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# Sibling Acculturation Discrepancy, Sibling Relationship Quality and Adjustment among Vietnamese and Chinese Young Adults in Canada: A Mixed-Method Approach

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SIBLING ACCULTURATION DISCREPANCY,  
SIBLING RELATIONSHIP QUALITY AND ADJUSTMENT  
AMONG VIETNAMESE AND CHINESE YOUNG ADULTS IN CANADA:  
A MIXED-METHOD APPROACH

By  
Trang K. Le

A Dissertation  
Submitted to the Faculty of Graduate Studies  
through Psychology  
in Partial Fulfillment of the Requirements for  
the Degree of Doctor of Philosophy at the  
University of Windsor

Windsor, Ontario, Canada

2011

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## ABSTRACT

The present research represents an expansion of the acculturation gap-distress model by investigating the role of acculturation discrepancies in the adjustment of Vietnamese and Chinese young adults. A concurrent mixed-method nested, quantitative dominant design was employed. A comparison between actual and perceived sibling acculturation discrepancy was also examined as well as differences between Vietnamese and Chinese young adults on the key study variables. Thematic analysis of the qualitative data was conducted to further shed light on the quantitative findings.

Two samples were collected: the main data set comprised of 150 Vietnamese and Chinese young adults and the sibling pairs data set comprised of 18 pairs of siblings. Questionnaires on self-reported and perceived bilinear acculturation, sibling relationship quality, psychological adjustment, intercultural adjustment difficulties and demographic data were administered online. Qualitative data was collected using eight open-ended questions regarding sibling acculturation discrepancy and sibling relations.

Quantitative results showed that sibling acculturation discrepancy uncorrelated with psychological adjustment or intercultural adjustment difficulties. Further, sibling conflict moderated the relationship between perceived sibling heritage acculturation discrepancy and intercultural competence difficulties and predicted psychological adjustment. Analyses also revealed that siblings accurately perceived acculturation discrepancies. Further, actual and perceived acculturation discrepancy were both associated with psychological adjustment and intercultural competence difficulties. Finally, Chinese young adults were more likely to report higher heritage acculturation and sibling warmth than Vietnamese young adults.

Qualitative results revealed seven themes of which three were related to the quantitative results. First, siblings defined acculturation in both multi-factorial and bilinear terms. A multi-factorial and bilinear approach to acculturation measurement may have enhanced the present study. In addition, siblings were aware of differences in acculturation between themselves, but they employed many strategies to cope with perceived acculturation differences to help mitigate sibling conflict and distress. The association between sibling conflict and psychological adjustment found in this study may be related to the way siblings cope with acculturation differences.

This study expands upon the acculturation gap-distress model to include siblings as an important context within which to study immigrant adjustment and adaptation. The implications of its findings are discussed.

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## **CHAPTER I**

### **Introduction**

In recent years, there has been a marked increase in the numbers of immigrants arriving to Canada and the United States. Many of these immigrants originate from Asian countries. Statistics Canada (2006) reports that over 58% of the approximately 1.2 million immigrants accepted into Canada between 2001 and 2006 were from Asian countries (including Middle Eastern countries). Further, for the first time in 75 years the number of immigrants coming to Canada from Asian countries exceeded those coming from European countries (Statistics Canada, 2006) and this trend is expected to continue.

The self-identified Asian Canadian population is estimated to be 9.5% of the total Canadian population and it consists of 1,094,700 Chinese, 327,545 Filipino, 151,410 Vietnamese, 101,715 Korean, 85,225 Japanese, 74,015 Pakistani, 49,205 South Asian, and 18,080 Taiwanese individuals (Statistics Canada, 2006). In addition, there is a large Canadian population of 1.5<sup>th</sup> and 2<sup>nd</sup> generation Asian immigrants (Statistics Canada, 2001). That is, immigrants who are foreign-born and arrive in Canada before the age of 12 years and those who are born in Canada to foreign-born parents, respectively. As the Asian Canadian population continues to grow, there is an increasing need to better understand their immigrant experiences and how these experiences impact their mental health and adaptation outcomes.

Despite the growing population of children born to Asian immigrant parents, there remains a relative paucity of research focusing on this group's experiences of adaptation and adjustment. Further, the existing research tends to focus on children and adolescents, or immigrant adults rather than young adults. In addition, the majority of research on the children of immigrants tends to focus on the impact of intergenerational conflict or acculturation differences between parents and children on family conflict, parent adjustment or child adjustment. This line of research suggests that immigrant parents acculturate at a slower rate to the host culture than their children which results in conflict and tensions between parents and children, leading to adjustment problems for both (Portes & Rumbaut, 1996). However, research suggests that immigrants within the same generation acculturate at differing rates and follow a variety of acculturative paths (Portes

& Zhou, 1993; Rumbaut, 1994). This suggests that siblings within the same family may follow differing acculturative paths.

Mainstream sibling research suggests that sibling variables such as sibling relationship quality contribute to socio-emotional development and psychological adjustment across the lifespan (Cicirelli, 1991, 1995; Bank, Burraston, & Snyder, 2004; Modry-Mandell, Gamble, & Taylor, 2007). While most of what is known about Vietnamese and Chinese family structure comes from ethnographic descriptions rather than empirical research, these descriptions consistently highlight the importance of the sibling relationship in maintaining family harmony for these cultural groups (Forrest, 1982; Rutledge, 1992). Given the importance of siblings, particularly in Asian families, this dissertation focuses specifically on acculturation discrepancies between Vietnamese and Chinese young adult siblings.

In this study, it was hypothesized that acculturation discrepancies between Vietnamese and Chinese young adults siblings would be associated with their psychological adjustment and intercultural adjustment difficulties. Further, sibling relationship quality was hypothesized to moderate or mediate the relation between sibling acculturation discrepancies and adjustment for Vietnamese and Chinese young adults. In the present study, participant's adjustment was defined and assessed in terms of psychological adjustment and intercultural adjustment difficulties. Psychological adjustment was assessed with two measures of depression. Intercultural adjustment difficulties were assessed with a measure of cultural difficulties within both the host and heritage cultures. The latter adjustment variable has not been previously investigated in the context of acculturation discrepancy with immigrant siblings. In addition to these main hypotheses, it was also hypothesized that Vietnamese and Chinese young adults would differ on a variety of cultural and sibling variables, including acculturation, sibling acculturation discrepancy, sibling relationship quality, psychological adjustment and intercultural adjustment difficulties. While Vietnamese and Chinese cultures are based on Confucian principles, differing pre- and post-migration experiences of these two groups in Canada may be associated with differences in adaptation and family relationships (Phan, Rivera, & Roberts-Wilbur, 2005). As well, it was hypothesized that both actual and perceived sibling acculturation discrepancy would be differentially related to

psychological adjustment and intercultural adjustment difficulties. Qualitative data were also collected using eight open-ended questions and were analyzed to assist with the interpretation of the quantitative findings. A concurrent nested quantitative dominant mixed-method design was employed to investigate the research questions.

## **CHