both boys and girls. Research has also shown that there are gender variations in the source of social support, with adult men benefitting more from family support (Cable et al., 2013) whereas adult women benefit equally from supportive friends and family (Day & Livingstone, 2003; Derlega et al., 1994). In addition, both men and women prefer to talk about their stressful issues with a same-sex friend (Barbee, 1990). However, it is unclear how cultural variations in friendship quality could influence social support seeking and provision behaviors. Hence, in the present study, we will be focusing on how supportive and negative friendships measured by self-reports could influence social support seeking and provision behaviors assessed in two experimental scenarios in Chinese vs. European-Canadian cultural contexts. Gender variations of social

support interactions will also be examined within these friendship dyads.

The Current Study. Despite the interdependent nature of close relationships, previous social support research only assessed how individual characteristics are related to their own support seeking or provision behaviors. The way in which partner's perceptions of their relationship (i.e., supportive vs. negative) influences actual social support seeking and provision behaviors has yet to be examined. Interpersonal relationships, such as friendship, often create "nonindependence" between the two members of a dyad because people in close relationships influence each other's cognition, emotions, and behaviors (Kelley & Thibaut, 1978; Kenny et al., 2006; Rusbult & Van Lange, 2008). Social support seeking is dependent on social support provision in previous occasions and it will also influence future social support seeking and provision (Cutrona et al., 2005; Leatham & Duck, 1990). Therefore, it is crucial to take into account the nonindependence between social support seeking and provision within friendship dyads.

The current study utilized the Actor-Partner Interdependence Model (APIM; Kenny et al., 2006) to evaluate the relational interdependence between the support seeker and support provider by its definition of actor and partner effects. An *actor effect* indicates how much a person's outcome variable is related to his/her own predictor, illustrated by the solid arrows in Figure 2(a). A *partner effect* indicates how much a person's outcome variable is associated with his/her partner's predictor, illustrated by the dash arrows in Figure 2(a). This dyadic design allows simultaneous estimations of both intrapersonal effects (i.e., actor effects) and interpersonal effects (i.e., partner effects) in one model.

Research Question 1: Does supportive friendship predict direct support seeking behaviors and positive responses? We hypothesized that a more supportive friendship in general will be associated with higher levels of direct support

seeking behaviors (actor effect for the support seeker) because the supportive relationship participants perceived is largely due to previous experiences shared between the two friends (e.g., Cutrona et al., 2005) and this positive relation creates a safe haven for friends to disclose their problems or concerns directly (e.g., Leatham & Duck, 1990). Similarly, supportive friendship was expected to associate with higher levels of supportive responses (actor effect for the support provider). Direct support seeking would be positively related to supportive responses from support providers after controlling for both actor and partner effects of supportive friendship, as shown in Figure 2(b).

Partner effects are the interpersonal effects that signify the mutual influences between the two members of the dyad (Kenny et al., 2006). Understanding the interpersonal aspects of social support is as important as understanding the intrapersonal effects (Rusbult & Van Lange, 2008). Given that the partner effects have not yet been examined within the framework of APIM in relation to social support seeking and social support provision among friends, we consider the main partner effects to be exploratory in this study and no specific hypothesis for partner effects were posited. Nevertheless, considering the reciprocality of social support transactions in intimate relationships (e.g., Barbee & Cunningham, 1995; Cutrona et al., 2005), the partner effects may have similar influences as the actor effects on the respective outcome variables. Moreover, culture and gender will be entered separately into each APIM model to create an interaction with supportive (and negative) friendship to predict social support seeking and provision behaviors.

Research Question 2: Does negative friendship predict indirect support seeking behaviors and negative responses? Negative friendship was expected to predict higher levels of indirect support seeking behaviors (actor effect for the help seeker). Previous negative interactions within the dyad might inhibit support seekers

to reveal their needs directly because they are fearful that their requests would be rejected or criticized (Barbee et al., 1993; Barbee & Cunningham, 1995; Don et al., 2013). Moreover, negative friendship would positively relate to negative responses (actor effect for the help provider). We also expected that indirect support seeking would positively relate to negative responses from support providers after controlling for both actor and partner effects of negative friendship as showed in Figure 2(c).

Research Question 3: Are there cultural variations in support seeking and provision behaviors? In line with H. S. Kim et al. (2008), we expected that Chinese participants in our study would use more indirect support seeking strategies than would Euro-Canadian participants. Since collectivistic cultural contexts influencing Chinese participants treat support provision as an obligation (H. S. Kim et al., 2008; Park et al., 2013; Taylor, 2007), Chinese participants were expected to be more inclined to provide support than Euro-Canadians participants even if they were provided the option to help only if they wanted to do so.

Research Question 4: Are there gender variations in support seeking and provision behaviors? As mentioned earlier, gender role expectations are similar in both "Western" and Chinese cultural contexts (Chueng, 1996; Granrose, 2006). Therefore, gender variations were not examined as nested within each cultural context, but across the two cultural contexts. We hypothesized that female participants would generally seek more help than male participants. Consistent with Barbee et al. (1993)'s theory of gender stereotype on social support, female participants were expected to have higher levels of support provision and received support compared to men.

Research Question 5: Are there temporal effects of using social support seeking and provision behaviors? In order to assess the temporal effects of social support seeking and social support provision, we analyzed specific support seeking

and provision behaviors across two experimental scenarios. To replicate the results obtained by Don et al. (2013), we expected that indirect support seeking behaviors in scenario 1 would be positively related to indirect support seeking behaviors in scenario 2, and negative responses in scenario 1 would also be positively related to negative responses in scenario 2 (actor effects). Indirect support seeking behaviors in scenario 1 would be positively related to negative responses in scenario 2, and negative responses in scenario 1 would be positively related to indirect support seeking in scenario 2 (partner effects). The same direction and effects were also expected for the relation between direct support seeking and supportive responses between scenario 1 and scenario 2. Cultural and gender variations were also taken into account in these cross-task examinations.

Methods

Participants. Participants were recruited in three ways: university participant pool advertisement; flyers posted on campus; and advertisements posted on local student association websites. Participants were asked to bring a same-sex non-romantic friend of a similar cultural background to the study. Euro-Canadian participants (36 female dyads, 12 male dyads, mean age = 21.42) were all born in Canada and self-identified as (a) having European heritage and (b) being "White (Caucasian)". Chinese participants (40 female dyads, 28 male dyads, mean age = 24.71) were all born in China and left China after the age of eight. The Chinese sample in this study consisted of either international students registered as full time university students (78%) or immigrants (22%). Students who were attending ESL classes were not recruited for this study. We refer to one of the participants (randomly assigned) in each dyad as the Target and his/her friend as the Friend. The Targets were asked to participate in various activities during the lab visit while the Friends were asked to

help during these activities.

Measures. *The Network of Relationships Inventory – Behavioral System Version* (NRI; Furman & Buhrmester, 2009) is a 24-item questionnaire that assesses supportive and negative interactions in different relationships using a five-point Likert-type scale (ranging from 1 = "Little or None" to 5 = "The Most"). For the purpose of this study, we asked participants to fill out the questionnaire online regarding their relationship with the friend they were planning to bring to the study.

Seven participants provided incomplete data on the NRI. Little's Missing Completely At Random (MCAR) tests were conducted for the Targets and the Friends separately to avoid statistical interdependence between participants. Results showed that responses were missing completely at random, $\chi^2(14) = 12.59$, $p = .56$ for the Targets and $\chi^2(23) = 15.28$, $p = .88$ for the Friends in the supportive interaction scale (15 items). The negative interaction scale (9 items) was also missing completely at random for the Friends, $\chi^2(7) = 11.78$, $p = .11$. There were no missing items for Targets in the negative interaction scale. Therefore, Maximum-Likelihood data imputations were employed for Targets and Friends separately in each scale (i.e., supportive and negative NRI scales) using the Expectation-Maximization algorithm (McKnight et al., 2007). Mean scores for each scale were then calculated.

Cronbach's alpha coefficients for the supportive interaction scale were .97 for Euro-Canadians and .96 for Chinese. Cronbach's alpha coefficients for the negative interaction scale were .81 for Euro-Canadians and .85 for Chinese.

Social support seeking behaviors were coded using the modified version of the Social Support Elicitation Behavior Code (SSEBC) developed by Cutrona, Suhr, and MacFarlane (1990). Since we are only interested in direct and indirect support seeking strategies, we have grouped together (a) the original strategies proposed by Cutrona et al. (1990), according to the conceptualization of verbal support seeking behaviors

in Barbee (1990), as well as (b) nonverbal support seeking behaviors conceptualized by M. S. Kim, Shin, and Cai (1998). Event sampling method was used to code six behaviors. Indirect support seeking (IDSS) was coded when the Target exhibited his/her difficulty in doing the task but did not indicate directly what kind of help was needed. Examples of IDSS include: "this is so difficult" or "Jesus!" Nonverbal example of IDSS includes: the Target stops the task and looks at the Friend with prolonged silence or sighing. The code of direct support seeking (DSS) was assigned if the behavior explicitly showed support was needed. For instance: "How can I draw a diagonal line?" or "What else can I talk about for the next 8 minutes?" Positive affect (PA), rejection of help (RSS), task related behaviors (TR), task unrelated behaviors (TU), and uncodable (UC; see full descriptions in Table 5) were also coded in this study, but they were not the focus of this study.

Social support provision behaviors were coded using the modified version of the Social Support Behavior Code (SSBC; Suhr, Cutrona, Krebs, & Jensen, 2004). The coding manual includes three supportive codes: Information support (IS), Emotional and esteem support (EES) and Tangible Support (TS). Since we were not interested in how specific support seeking strategies were matched or mismatched by supportive responses (Cutrona et al., 2007), the three supportive codes were combined to form one general supportive code (SS) as indications of supportive behaviors displayed by the helper. Negative behaviors (NB) were also coded. NB includes comments or behaviors that would jeopardize or discourage the completion of the task by discouraging, criticizing or complaining. An example would be, "your drawing looks terrible". PA, TR, TU and UC were also coded but not included in our analysis for this study.

Task stressfulness question is a one-item post-task assessment asking participants to indicate how stressed they felt during the task using a rating scale with 1 = not at all stressed to 10 = extremely stressed. Participants answered this question

independently on a piece of paper.

Procedures. Participants were instructed to fill out some online questionnaires prior to the laboratory visit with consent forms and debriefing forms presented in the online survey. During the lab visit, participants came in pairs and consent forms were signed before beginning any of the activities. Then, they were left alone inside the testing room for five minutes to habituate themselves to the lab environment. After, the experimenter instructed one of the participants (randomly assigned as the Target) to copy a picture depicting downtown Boston using an Etch-A-Sketch board in 10 minutes (Scenario 1). The experimenter then turned to the other participant (i.e., the Friend) and told the Friend that this was a task for the Target; he/she can help *if he/she wanted*, but he/she cannot do the task for the Target. Since the purpose of this study is to investigate how friends provide and ask for help during distress situations, this Etch-A-Sketch task presents a challenge that mimics a daily hassle, but it is not as threatening to the self-esteem as revealing a personal concern or solving a set of math problems (Mojaverian & Kim, 2013). Therefore, this task presents a low cost scenario to the Target and the Friend, allowing support seeking and provision to occur naturally without posing a serious threat to self-esteem and self-efficacy. Moreover, this task creates a structured environment for researchers to examine naturally occurring support seeking and provision behaviors in the laboratory setting.

After this Etch-A-Sketch task, participants completed several other filter tasks, such as filling out other questionnaires that were not relevant to the current study. After the filter tasks, the Target and his/her friend were introduced to the Webcam task (Scenario 2). During this activity, the experimenter told participants that the task was about making new friends. The Targets were instructed to make a 10-minute pre-recorded introduction of themselves to a same-sex peer who was from the same

cultural background. The Targets were then told that they could act as if they were trying to be friends with this peer and talk about whatever they saw fit when they wanted to make new friends. The Friend was again instructed to help the Target during the introduction *if he/she wanted*, but could not do the task for the Target. This task was first proposed by Pontari (2009) to examine how friends help socially anxious individuals to undergo stressful social situations. In contrast to the Etch-A-Sketch task, the Webcam task resembles a challenging social situation where a friend's assistance might be needed to develop new friendships with others.

Two different versions of the Webcam task were used. Webcam 1 (54 dyads) had a within-subject design wherein the Target participants first did the Webcam task alone first for 10 minutes and then a second time with the help of their friends. All Chinese participants were instructed to speak in English while recording the 10-minute introduction. However, participants revealed to the experimenters afterwards that talking in front of the webcam for 20 minutes was tiring. It had come to our attention that even though Chinese Target participants were instructed to use English in this task, when they turned to their friends for help, they often used Chinese to communicate with each other. In order to shorten the duration of the experiment and to improve the Webcam task for the Chinese participants, Webcam 2 (62 dyads) was administered as a between-subject design starting from the 55th dyad. Half of the Target participants were randomly assigned to do the Webcam task alone and the other half were randomly assigned to do the Webcam task together with their friends. Chinese participants were told they could use any language they felt most comfortable with during this task in order to reduce potential anxiety due to language related issues and in turn make their experiences of this task as close as possible to their Euro-Canadian counterparts.

When we compared all the coded behaviors between Webcam 1 and Webcam 2

using within- vs. between-subject design condition as the predictor in simple negative binomial regression, no significant differences were found in any of the coded behaviors. Furthermore, the Task Stressfulness Question indicated that there was no difference between Target participants' level of stress in the two conditions within the two cultural context, $F(1, 91) = 0.23$, $p = .63$ for the interaction between condition and cultural contexts. Neither main effect of condition, $F(1, 91) = 15.15$, $p = .05$, nor of cultural context, $F(1, 91) = 0.93$, $p = .34$, were significant. Therefore, we concluded that Webcam 2 is superior to Webcam 1 in terms of reducing fatigue for Target participants. However, it did not significantly change how friends interact with each other during a socially challenging situation. As a result, we decided to combine Webcam 1 and Webcam 2 for the analyses regarding the Webcam task with 36 Euro-Canadian dyads and 56 Chinese dyads.

The experimenter answered any questions the participants had before the start of each task. The gender of the experimenter was matched with the gender of the participants in each lab visit. Participants were asked to answer the Task Stress Question after the Etch-A-Sketch and the Webcam task. After answering the question on paper regarding the Webcam task, the experimenter thanked both participants and gave them debriefing forms. All participants chose from one of three compensation methods: 1) four participant pool credits if eligible; 2) two participant pool credits with $20 cash; 3) $20 cash only if not eligible for participant pool credits.

Social support seeking and provision behaviors were coded separately in the two aforementioned tasks by three coders (two English/French bilingual speakers and one Cantonese/Mandarin/English trilingual speaker). The trilingual coder coded both social support seeking and provision behaviors. The other two coders were assigned to code either support seeking or provision behaviors. Two coders coded 15% of the Euro-Canadian cases to determine interrater reliability for the Etch-A-Sketch task.

The general Kappa coefficients were .91 for SSEBC and .84 for SSBC. For the Webcam task, the general Kappa coefficients with 15% of the Euro-Canadian cases were .95 for SSEBC and .98 for SSBC. After interrater reliability had been established, the three coders coded the rest of the cases independently, but met at least twice a month to discuss any concerns or issues regarding the coding they had done in order to maintain interrater reliability until all cases were coded.

Results

In this section, all analyses regarding the two tasks (i.e., Etch-A-Sketch and Webcam) will be presented separately. Since we have used the event sampling method to code all behaviors in the two tasks, the data we obtained were frequency count data, which might not fit in a normal distribution. Distribution fit analysis (Sheppard, 2012) showed that all coded variables of interest fitted best to negative binomial distributions. Therefore, in this study, we used analyses that were suitable for negative binomial distributions unless otherwise specified.

Etch-A-Sketch Task.

Descriptive Statistics and Correlations. Table 6 presents the means and standard deviations, and Table 7 presents the correlations of all variables for Euro-Canadian and Chinese participants. Due to the negative binomial distributed count data for all our coded dependent variables, generalized linear models with negative binomial log link function were used to compare gender differences on social support seeking provision behaviors within Chinese and Euro-Canadian participants (Table 8).

Actor-Partner Interdependence Model Effects for Etch-A-Sketch Task. The Generalized estimating equation (GEE) was used to estimate the parameters of APIM as suggested by Loeys and Molenberghs (2013) for analyzing count data with

negative binomial distributions. The two-intercept approach was used in this study where predictors for each member of the dyad (i.e., one Target and one Friend) were entered separately, creating two separate equations with two separate intercepts: one for the Target and one for the Friend (Kenny et al., 2006; Loeys & Molenberghs, 2013). The results can be directly interpreted by their roles as the Target or the Friend, taking into account both the interpersonal and intrapersonal effects of the independent variables: in our case, supportive or negative interactions among same-sex friends (Kenny & Kashy, 2011; Wickham & Knee, 2012).

Two sets of APIMs were conducted. Model 1: Cultural group (coded as Chinese = 1, Euro-Canadians = -1) was entered into the Standard APIM to create a three-way interaction, as illustrated in Figures 3(a) and 3(c); Model 2: Gender (coded as female = 1, male = -1) was entered into the Standard APIM to create a three-way interaction, as illustrated in Figures 3(b) and 3(d). Only models with significant Wald chi-square test estimates were displayed in Table 9. Marginal R^2s were also presented in all APIM effect tables. The exponentiated parameters, also known as the Rate Ratios (*RRs*), indicated the amount of change in the dependent variables for each *SD* increase in the independent variables, controlling for all other effects in the model (Hilbe, 2011; Loeys, Cook, De Smet, Wietzker, & Buysse, in press). Four-way interactions using cultural group by gender as the interaction term were not conducted due to the complexity of interpretations with multiple categorical predictors.

Research Questions 1, 3 & 4: In the analyses for the relation between DSS and supportive responses, as illustrated in Figures 3(a) and 3(b), no significant cultural variations were obtained using APIM with cultural contexts as a moderator (Model 1). However, there was a significant gender variation (Model 2) for the Friend's actor effect in predicting supportive behaviors (see Figure 3(a); *Research Question 4*). No actor or partner main effects significantly predicted either DSS or supportive

responses in this model. The significant three-way interaction for gender indicated that with one unit increase in the Friend's supportive interaction of NRI, there was a 20.8%[4] increase in supportive responses provided by female Friends and a 20.6% decrease by male Friends (actor effect for *Research Questions 1 & 4*). The partial correlation between DSS and supportive responses was .74 in Model 2 after controlling for all the actor and partner effects (*Research Question 1*).

Research Questions 2, 3 & 4: For the analyses regarding the relation between IDSS and NB (Figures 3(c) and 3(d)), there was a significant cultural variation for the Friend's partner effect (see Table 9). No actor or partner main effects were significant in predicting either IDSS or negative responses in this model. The significant three-way interaction showed that with one unit increase in the Friend's negative NRI, there was about 58.6% increase in IDSS among Chinese Target participants, whereas there was a 52.1% decrease in IDSS among Euro-Canadian Target participants (partner effects for *Research Questions 2 & 3*), illustrated in Figure 3(b). The partial correlation between IDSS and negative responses was .16 in Model 1 after controlling for all the actor and partner effects (*Research Question 2*). In contrast to the analyses for DSS and supportive responses, there was no gender variation in the APIM Model 2.

Webcam Task.

Descriptive Statistics and Correlations. Table 10 presents the correlations of all variables for Euro-Canadian and Chinese participants during the Webcam task. Generalized linear models with negative binomial log link function were also used to compare gender differences on social support seeking and provision behaviors within Chinese and Euro-Canadian cultural contexts in this task (Table 8).

[4]This interpretation of *RRs* was suggested by Hilbe (2011) and Loeys and Molenberghs (2013).

Actor-Partner Interdependence Model Effects for Webcam Task. *Research Questions 1, 3 & 4:* The same two sets of APIM analyses as in the Etch-A-Sketch task were conducted for the Webcam task: Model 1 used cultural contexts as the moderator (see Figures 3(a) and 3(c)) and Model 2 used gender as the moderator to create two separate three-way interaction models (see Figures 3(b) and 3(d)). In the analyses for the relation between DSS and supportive responses, similar to the results found in the Etch-A-Sketch task, there was no cultural variation in the APIM (Model 1); there were, however, gender variations in Model 2 (see Table 9). First, there was a significant actor main effect for supportive NRI of the Friend. Supportive responses would increase by about 23% with one unit increase in supportive NRI from the Friend (actor effect for *Research Question 1*). Secondly, there were significant gender variations in the Target's actor effect and the Friend's partner effect. Specifically, one unit increase in Target participants' supportive NRI was associated with a 30.9% decrease in DSS among female Target participants and a 64.5% increase among male Target participants (Figure 5(a); actor effect for *Research Questions 1 & 4*). The significant partner effect indicated that with one unit increase of supportive NRI from the Friend, there would be an 11.2% decrease in DSS among female Target participants and a 47.2% increase among male Target participants (Figure 5(b); actor effect for *Research Question 1*). The partial correlation between DSS and supportive responses was .10 in Model 2 after controlling for all the actor and partner effects (*Research Question 1*).

Research Questions 2, 3 & 4: In the analyses for the relation between IDSS and negative responses, in contrast to the Etch-A-Sketch task, there were no cultural variations in Model 1 but there were gender variations in the Target's actor effect predicting IDSS in Model 2 (see Table 9). Target's actor main effect and the Friend's partner main effect also positively predicted IDSS (*Research Question 2*). The sig-

nificant three-way interaction indicated that higher levels of negative NRI in Target participants was related to less IDSS (i.e., about a 0.2% decrease) among female Target participants and more IDSS (i.e., about a 211.6% increase) among male Target participants (actor effect for *Research Question 2*). In other words, the main effect from Target participants observed in the model was mainly driven by male Target participants (Figure 6). In contrast to our prediction, the partial correlation between IDSS and negative responses was $-.11$ in Model 2 after controlling for all the actor and partner effects.

Cross Task Examinations. *Research Question 5:* In this section, social support seeking and provision behaviors observed in the Etch-A-Sketch task were used to predict support seeking and provision behaviors in the Webcam task with cultural context and gender as moderators in separate models (see Figure 7).

DSS and Supportive Responses. For the analyses regarding DSS and supportive responses, there were both cultural group (Model 1) and gender variations (Model 2) in support seeking and provision behaviors across the two tasks (Table 11). The Friend's supportive responses in Etch-A-Sketch task were positively related to the intrapersonal effect on supportive responses and the interpersonal effect of DSS during the Webcam task (*Research Question 1*). The significant three-way interaction using cultural context as the moderator indicated that with every additional occurrence of the Friend's supportive response in the Etch-A-Sketch task, there would be a 0.04% decrease in supportive responses among Chinese Friends and a 1.6% increase among Euro-Canadian Friends in the Webcam task (see Figure 8(a); Friend's actor effect for *Research Question 5*). Furthermore, the partner effect of the Friend showed that with their supportive responses increased by one in the Etch-A-Sketch task, DSS would increase by 0.4% for the Chinese Target participants and 5.4% for Euro-Canadian Target participants (see Figure 8(d); *Research Question 5*). The partial correlation

between DSS and supportive responses was .17 in Model 1 after controlling for all the actor and partner effects.

Gender was also a significant moderator in the APIM Model 2 (see Figure 7(b)). Results showed that Target participants' use of DSS in the Etch-A-Sketch task was positively related to the number of DSS they used in the Webcam task (Table 11; actor effect for *Research Question 1*). Moreover, with one unit increase in the Friend's supportive responses in the Etch-A-Sketch task, there would be about a 1.3% increase in supportive responses among female dyads and about a 0.8% decrease among male dyads in the Webcam task (Figure 9(a); actor effect for *Research Questions 1 & 4*); DSS would decrease by 1.6% among female dyads and increase by 4.1% among male dyads in the Webcam task (Figure 9(c); partner effect). The partial correlation between DSS and supportive responses was .24 in Model 2 after controlling for all the actor and partner effects (*Research Question 1*).

IDSS and Negative Responses. There were both cultural (Model 1; Figure 7(c)) and gender variations (Model 2; Figure 7(d)) across the two tasks. Model estimates were presented in Table 11. There was a significant main actor effect for the Friend (*Research Question 2*). Furthermore, Target's use of IDSS in the Etch-A-Sketch task was related to the Friend's negative response in Webcam task. Specifically, with every additional use of IDSS during Etch-A-Sketch task, there would be about a 10.4% decrease in NB among Chinese participants and about 2.6% increase in NB among Euro-Canadian participants in Webcam task (partner effect for *Research Questions 2 & 4*; see Figure 10(a)). The Friend's actor effect also indicated that one unit increase of NB in Etch-A-Sketch task was associated with a 16.1% increase of NB among Chinese participants and a 2.4% increase among Euro-Canadian participants during Webcam task (*Research Question 2*; see Figure 10(b)). The partial correlation between IDSS and negative responses was close to zero (−.02) in Model

1 after controlling for all the actor and partner effects.

In Model 2, there was a partner main effect for Target participants (see Table 11). Only one significant gender variation was observed in Model 2 for the Target's partner effect. The use of IDSS in Etch-A-Sketch task was positively related to increased NB among female dyads (a 0.7% increase with every additional use of IDSS; partner effect for *Research Question 2*) and decreased NB among male participants (a 17.8% decrease with every additional use of IDSS; Figure 11). The partial correlation between IDSS and negative responses was close to zero (−.06) in Model 2 after controlling for all the actor and partner effects.

Discussion

There has been strong evidence of social support playing an important role in individual well-being and the development of intimate relationships (Cutrona et al., 2005; Park et al., 2013; Taylor, 2007). The behavioral exchange of social support seeking and provision are rarely examined among same-sex friends. While there have been theories regarding cultural and gender variations in social support, empirical studies examining both social support seeking and provision behaviors simultaneously are scarce, with a few exceptions (e.g., Cutrona et al., 2007; Don et al., 2013; Mojaverian & Kim, 2013). Some studies, while examining support transactions using observational data, may have ignored the fact that count data fit better in a discrete distribution (e.g., Poisson or Negative binomial) than in a normal distribution (Hox, 2010). The violation of normality assumptions in these analyses may severely compromise the accuracy of the model estimates (Loeys & Molenberghs, 2013). The GEE-approach used for analyzing Actor-Partner Interdependence Models in this study provided appropriate estimates for count outcome variables (Loeys & Molenberghs, 2013). Our goal in this study was to identify not only intrapersonal

(i.e., actor effects) but also interpersonal effects (i.e., partner effects) of friendship quality on social support seeking and provision behaviors, taking cultural and gender variations into consideration.

In general, consistent with our predictions and previous theorizations of the relation between social support seeking and provision (Barbee et al., 1993; Barbee & Cunningham, 1995), direct support seeking was indeed positively related to supportive responses after controlling for actor and partner effects of friendship quality in both Etch-A-Sketch and Webcam tasks. Indirect support seeking was also found to be positively related to negative responses in Etch-A-Sketch task after controlling for actor and partner effects of negative interactions assessed in the Network of Relationship Inventory. However, this was not the case during Webcam task. In fact, Pearson correlations in Table 10 showed that indirect support seeking was negatively related to NB for Chinese dyads, but positively related to NB for Euro-Canadian dyads. Even though neither of the coefficients was significant (perhaps due to the skewness of the count data; Loeys et al., in press), these results suggest that using indirect support seeking during socially challenging situations can elicit more NB among Euro-Canadian dyads as suggested by Barbee and Cunningham (1995), and Don et al. (2013), but not among Chinese dyads.

Cultural Effects. No cultural variations were found in the analyses for direct support seeking. In fact, the frequencies of direct support seeking was higher for Chinese participants than for Euro-Canadian participants. These results were different from previous studies of cultural variations on perceived and actual social support seeking (e.g., H. S. Kim, Sherman, Ko, & Taylor, 2006; H. S. Kim et al., 2008; Mojaverian & Kim, 2013). In both of our experimental tasks, the help seekers and the help providers were informed the purpose of the tasks together. Consequently, the explicit activation of social support in our experiment was achieved by the experimenters

informing the Target to do the tasks and the Friend to help if she/he wanted. Once the support activation was achieved by revealing the nature of the stressful events, Chinese participants no longer hesitated to ask for help directly because the Friend's role to help had been clearly defined and the need for help was justified (Park et al., 2013). The Friend's help therefore is expected, based on social obligations in Chinese cultural contexts (H. S. Kim et al., 2008; Adams & Plaut, 2003). In other words, the Friend's role to help has become a social obligation according to the experimental instruction for the Chinese dyads. However, the need for support may still signal a loss of independence and self-efficacy among Euro-Canadian dyads, where helping is not an obligation but an act of one's own volition (Park et al., 2013).

Another explanation is rooted in the fact that most of the experimental studies on culture and social support were not examined in closed relationships (e.g., using confederates; Mojaverian & Kim, 2013) nor on actual support seeking behaviors (e.g., self-report support seeking; H. S. Kim et al., 2006). Therefore, previous studies have only revealed cultural variations on the perception of social support seeking across relationships. Interestingly, when friendship qualities were taken into account in our analyses, there were no significant cultural variations found for direct support seeking. Since social support often occurs within intimate relationships (Leatham & Duck, 1990), it is most relevant to examine support seeking behaviors during specific behavioral transactions to understand the use of support seeking behaviors in specific relationships. Furthermore, cross task examination also showed cultural variations for direct support seeking and supportive responses. The frequencies of supportive responses did not seem to change from one task to another for Chinese Friends (see Figures 8a and b).

According to the conceptualizations of independent and interdependent self-construals (Markus & Kitayama, 2010), collectivistic cultural contexts emphasize the definition

the self in terms of relationships. Helping was considered a more important content for defining friendship among Chinese children and adolescents compared to their counterparts from individualistic cultural contexts (Gummerum & Keller, 2008). On the one hand, friendship qualities that were pre-defined by many previous occasions and social obligations in friendships play greater roles in predicting support seeking and provision regardless of the current situation for Chinese participants. On the other hand, Euro-Canadian participants are much more susceptible to immediate situational changes from task to task because individualistic cultural contexts foster assumptions such that it is out of the helper's own accord to offer assistance or not. As a result, Euro-Canadian participants were more sensitive to the situational effect of direct support seeking and supportive response than were Chinese participants.

By analyzing both actor and partner effects simultaneously, this study provided important evidence of partner effects in social support processes. For instance, the partner effects of friendship quality played a crucial role in predicting cultural variations in support seeking behaviors. In the Etch-A-Sketch task, negative interactions rated by the Friend were associated with more use of indirect support seeking among Chinese Target participants, but less use of indirect support seeking among Euro-Canadian Target participants. These findings partially support the existing literature about cultural variations in social support seeking (H. S. Kim et al., 2006, 2008). When negative interactions were taken into account among same-sex peers, Chinese participants favored the use of indirect ways of support seeking, which do not involve directly disclosing one's problems. Consistent with previous conceptualization on culture and social support (H. S. Kim et al., 2008; Park et al., 2013), it was inappropriate to explicitly reveal one's problems to burden others. As a result, indirect support seeking may have been considered a more adaptive support seeking strategy in the Chinese cultural context. This is also supported by our results in

the cross task examination. Indirect support seeking in Etch-A-Sketch task was positively related to NB for Euro-Canadian participants but negatively related to NB for Chinese participants during Webcam task. While the use of indirect support seeking may negatively impact Euro-Canadian participants by eliciting more NB (Barbee & Cunningham, 1995; Don et al., 2013), Chinese participants have higher tolerance for indirect support seeking, which was in turn associated with less NB.

Gender Effects. Consistent with our predictions, supportive interactions among peers were associated with more actual supportive responses, with female participants providing higher rates of support during Etch-A-Sketch task. As explained by Barbee et al. (1993), gender role expectations of females being warm and nurturing might have socialized women to be more active in support provision. In contrast, if the friend provides support toward their male friends, it may pose a threat to males' independence and may be perceived as undermining the person's competence (Barbee et al., 1993; Bolger & Amarel, 2007), thus hindering the activation of supportive responses in male dyads.

Moreover, support seekers who reported higher ratings on supportive interactions were more likely to use direct support seeking as their support seeking strategy (actor effect). It is conceivable that supportive friendships could foster a positive and safe environment for social interactions to occur (Cutrona et al., 2005). As a result, the potential risk of undermining one's competence in solving a problem has been minimized and support seekers are then willing to ask for help directly. This was more apparent for male participants than for female participants during the Webcam task. Cross task examination also indicated that more supportive responses displayed during Etch-A-Sketch task were related to more use of direct support seeking during the Webcam task for male participants and almost no change for female participants. These gender variations revealed that both perceptions of a supportive friendship

and actual provisions of supportive responses are crucial for activating direct support seeking among male dyads. The original conceptualization of gender effect on support seeking behaviors in Barbee et al. (1993) was based on the fact that men's diminished use of indirect support seeking or direct support seeking is due to their fear of potential threat to their self-esteem as an independent and competent person. Once this threat to the self is removed or minimized, such as being in a supportive relationship where actual supportive responses are available, direct support seeking becomes a desirable way of seeking support for men as well.

During the Webcam task, the Friends' perceptions on supportive interactions were related to less direct support seeking among female Targets and more direct support seeking among male Targets (partner effect). This partner effect is very similar to the actor effect we have observed in the same model. Not only does the Target's perception of friendship quality influence the Target's own actual social support seeking behaviors but their partner's perception of friendship quality also influences the Target's support seeking behaviors. Members within close relationships have mutual influences on each other's emotions, cognitions and behaviors (e.g., Kelley & Thibaut, 1978; Wickham & Knee, 2012). The partner effect obtained here provides empirical evidence to this relational interdependence between same-sex peers.

If male Targets sensed there were high levels of conflicts and criticism with their same-sex peers, they would use much more indirect support seeking than female participants to prevent directly disclosing one's problems in order to avoid implicating their incompetence. In sum, the gender effect of support seeking is highly dependent on relationship qualities within each dyad. Furthermore, indirect support seeking in Etch-A-Sketch task was significantly related to more NB in Webcam task for female participants but less NB for male participants in the cross task examination. In our study, this partner effect added behavioral evidence to Don et al.'s (2013) claim

that indirect support seeking could lead to more negative responses, but only for female participants. The partner effect of male participants suggests that males are differentially responsive to indirect support seeking. Since gender was not investigated in Don et al. (2013), our study presented additional behavioral evidence to the existing literature of gender variations on the relation between indirect support seeking and negative behaviors during social support transactions.

Limitations and Future Directions. There were a lot of variations in the Etch-A-Sketch task vs. the Webcam task. Actual support seeking and provision behaviors differed across the two experimental tasks when supportive and negative peer interactions were taken into account. The differential results in these two tasks indicated that social support seeking and provision are context dependent. It is important for research in social support to pay more attention to the context where support is elicited and provided, and move away from treating all personal stressful events as the same even if the levels of stress are similar. Due to the complexities of the models we analyzed, it was not possible to examine the interaction between cultural group and gender. However, our results do suggest that gender should be a focal component, not a controlled variable, when examining social support in cross cultural studies.

Cultural contexts shape people's understanding and perception of relationships and social support, which in turn influence their responses to support seeking and provision (Jacobson, 1987; Taylor et al., 2004). Future cultural/cross cultural studies of social support should employ not only self-reports but also observed behavioral measures to investigate how and when perceived support is being translated into actual supportive/negative responses in close relationships. Furthermore, previous studies demonstrated that people from East Asian cultural contexts used less direct support seeking than people from Euro-American cultural contexts (e.g., H. S. Kim

et al., 2008; S. Wang et al., 2010). Our study showed that once the stressful event is revealed, Chinese participants were equally likely to use direct support seeking behaviors to elicit help from their friends as the Euro-Canadian participants, and they were also more tolerant towards the use of indirect support seeking with less negative responses. Future interventions to improve social support, especially for populations from Asian cultural contexts, could focus not only on the positive styles for effective communications (Cutrona, 1996), but also on how to break the ice and openly reveal stressful issues so that help seekers would be more comfortable in directly soliciting support from others. Furthermore, this study focused on dyads that have the same gender and same cultural backgrounds. With the diverse ethnic structure in the North American society where intergroup interactions are frequent, it is imperative to extend this line of research to intergroup relationships (e.g., between an Euro-Canadian Target and a Japanese-Canadian Friend) in order to further unpack the cultural influences on social interactions and relationships in future studies.

Concluding Remarks. This study used Actor-Partner Interdependence Model to analyze cultural influences (Chinese vs. Euro-Canadian) on three levels of social complexity in same-sex friends' social support experiences – interactions (i.e., social support seeking and provision), relationships (i.e., friendship quality), and groups (i.e., gender variations; Hinde, 1987). This approach provides researchers with convenient and thorough investigations of multiple levels of analysis simultaneously in social relationships. Using dyads as the unit of analysis demonstrated that both *actor* and *partner* effects of friendship quality had significant influences on peer interactions, especially for support seeking behaviors. Cultural and gender variations of social support were embedded in both intrapersonal (actor) and interpersonal (actor) effects. The Actor-Partner Interdependence Model used in this study preserved the partner influences on social support, which is often lost in studies with a sole focus on actor ef-

fects. The analyses using GEE provides not only more accurate estimates of negative binomially distributed count data [5], this analytic strategy in light of Actor-Partner Interdependence Model also presents an avenue to examine dynamic social behaviors in any interpersonal relationships where nonindependence is a concern. This study paved the passage to (1) move away from focusing analysis on only the individual level, and (2) to incorporate relationship, group and cultural effects in the analysis of a single integrated model. The analysis containing multiple levels of social complexity is particularly beneficial for cultural/cross cultural psychology research. The complex interrelations between sociocultural contexts and the different levels of social complexity should not be overlooked in the social sciences; work in this vein can help to determine *how* and *when* "culture matters".

[5]This model could apply to binary outcome variables by changing the link function to Logit (Loeys et al., in press).

General Discussion

This dissertation examined the influences of the reciprocally constructed self and culture on psychological and behavioural processes. The overarching purpose of this dissertation was twofold. First, this work contended that human psychological tendencies and social behaviours are best understood in their sociocultural context, and cannot be separated from it. Second, the two manuscripts presented above illustrated the applications of two conceptual and methodological frameworks for unpacking cultural variations in social anxiety and social support interactions. The first approach was proposed by Norenzayan and Heine (2005) to compare two and/or three different cultural contexts to determine the generality of a psychological phenomena cross culturally. The second approach, mostly adopted in studies of peer relations (e.g., Chen & Rubin, 2011; Rubin et al., 2006), utilizes different levels of social complexity analysis to capture individual, dyadic, relationship, and group effects (Hinde, 1987). The following discussion will elaborate on how the aim of the current dissertation is revealed and explicated in the two manuscripts accordingly.

Two vs. Three Cultural Contexts Comparison: When Norenzayan and Heine meet Markus and Kitayama

There have been decades of cross cultural studies of social anxiety (e.g., Dinnel et al., 2002; Good & Kleinman, 1985; Hong & Woody, 2007; Kirmayer, 1991; Takahashi, 1989; Takano, 1977). While there are often elevated levels of self-reported social anxiety among East Asian participants (e.g., Hong & Woody, 2007; Kleinknecht et al., 1997), epidemiological reports showed lower prevalence rates of social anxiety disorder in East Asia than in North America (e.g., Hofmann et al., 2010). Cultural variations exist in social anxiety and social anxiety disorder; however, researchers in this field have just started to explain (or unpack) the cultural variations we often observed.

The most prevalent explanation for the cultural variation in social anxiety is grounded in the differential cultural views of the self (i.e., independent vs. interdependent self-construal). *Manuscript 1* examined not only the mediating effects of the two self-construals but also the mediating effect of intolerance of uncertainty in predicting social anxiety and OTKS in different cultural contexts.

The merits of using parallel multiple mediation model are twofold. First, all mediators are entered in the model at the same time and the indirect effect of each mediator is unique after controlling for all other effects in the model. Unlike other studies that examine only one mediator at a time (e.g., Hong & Woody, 2007), this approach presents a more complex and exhaustive model for the examination of cultural variations in social anxiety and OTKS when all mediators are taken into account in the same model (Hayes, 2013). Second, the parallel multiple mediation model not only describes but also explains the cultural variations in social anxiety and OTKS through the effects of intolerance of uncertainty, independent and interdependent self-construals. In order words, the mediation model tells the story of *how* "culture matters" in the study of social anxiety and OTKS.

The first study in *Manuscript 1* used the Two Cultural Contexts Comparison approach to test the effects of the three mediators on social anxiety and OTKS between the Euro-Canadian vs. Chinese cultural contexts (i.e., a typical "East" vs. "West" comparison). The second study extended the same model to a Three Cultural Contexts Comparison approach among participants from Euro-Canadian, Chinese and Japanese cultural contexts. The second study preserves the "East" vs. "West" comparison while dissecting both cognitive (i.e., intolerance of uncertainty, independent and interdependent self-construals) and sociocultural influences on social anxiety and OTKS. The results of *Manuscript 1* points to both psychological universality and cultural variability in these two psychological processes. Both social anxiety and

OTKS are positively correlated with intolerance of uncertainty across all cultural contexts. However, the mediating effect of intolerance of uncertainty differs depending on the specific cultural group comparisons (e.g., Euro-Canadian vs. Chinese or Euro-Canadian vs. Japanese; see Tables 2 and 3). Furthermore, there are many cultural variations evident in the correlations between self-construals and social anxiety (and OTKS; also see Tables 2 and 3). This is partly due to the measurement issues of self-construals, which will be discussed further in details in the Limitation and Future Directions section.

The self is essentially social, which in turn is cultural (Hinde, 1987, 1997; Markus & Kitayama, 2010; Ryder et al., 2011; Vygotsky, 1978). The mutual constitution between the self and culture is a dynamic ongoing process. Therefore, it is important to consider psychological phenomena not as entities but rather as processes that are evolving with the sociocultural contexts (Markus & Kitayama, 1991, 2010). For instance, the significant indirect effect of intolerance of uncertainty in Study 1 disappeared in Study 2 when we compared Euro-Canadians with Chinese from mainland China. These results on the one hand confirm with previous studies that there is a mean difference between the two ethnocultural contexts in social anxiety (e.g., Dinnel et al., 2002; Kleinknecht et al., 1997). However, on the other hand, whether the difference of intolerance of uncertainty is attributing to the mean difference of social anxiety observed between the two ethnocultural contexts depends on the *local* sociocultural contexts. Recent examinations of *local* sociocultural contexts illustrate that each local context has its own ecology, history and subtle ways of defining who we are, how to be, and how to be well (Kitayama et al., 2010; Plaut et al., 2012). It is precisely because of these implicit and subtle ways (modes) of being scripted locally, not only *culture*, but *place* (i.e., local sociocultural context) also matters for the development and manifestation of certain psychological processes or even psy-

chopathology (e.g., Heine et al., 2002; Plaut et al., 2012). Furthermore, the use of Two Cultural vs. Three Cultural Contexts Comparison approaches in combination with the analytical approach of parallel multiple mediation model in *Manuscript 1* depicted a simple but elaborated research strategy of unpacking cultural variations in psychological processes.

Social Support within Social Complexity: When Hinde meets Cutrona, Barbee and Kim

Manuscript 2 strived to comply with the conceptual and methodological framework proposed by Hinde (1987, 1997) and Rubin et al. (2006) to examine social support behaviours among same-sex peers. According to Hinde (1987, 1997), *individual behaviour* is influenced by what we think and feel; what we think and feel is influenced by what we do. This complex interplay between the mind and behaviour will become even more sophisticated when we are *interacting* with others. One's own attention, emotion and behaviour in this case will take into account of the emotion and behaviour of whom we are interacting with. How we interact with others is dictated by our *relationship* with them. Relationships are in fact created and maintained by a series of interactions. Furthermore, both interactions and relationships are embedded in *groups* (e.g., gender groups). As explained in the General Introduction, all the levels of social complexity are indeed affected by and in turn affecting sociocultural contexts.

Social support has many benefits in health and well-being (e.g., Bolger et al., 2000; Cable et al., 2013; Masters et al., 2007; Schuster et al., 1990; Wonderlich-Tierney & Vander Wal, 2010). A full examination of social support at both the dyadic and group levels have never been done according to my knowledge. Even though cultural variations have been discussed in the field of social support, the sociocultural

influences are often examined separately and detached from all the other levels of social complexity in previous studies (e.g., H. S. Kim & Markus, 1999; H. S. Kim et al., 2006; Taylor et al., 2004; Taylor, 2007). *Manuscript 2* used the Actor-Partner Interdependence Model (Kenny et al., 2006) to account for the effects of different levels of social complexity (i.e., interaction, relationship and group) as well as cultural variability in social support transactions.

The key advantage of Actor-Partner Interdependence Model is its ability to analyze dyadic data when nonindepedence of the data is inevitable and must be accounted for (Kelley & Thibaut, 1978; Kenny et al., 2006; Wickham & Knee, 2012). Actor-Partner Interdependence Model provides not only intrapersonal effects (i.e., actor effects) but also interpersonal effects (i.e., partner effect; see Figure 2). Indeed, results showed that both intrapersonal and interpersonal effects were present in our models. This suggests that when examining social behaviours, more specifically, social interactions, it is crucial to consider effects from both interactants. Failing to do so, important information might be overlooked, and eventually it might lead to biased conclusions that greatly limit the generality of the effects. Furthermore, the significant cultural related interactions indicated that the complex interplay between culture and the self is also reflected in both intrapersonal and interpersonal effects. The interpersonal and intrapersonal effects also provided important elements for explaining the gender variations observed in *Manuscript 2*.

With the multilevel modeling approach used in analyzing Actor-Partner Interdependence Model, researchers could easily obtain the partial correlation between the dyadic members on the outcome variables after controlling for all actor and partner effects in the model (Kenny & Kashy, 2011; Loeys et al., in press; Loeys & Molenberghs, 2013). In the case of *Manuscript 2*, this is particularly important. Social support transactions involve two basic behavioural components: support seeking and

support provision (i.e., outcome variables in our models) from two members within a friendship dyad. These two behavioural components combined dynamically to construct social support interactions between the two friends. The nature and patterns of these dynamic social support interactions are determined by their past experiences in similar situations and expectations of the current situation within this particular relationship. How they form and continue their friendship is then determined partly by their past interactions, partly by the current interactions, and partly by social norms and practices that are prevalent in the larger social groups. The seemingly simple correlation between support seeking and support provision behaviours is tainted by several levels of effects in social complexity. Actor-Partner Interdependence Model can indeed estimate the correlation between the support seeking and support provision behaviours (i.e., the level of interactions) accounting for cultural variability, gender effects (i.e., the level of group) and dyadic perceptions of the friendship (supportive vs. negative; i.e., the level of relationship).

As Hinde (1997) pointed out that the study of interactions and relationships must require both objective and subjective data. Agreeing with Hinde wholeheartedly, *Manuscript 2* obtained participants' perceptions on supportive vs. negative interactions through self-reports as the subjective measures, and analyzed each friendship dyad's naturally occurring social support interactions as our objective measures. The results of this study revealed that how participants' perceptions on their friendship could influence their actual social support seeking and provision behaviours (i.e., what we do is influenced by what we think and feel). The analysis of the social support interactions here reflected the aspects of the friendship between the two friends that are closely related to social support. The behaviours we observed and analyzed during the social support interactions is not the examination of the relationship itself because relationships are comprised of many types of interactions. In order words,

Manuscript 2 is an investigation of social support within friendships, but not an investigation of friendship itself. However, by examining and understanding both supportive and negative aspects of social support, results obtained in the analyses could facilitate a better understanding of the different characteristics of friendship. Taking all together, despite the conceptual and analytical challenges in scrutinizing multiple levels of social complexity (Chen & Rubin, 2011; Hinde, 1987, 1997; Rubin et al., 2006), *Manuscript 2* aspired to apply multiple levels of analysis to examine social support interactions among same-sex peers in two cultural contexts. This was made possible by both theoretical advances in social support (e.g., Cutrona et al., 2005; Barbee et al., 1993; H. S. Kim et al., 2006), and analytical advances in multilevel modeling (Hox, 2010; Kenny & Kashy, 2011) and Actor-Partner Interdependence Model (Kenny et al., 2006; Loeys & Molenberghs, 2013).

Limitations and Future Directions

The current dissertation offers potential conceptual and methodological advances for cultural/cross cultural research. However, the current studies have several limitations that could inform future studies in the field of sociocultural research. First, even though both manuscripts emphasize the importance of sociocultural contexts on psychological processes and social behaviours, socioeconomic context has been neglected in both manuscripts. Socioeconomic status (SES) has been showed to relate to health issues (Adler & Ostrove, 1999), and this is particularly important for immigrant populations (Lau et al., 2013). When cross cultural comparison is conducted, it is challenging to measure SES in a meaningful way so that it could provide comparable index cross culturally. The MacArthur ladder (Adler, Epel, Castellazzo, & Ickovics, 2000) has been a valid and reliable indicator of subjective measure of SES in predicting health outcomes (Operario, Adler, & Williams, 2004). Future studies

should also consider the intricate interplay between SES and sociocultural contexts in sociocultural research.

Secondly, as alluded in the discussion above, the use of self-reports for measuring self-construals is problematic. Singelis' (1994) measure of the cultural views of the self used in *Manuscript 1* is the most commonly used one in the field. Even though Singelis' conceptualization of the measure is simple and easy to understand, this measure focuses only on the use of explicit attitude towards the self, and the self in relation to others to quantify the cultural differences. Since sociocultural contexts are tacit and always evolving, it is not clear when and to what extend culture can be reduced to personal values, beliefs, and/or behaviours (Markus & Kitayama, 2010; Kitayama & Park, 2007). On this front, the use of self-reports to measure self-construals may be called into question. Future research involving self-construals should seek to incorporate multiple methods in examining the influence of sociocultural contexts, such as priming techniques in eliciting salient cultural frameworks (e.g., individualism vs. collectivism; Oyserman & Lee, 2008).

Furthermore, recent research has shown that the effect of intolerance of uncertainty on social anxiety is over and above the effect of fear of negative evaluation (Boelen & Reijntjes, 2009; Carleton et al., 2010), and the fear of positive evaluation has also been shown to relate to social anxiety (Weeks & Howell, 2012). Given the conceptualization of intolerance of uncertainty that people's intolerance of uncertainty stems from their ultimate fear that negative events may occur (Dugas et al., 2004), it is important to examine the exact relation between fear of negative (or positive) evaluation and intolerance of uncertainty in predicting social anxiety and OTKS. In this case, more complex models such as serial mediation models using intolerance of uncertainty and the fear of negative (or positive) evaluation as *serial* mediators can further determine whether intolerance of uncertainty is the antecedent of fear of negative evaluation (or

fear of positive evaluation) in predicting social anxiety and OTKS, or vice versa.

Manuscript 1 used the traditional "East" vs. "West" comparison with additional examinations on specific sociocultural contexts, such as Chinese migrants in Canada vs. Chinese in mainland China, and Chinese vs. Japanese comparisons. Euro-Canadians can be further dissected into multiple ethnocultural groups, such as Italian-Canadians, French-Canadians, Polish-Canadians, etc. Recent investigations suggest that the independent cultural ethos in the United States varies from region to region and affects people's perceptions on well-being (Kitayama et al., 2010; Plaut et al., 2012). Similarly, Talhelm et al. (2014) propose that there are considerable variations of the interdependent cultural ethos within mainland China based on agricultural history of farming rice vs. wheat. Whether or not to combine or separate certain cultural groups (Euro-Canadians vs. Italian-Canadians or Asians vs. Chinese) in analysis will continue to be debated because this is indeed the fundamental question most cultural and cross cultural researchers often ask ourselves: How deep does "*culture matter*"?

Another limitation of the current dissertation is the dyadic design in *Manuscript 2*. The dyadic design in the last study is well suited for examining social support seeking and provision. However, dyadic friendships are also nested in larger social networks (Hinde, 1987). When only one friend is accounted for in the analysis, the effect we observed may be indeed the friendship effect. But it may also be possible that the effect is emerging from the social group (e.g., a clique) to which both members of the friendship dyad belong (Rubin et al., 2006). Recently, Kenny and Garcia (2012) proposed an initial step to analyze Actor-Partner Interdependence Model within small groups. The analytical progress in Actor-Partner Interdependence Model will certainly carry this line of research forward to better distinguish friendship effects from social group effects.

The discussion of the two conceptual and methodological frameworks (i.e., the Two/Three Cultural Contexts Comparison and Levels of Social Complexity) used in this dissertation was separate, however, they are not mutually exclusive and can complement each other. *Manuscript 2* can in fact benefit from a Three Cultural Contexts Comparison with special attention to local sociocultural contexts as discussed in *Manuscript 1*. Using the framework proposed by Hinde (1987, 1997), researchers could seek to integrate different levels of analysis, including the interaction, relationship, and group effects on the development and manifestation of social anxiety and OTKS, with emphasis on cultural variations in each level. In sum, this dissertation could contribute as an example to bridge conceptual, methodological and analytical approaches together in promoting cultural/cross cultural research.

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Table 1
Internal Consistency Across All Scales - Cronbach's Alpha in Study 1

Scale	Items	Euro-Canadians ($n = 267$)			Chinese ($n = 109$)		
Ind SC	15	.71	(5.06,	.62)	.77	(4.69,	.67)
Inter SC	15	.72	(4.54,	.63)	.82	(4.74,	.68)
IUS	27	.91	(1.67,	.46)	.95	(2.39,	.75)
SIAS	20	.87	(.80,	.48)	.90	(1.35,	.61)
OTKSQ	20	.89	(1.26,	.29)	.94	(1.98,	.60)

Note. Means and standard deviations are in parentheses. Ind SC is Independent Self-Construal, Inter SC is Interdependent Self-Construal, IUS is Intolerance of Uncertainty Scale, SIAS is Social Interaction Anxiety Scale, OTKSQ is Offensive-type Taijin Kyofusho Questionnaire.

Table 2
Correlations Among Variables in Study 1

Variables	1	2	3	4	5
1. Independent Self-Construal	–	.10	-.15*	-.32**	-.07
2. Interdependent Self-Construal	.50**	–	.13*	.16**	.20**
3. Intolerance of Uncertainty Scale	-.05	.13	–	.43**	.38**
4. Social Interaction Anxiety Scale	-.37**	-.23**	.52**	–	.35**
5. Offensive-Type TKS Questionnaire	-.08	.04	.27**	.35**	–

Note. *$p < .05$; **$p < .01$. Upper diagonal contains coefficients for Euro-Canadian participants, and lower diagonal for Chinese migrants.

Table 3
Correlations Among Variables in Study 2

	1	2	3	4	5
Euro-Canadians					
1. Independent Self-Construal	–	.09	-.27**	-.52**	-.35**
2. Interdependent Self-Construal		–	.24**	.19**	.25**
3. Intolerance of Uncertainty Scale			–	.63**	.48**
4. Social Interaction Anxiety Scale				–	.49**
5. Offensive-Type TKS Questionnaire					–
Chinese					
1. Independent Self-Construal	–	.69**	-.03	-.14	-.05
2. Interdependent Self-Construal		–	-.05	-.10	.15
3. Intolerance of Uncertainty Scale			–	.33**	.16
4. Social Interaction Anxiety Scale				–	.32**
5. Offensive-Type TKS Questionnaire					–
Japanese					
1. Independent Self-Construal	–	.10	-.10	-.37**	-.11
2. Interdependent Self-Construal		–	.23**	.21**	.34**
3. Intolerance of Uncertainty Scale			–	.48**	.28**
4. Social Interaction Anxiety Scale				–	.46**
5. Offensive-Type TKS Questionnaire					–

Note. $^{**}p < .01$.

Table 4
Internal Consistency Across All Scales - Cronbach's Alpha in Study 2

Scale	Items	Euro-Canadians ($n = 198$)			Chinese ($n = 127$)			Japanese ($n = 124$)		
Ind SC	15	.77	(4.83,	.68)	.80	(4.61,	.76)	.73	(4.54,	.69)
Inter SC	15	.68	(4.69,	.59)	.83	(5.03,	.73)	.71	(4.58,	.64)
IUS	27	.96	(2.27,	.84)	.88	(2.37,	.55)	.93	(2.91,	.72)
SIAS	20	.95	(1.41,	.87)	.88	(1.21,	.52)	.90	(1.79,	.74)
OTKSQ	20	.93	(2.07,	.63)	.90	(2.17,	.50)	.94	(2.30,	.70)

Note. Means and standard deviations are in parentheses. Ind SC is Independent Self-Construal, Inter SC is Interdependent Self-Construal, IUS is Intolerance of Uncertainty Scale, SIAS is Social Interaction Anxiety Scale, OTKSQ is Offensive-type Taijin Kyofusho Questionnaire.

Table 5
Descriptions of Additional Codes in Social Support Seeking and Social Support Provision Coding

Codes	Descriptions
Positive Affect (PA)	Laughing or Smiling
Task Related Behaviors (TR)	Behaviors that relate to the task at hand but were not intended to seek help nor to provide help Example: "I will draw a window right here."
Task Unrelated Behaviors (TU)	Behaviors that are off topic and completely unrelated to the task assigned Example: "Is there going to be a student strike next week?"
Rejection of Help (RSS)*	Behaviors that explicitly reject support from the friend and often companied by negative emotions Example: "Just shut up!"
Uncodable (UC)	Behaviors that do not fit any other codes or when the participant's speech is inaudible

*Note.**RSS only applies to the Social Support Seeking coding.

Table 6
Means and Standard Deviations for all Variables in the Etch-A-Sketch and Webcam Tasks

	Etch-A-Sketch				Webcam			
Variables	*M1*	*SD1*	*M2*	*SD2*	*M1*	*SD1*	*M2*	*SD2*
1. IDSS	14.60	9.77	27.65	14.90	5.02	5.17	3.17	3.11
2. DSS	12.91	12.77	8.31	4.6	7.63	6.63	1.83	2.24
3. Support	49.74	35.27	43.5	23.58	33.18	18.90	40.36	24.75
4. NB	2.64	3.84	5.56	9.80	1.61	2.93	1.00	1.47
5. NRISPT	2.62	0.76	2.82	1.13	2.62	0.76	2.82	1.13
6. NRINIT	1.39	0.47	1.18	0.32	1.39	0.47	1.18	0.32
7. NRISPF	2.80	0.91	2.94	1.10	2.80	0.91	2.94	1.10
8. NRINIF	1.29	0.33	1.07	0.13	1.29	0.33	1.07	0.13

Note. M1 and *SD1* presented means and *SD* for Chinese participants while *M2* and *SD2* presented means and *SD* for Euro-Canadian participants. NRISPT = Target's supportive interaction assessed in NRI; NRINIT = Target's negative interaction assessed in NRI; NRISPF = Friend's supportive interaction assessed in NRI; NRINIF = Friend's negative interaction assessed in NRI.

Table 7
Correlations for all Variables in the Etch-A-Sketch Task

Variables	1	2	3	4	5	6	7	8
1. IDSS		.49**	.43**	.26*	.05	−.09	.16	−.01
2. DSS	.46**		.77**	.08	.07	−.01	.16	−.14
3. Support	.38**	.59**		.25*	.12	−.03	.16	−.04
4. NB	.17	.47**	.47**		.15	.20	−.01	.15
5. NRISPT	.12	.17	.25	.03		.42**	.36**	.22
6. NRINIT	−.13	−.14	−.01	−.06	.18		.05	.14
7. NRISPF	.06	.30*	.31*	.19	.85**	.08		.22
8. NRINIF	−.09	−.25	.05	.05	.02	.17	−.07	

Note. Upper diagonal presents correlation coefficients for Chinese participants while the lower diagonal presents correlation coefficients for Euro-Canadians participants. NRISPT = Target's supportive interaction assessed in NRI; NRINIT = Target's negative interaction assessed in NRI; NRISPF = Friend's supportive interaction assessed in NRI; NRINIF = Friend's negative interaction assessed in NRI.

Table 8
Gender Variations in Social Support Seeking and Provision Behaviors by Cultural Contexts

Variables	Estimate	95% CI	Wald $\chi^2(1)$	$M(SD)$
Etch-A-Sketch Task				
Chinese				
IDSS	0.38	[−0.12, 0.88]	2.24	14.60(9.77)
DSS	0.74	[0.23, 1.25]	8.18**	12.91(12.77)
Support	0.48	[−0.01, 0.96]	3.63	49.74(35.27)
NB	0.26	[−0.31, 0.83]	0.81	2.65(3.84)
Total	0.52	[0.04, 1.00]	4.45*	143.62(79.89)
Euro-Canadians				
IDSS	0.27	[−0.40, 0.94]	0.63	27.65(14.90)
DSS	0.16	[−0.53, 0.86]	0.21	8.31(4.68)
Support	0.08	[−0.58, 0.74]	0.05	43.50(23.58)
NB	0.70	[−0.04, 1.44]	3.43	5.56(9.80)
Total	0.31	[−0.35, 0.96]	0.83	232.48(92.64)
Webcam Task				
Chinese				
IDSS	0.22	[−0.34, 0.83]	0.68	5.02(5.17)
DSS	0.14	[−0.43, 0.70]	0.22	7.63(6.63)
Support	0.001	[−0.54, 0.54]	.00	33.18(18.90)
NB	0.56	[−0.14, 1.26]	2.49	1.61(2.93)
Total	0.22	[−0.31, 0.75]	0.64	112.75(53.76)
Euro-Canadians				
IDSS	0.42	[−0.44, 1.28]	0.91	3.17(3.12)
DSS	0.10	[−0.81, 1.02]	0.05	1.83(2.24)
Support	0.82	[0.07, 1.56]	4.64*	40.36(24.75)
NB	1.32	[−0.08, 2.72]	3.41	1.00(1.47)
Total	1.44	[0.05, 2.83]	4.14*	139.22(59.75)

Note. *$p < .05$, **$p < .01$, ***$p < .001$. Female was coded as 1 and male was coded as 0. Total = total number of interactions within the dyad.

Table 9
APIM Model Effects in Etch-A-Sketch and Webcam Tasks

Effects	Estimate	95% CI	Wald $\chi^2(1)$	Marginal R^2 †
Etch-A-Sketch Task				
Outcome: DSS with Supportive Responses in Model 2:				0.45
Target X NRISP-Actor	0.04	[−0.19, 0.27]	0.11	
Target X NRISP-Partner	0.05	[−0.17, 0.26]	0.16	
Friend X NRISP-Actor	−0.02	[−0.21, 0.16]	0.05	
Friend X NRISP-Partner	0.04	[−0.17, 0.26]	0.16	
Target X NRISP-Actor X Gender	−0.19	[−0.42, 0.04]	2.69	
Target X NRISP-Partner X Gender	0.16	[−0.06, 0.39]	2.09	
Friend X NRISP-Actor X Gender	0.21	[0.03, 0.39]	5.14*	
Friend X NRISP-Partner X Gender	−0.10	[−0.32, 0.12]	0.85	
Outcome: IDSS with Negative Responses in Model 1:				0.49
Target X NRINI-Actor	−0.21	[−0.50, 0.08]	2.08	
Target X NRINI-Partner	0.21	[−0.49, 0.91]	0.35	
Friend X NRINI-Actor	0.50	[−1.04, 2.05]	0.41	
Friend X NRINI-Partner	−0.14	[−0.63, 0.36]	0.29	
Target X NRINI-Actor X Culture	0.10	[−0.19, 0.39]	0.48	
Target X NRINI-Partner X Culture	−0.21	[−0.91, 0.50]	0.33	
Friend X NRINI-Actor X Culture	0.13	[−1.48, 1.74]	0.02	
Friend X NRINI-Partner X Culture	0.60	[0.10, 1.10]	5.48*	
Webcam Task				
Outcome: DSS with Supportive Responses in Model 2:				0.58
Target X NRISP-Actor	0.06	[−0.28, 0.41]	0.13	
Target X NRISP-Partner	0.15	[−0.16, 0.46]	0.86	
Friend X NRISP-Actor	0.21	[0.07, 0.35]	8.21**	
Friend X NRISP-Partner	0.13	[−0.01, 0.28]	3.12	
Target X NRISP-Actor X Gender	−0.43	[−0.76, −0.11]	6.81**	
Target X NRISP-Partner X Gender	0.08	[−0.24, 0.41]	0.26	
Friend X NRISP-Actor X Gender	0.10	[−0.04, 0.24]	1.97	
Friend X NRISP-Partner X Gender	−0.25	[−0.41, −0.10]	10.61**	
Outcome: IDSS with Negative Responses in Model 2:				0.59
Target X NRINI-Actor	0.57	[0.04, 1.09]	4.46*	
Target X NRINI-Partner	−0.47	[−1.02, 0.08]	2.77	
Friend X NRINI-Actor	−0.27	[−1.31, 0.77]	0.26	
Friend X NRINI-Partner	0.83	[0.09, 1.56]	4.89*	
Target X NRINI-Actor X Gender	−0.57	[−1.09, −0.05]	4.60*	
Target X NRINI-Partner X Gender	0.16	[−0.41, 0.74]	0.31	
Friend X NRINI-Actor X Gender	−0.49	[−1.63, 0.64]	0.72	
Friend X NRINI-Partner X Gender	0.09	[−0.58, 0.76]	0.07	

Note. *$p < .05$, **$p < .01$. † Marginal R^2 can be interpreted as the proportion of variance explained by the fitted model (Hardin & Hilbe, 2003). DSS = Direct Support Seeking; IDSS = Indirect Support Seeking.

Table 10
Correlations for all Variables in the Webcam Task

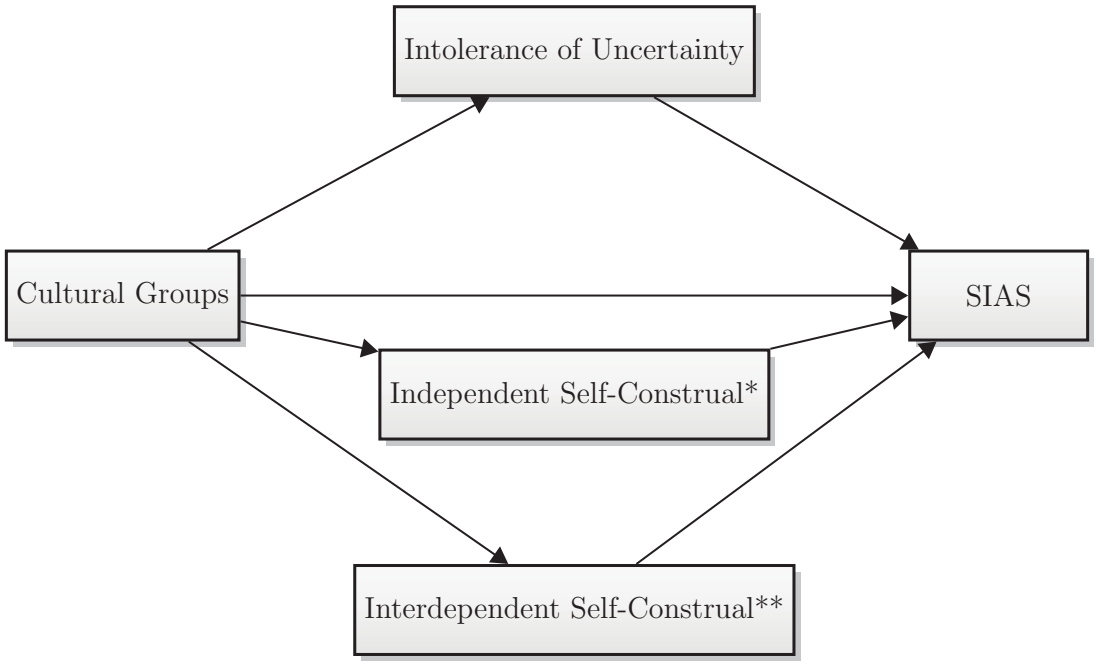
Variables	1	2	3	4	5	6	7	8
1. IDSS		.38**	.30*	−.12	.06	.05	−.03	−.24
2. DSS	.59**		.47**	.19	.16	.09	.31*	−.04
3. Support	.26	.16		−.07	.02	.07	.18	.06
4. NB	.20	.49**	.18		.00	.28*	−.14	−.11
5. NRISPT	.10	−.01	.51**	.07		.42**	.36**	.22
6. NRINIT	−.01	.38*	−.02	.48**	.18		.05	.14
7. NRISPF	.21	.16	.63**	.08	.85**	.08		.22
8. NRINIF	.11	.00	−.06	.03	.02	.17	−.07	

Note. Upper diagonal presents correlation coefficients for Chinese participants while the lower diagonal presents correlation coefficients for Euro-Canadians participants. NRISPT = Target's supportive interaction assessed in NRI; NRINIT = Target's negative interaction assessed in NRI; NRISPF = Friend's supportive interaction assessed in NRI; NRINIF = Friend's negative interaction assessed in NRI.

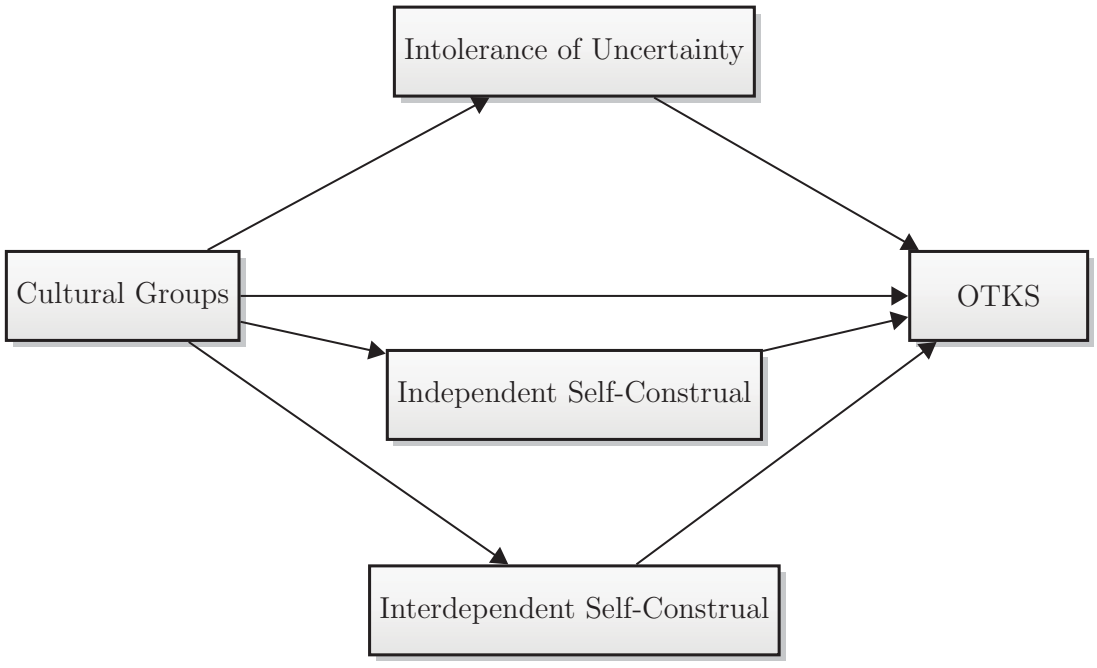
Table 11
APIM Model Effects in Cross Task Examination

Effects	Estimate	95% CI	Wald $\chi^2(1)$	Marginal R^2 †
Outcome: DSS with Supportive Responses in Model 1:				0.24
Target X DSS-Actor	0.02	[−0.03, 0.07]	0.67	
Target X DSS-Partner	−0.004	[−0.01, 0.004]	0.78	
Friend X Support-Actor	0.01	[0.003, 0.01]	9.45**	
Friend X Support-Partner	0.03	[0.005, 0.05]	5.80*	
Target X DSS-Actor X Culture	0.01	[−0.04, 0.06]	0.15	
Target X DSS-Partner X Culture	−0.004	[−0.01, 0.004]	0.99	
Friend X Support-Actor X Culture	−0.01	[−0.01, −0.003]	9.25**	
Friend X Support-Partner X Culture	−0.02	[−0.05, −0.001]	4.17*	
Outcome: DSS with Supportive Responses in Model 2:				0.62
Target X DSS-Actor	0.05	[0.02, 0.08]	11.93***	
Target X DSS-Partner	−0.01	[−0.03, 0.0005]	3.56	
Friend X Support-Actor	0.002	[−0.004, 0.01]	0.43	
Friend X Support-Partner	0.01	[−0.005, 0.03]	1.90	
Target X DSS-Actor X Gender	−0.02	[−0.05, 0.02]	0.94	
Target X DSS-Partner X Gender	0.005	[−0.01, 0.02]	0.74	
Friend X Support-Actor X Gender	0.01	[0.003, 0.02]	7.76**	
Friend X Support-Partner X Gender	−0.03	[−0.04, −0.01]	11.07***	
Outcome: IDSS with Negative Responses in Model 1:				0.39
Target X IDSS-Actor	0.01	[−0.01, 0.03]	1.17	
Target X IDSS-Partner	−0.04	[−0.07, −0.01]	6.99**	
Friend X NB-Actor	0.09	[0.04, 0.14]	11.99***	
Friend X NB-Partner	−0.01	[−0.04, 0.02]	0.63	
Target X IDSS-Actor X Culture	0.01	[−0.01, 0.03]	1.80	
Target X IDSS-Partner X Culture	−0.07	[−0.10, −0.04]	18.15***	
Friend X NB-Actor X Culture	0.06	[0.01, 0.11]	6.38*	
Friend X NB-Partner X Culture	−0.02	[−0.04, 0.01]	2.17	
Outcome: IDSS with Negative Responses in Model 2:				0.31
Target X IDSS-Actor	0.01	[−0.02, 0.03]	0.39	
Target X IDSS-Partner	−0.09	[−0.16, −0.03]	7.58**	
Friend X NB-Actor	0.03	[−0.04, 0.10]	0.83	
Friend X NB-Partner	−0.04	[−0.08, 0.0003]	3.78	
Target X IDSS-Actor X Gender	−0.01	[−0.03, 0.01]	0.89	
Target X IDSS-Partner X Gender	0.10	[0.03, 0.17]	8.70**	
Friend X NB-Actor X Gender	0.02	[−0.05, 0.09]	0.35	
Friend X NB-Partner X Gender	0.02	[−0.01, 0.05]	1.90	

Note. *$p < .05$, **$p < .01$, ***$p < .001$. † Marginal R^2 can be interpreted as the proportion of variance explained by the fitted model (Hardin & Hilbe, 2003). DSS = Direct Support Seeking; IDSS = Indirect Support Seeking.

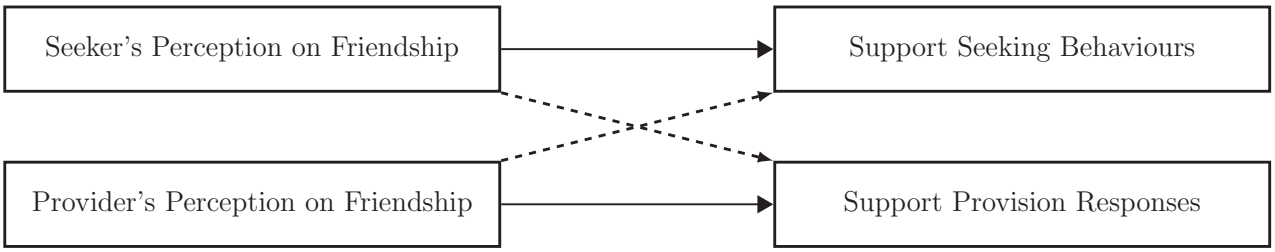


(a) Panel A: Multiple Mediation Model for SIAS

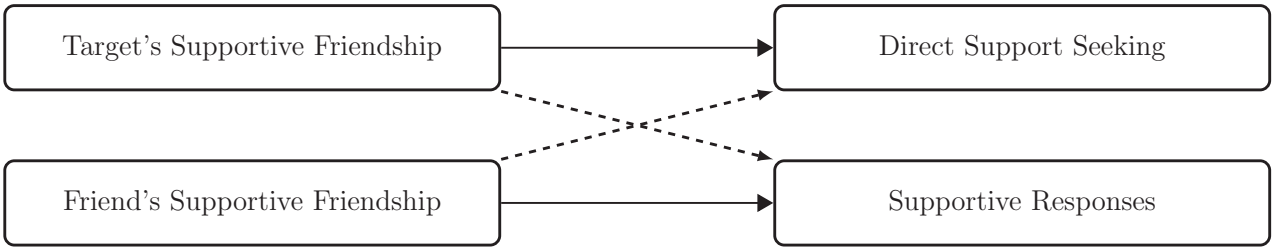


(b) Panel B: Multiple Mediation Model for OTKS

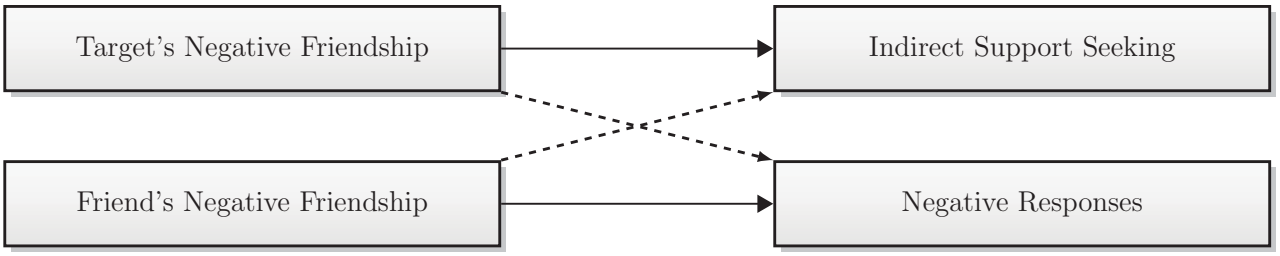
Figure 1. Mediation Models in Study 1 and 2. *Only Independent Self-construal and Intolerance of Uncertainty were entered in Study 1 for SIAS. **Only Interdependent Self-construal and Intolerance of Uncertainty were entered in Study 2 for SIAS.



(a) Standard Actor-Partner Interdependence Model.

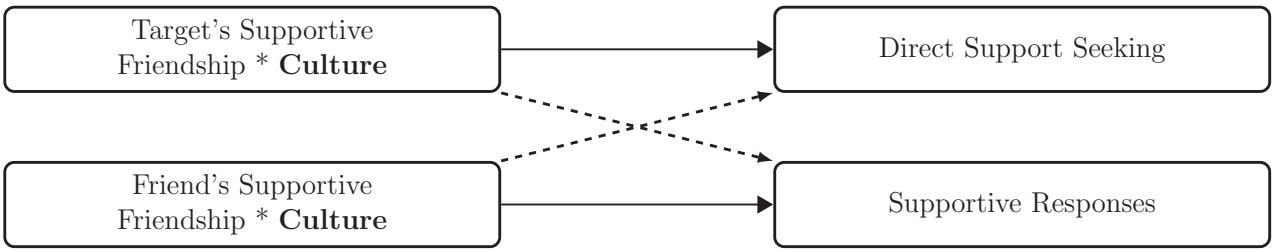


(b) Actor-Partner Interdependence Model for supportive friendship in predicting direct support seeking and supportive support responses. Target is the support seeker and Friend is the support provider.

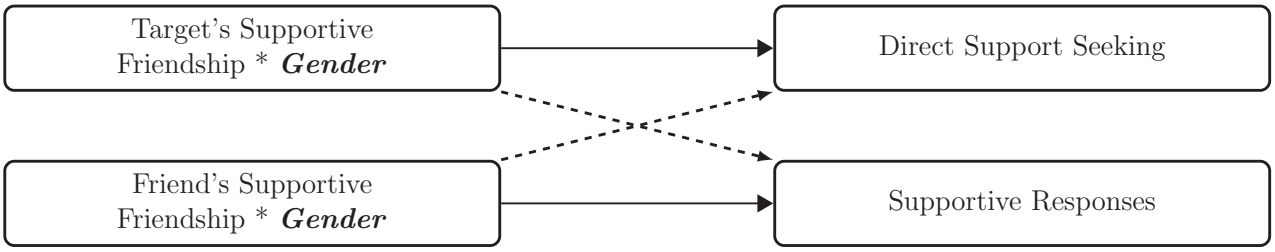


(c) Actor-Partner Interdependence Model for negative friendship in predicting indirect support seeking and negative support responses. Target is the support seeker and Friend is the support provider.

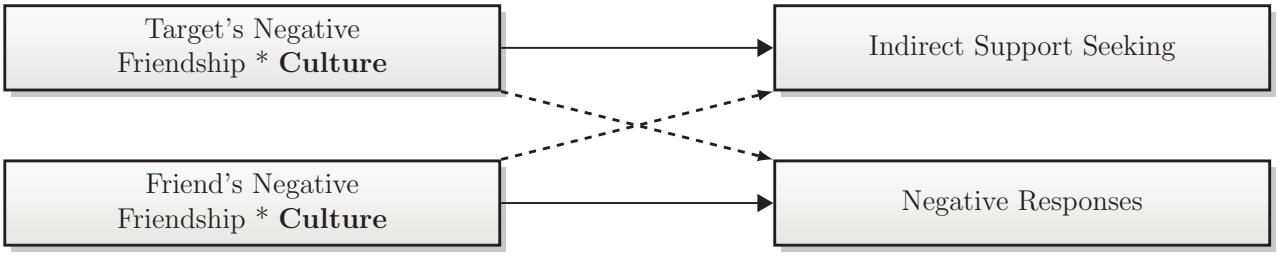
Figure 2. Actor-Partner Interdependence Models.



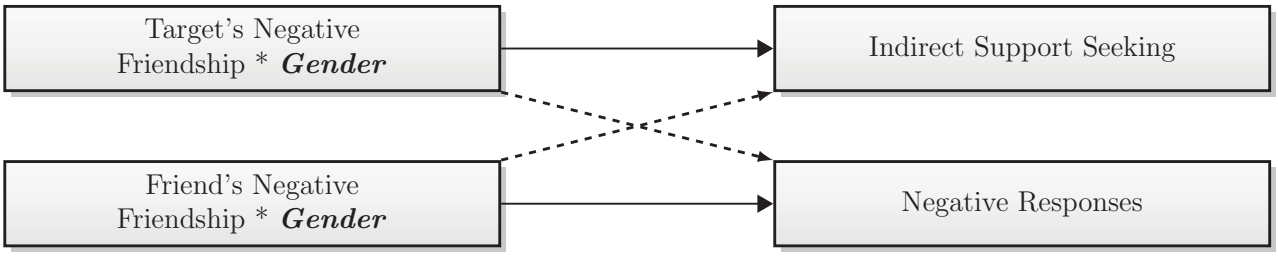
(a) Actor-Partner Interdependence Model 1 for direct support seeking and supportive responses using culture as the moderator.



(b) Actor-Partner Interdependence Model 2 for direct support seeking and supportive responses using gender as the moderator.



(c) Actor-Partner Interdependence Model 1 for indirect support seeking and negative responses using culture as the moderator.



(d) Actor-Partner Interdependence Model 2 for indirect support seeking and negative responses using gender as the moderator.

Figure 3. Actor-Partner Interdependence Models with three-way interactions: Target is the support seeker while Friend is the support provider.

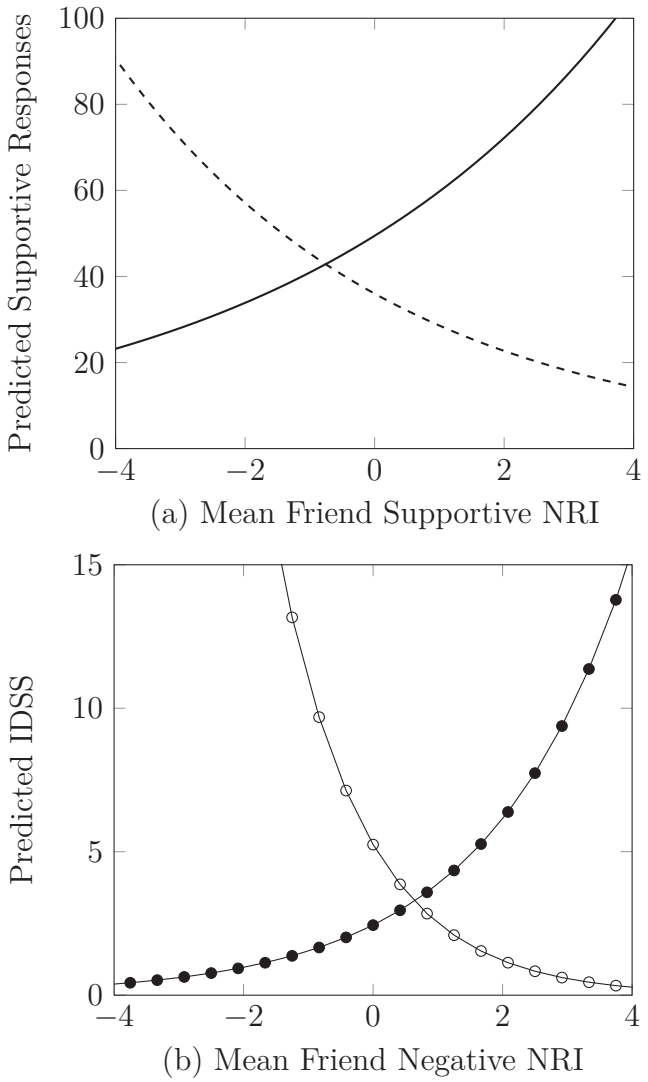


Figure 4. (a) Gender variations in the actor effect of supportive NRI among support providers (Females ——, Males - - -) and (b) Cultural variations in the partner effect of negative NRI among support providers during Etch-A-Sketch Task (Chinese —●—, Euro-Canadians —○—).

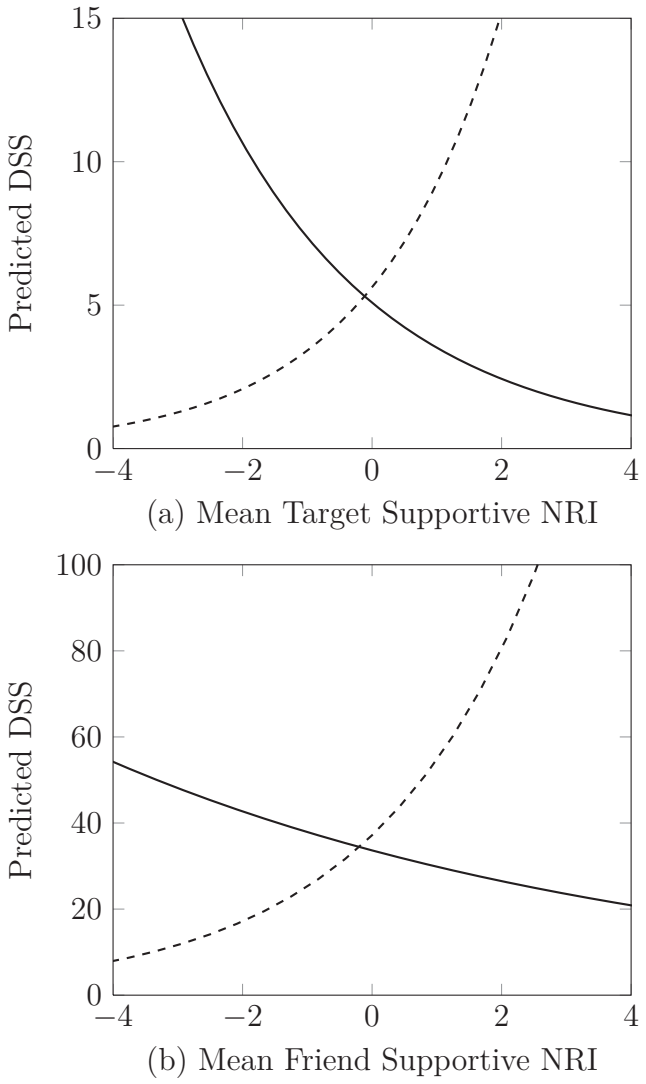


Figure 5. Gender variations in (a) actor effect of supportive NRI among support seekers and (b) partner effect of supportive NRI among support providers during Webcam task (Females ——, Males - - - -).

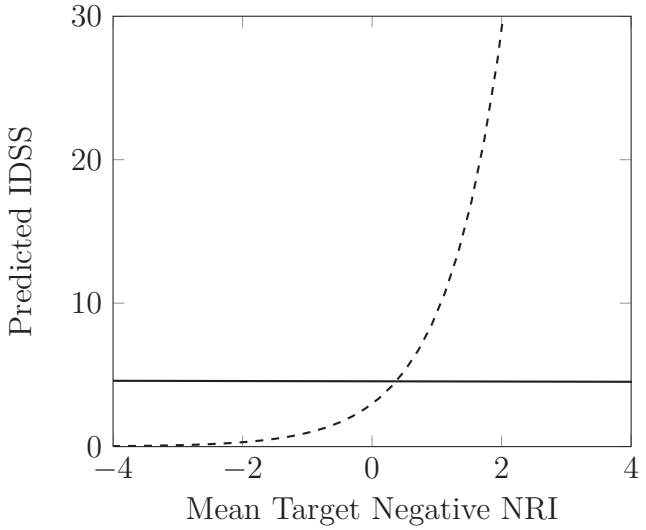
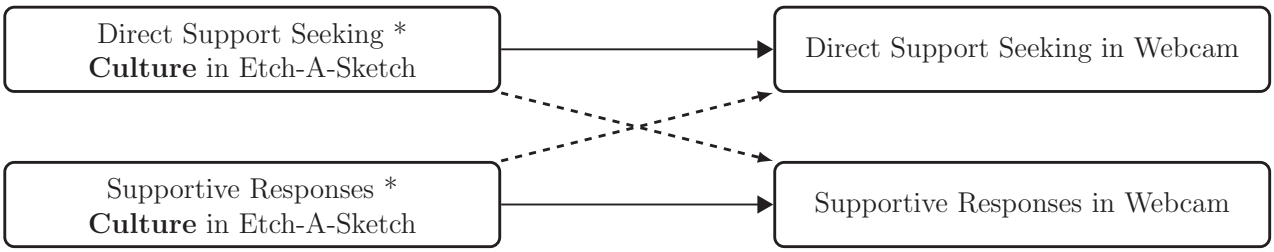
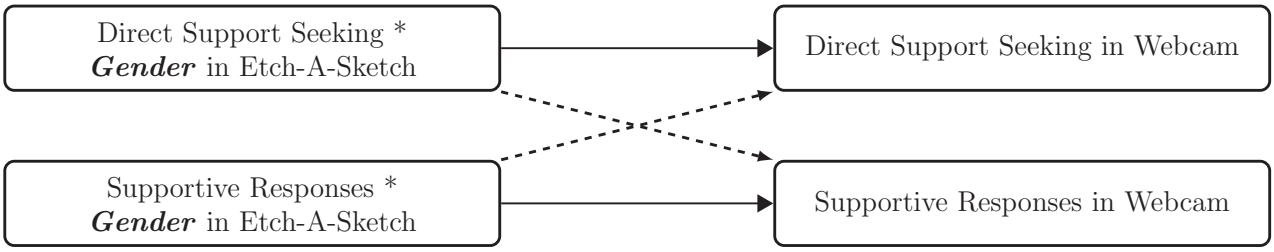


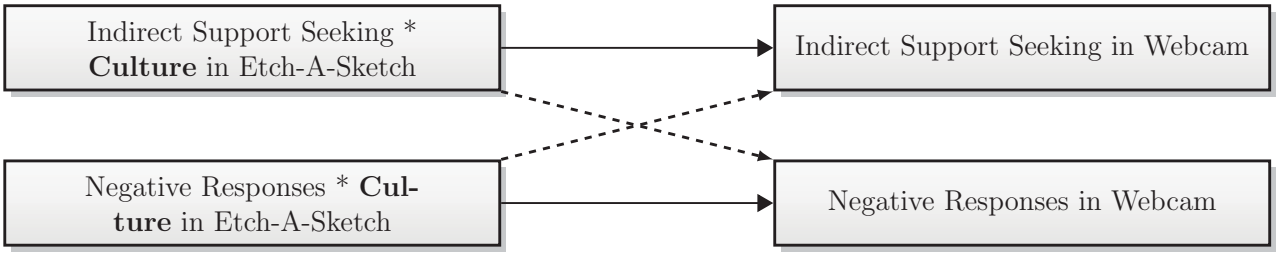
Figure 6. Gender variations in the actor effect of negative NRI among support providers during Webcam task (Females ——, Males - - - -).



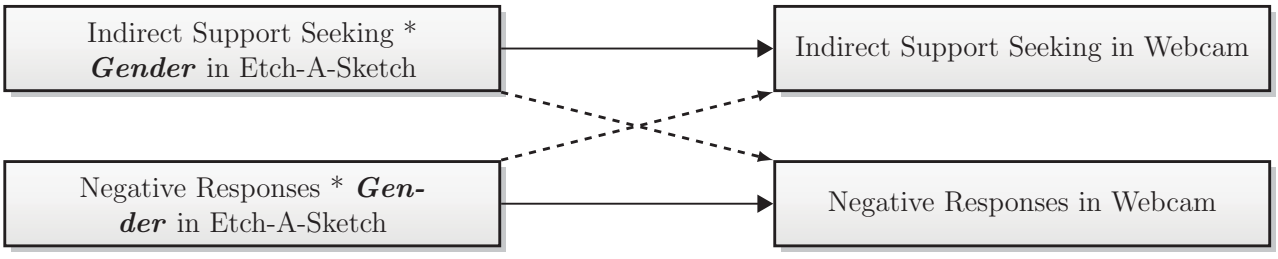
(a) Actor-Partner Interdependence Model 1 for direct support seeking and supportive responses using culture as the moderator for cross task examination.



(b) Actor-Partner Interdependence Model 2 for direct support seeking and supportive responses using gender as the moderator for cross task examination.



(c) Actor-Partner Interdependence Model 1 for indirect support seeking and negative responses using culture as the moderator for cross task examination.



(d) Actor-Partner Interdependence Model 2 for indirect support seeking and negative responses using gender as the moderator for cross task examination.

Figure 7. Actor-Partner Interdependence Models with three-way interactions for cross task examination.

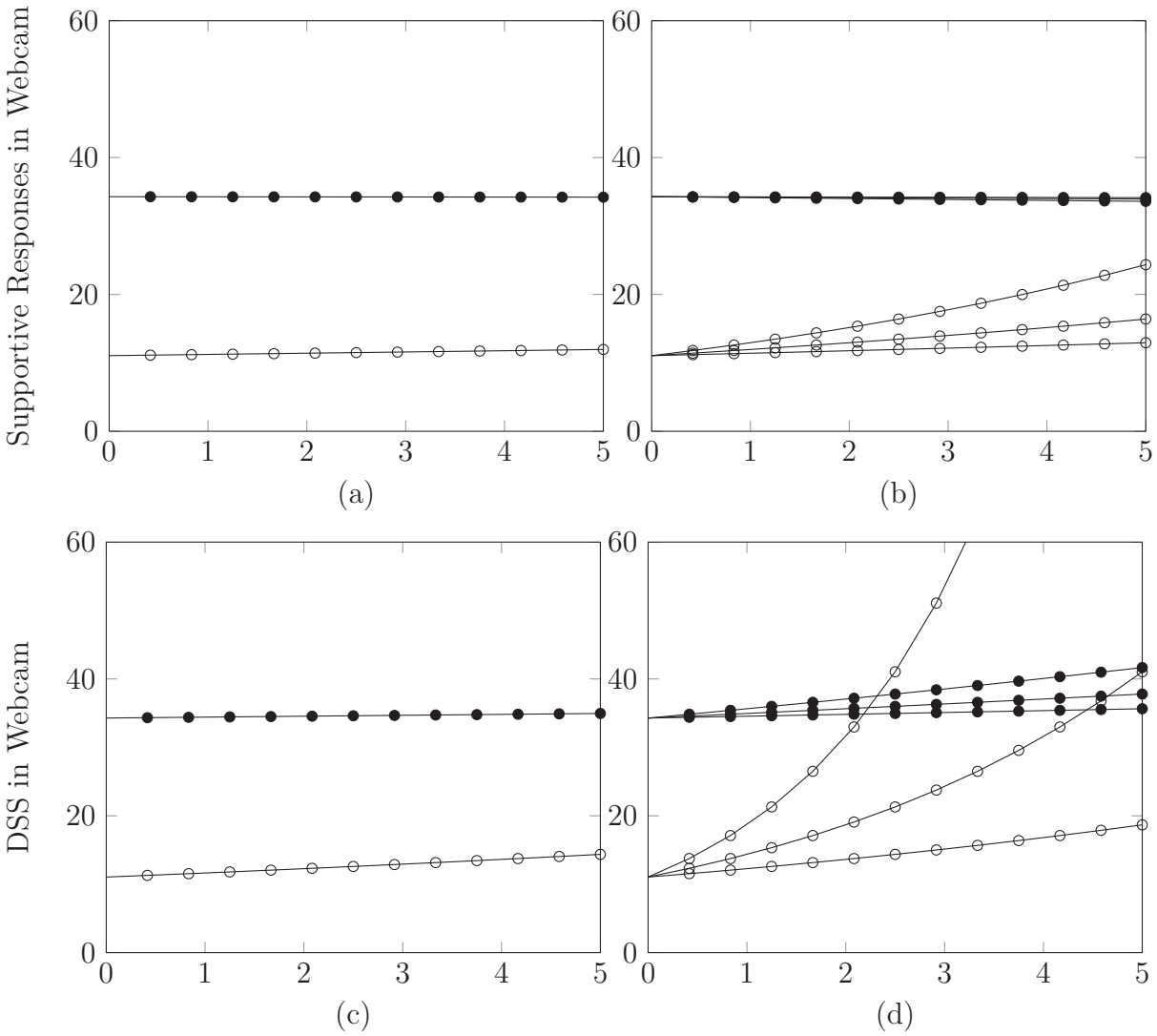


Figure 8. Cultural variations in cross task examination using supportive responses during Etch-A-Sketch task to predict DSS and supportive responses in Webcam task. Figures (b) and (d) were based on increments of 2, 5 and 10 units in order to provide better illustrations of the interactions (Chinese —●—, Euro-Canadians —○—).

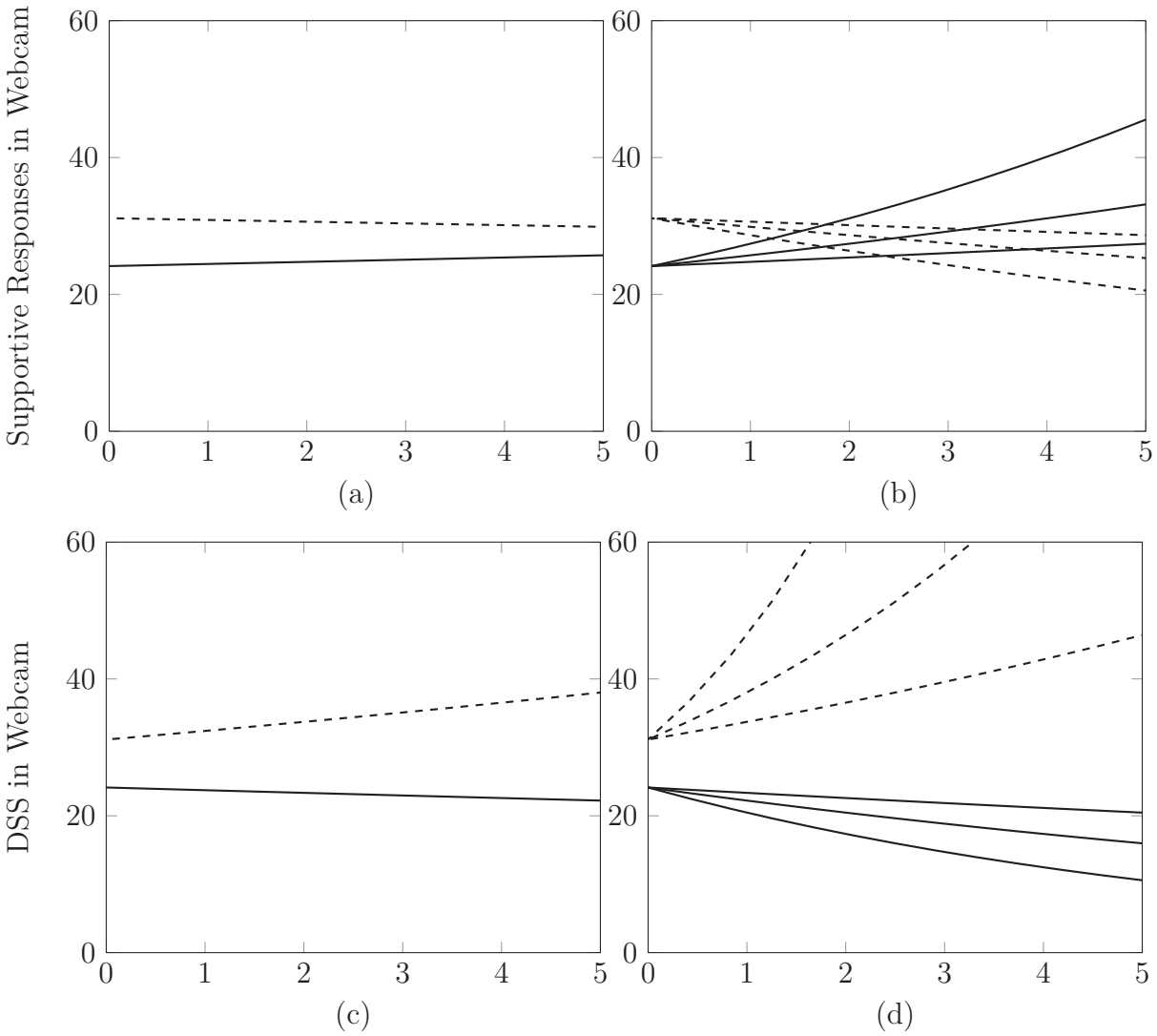


Figure 9. Gender variations in cross task examination using supportive responses during Etch-A-Sketch Task to predict DSS and supportive responses in Webcam Task. Figures (c) and (d) were based on increments of 2, 5 and 10 units in order to provide better illustrations of the interactions (Females ——, Males - - - -).

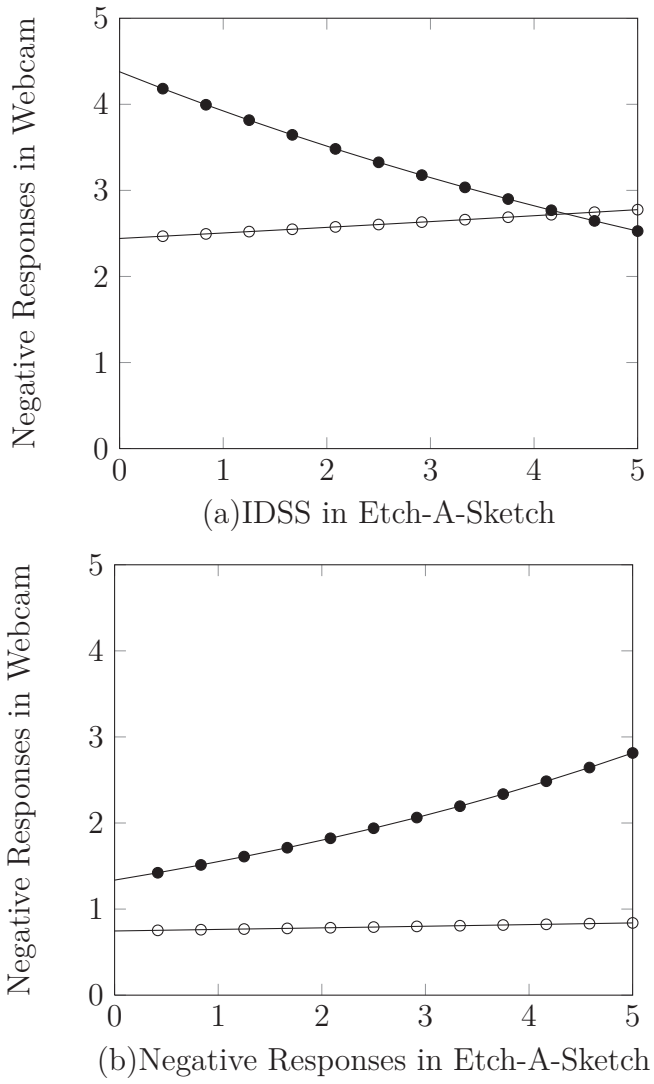


Figure 10. Cultural variations in cross task examination regarding IDSS and negative responses (Chinese —●—, Euro-Canadians —○—).

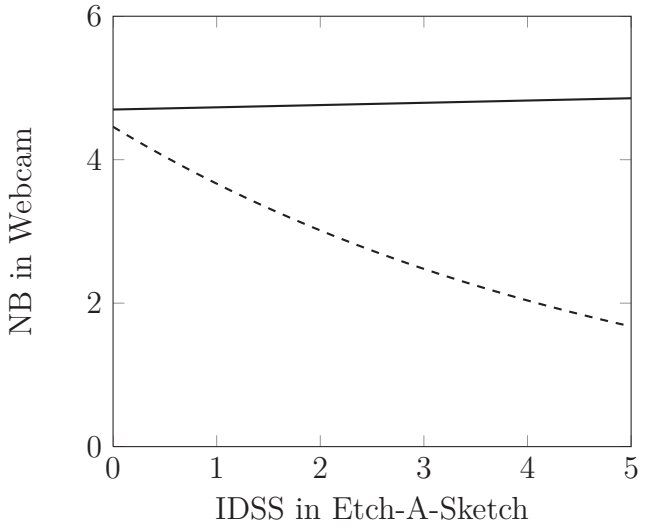


Figure 11. Gender variations in cross task examination regarding IDSS and negative responses (Females ——, Males - - - -).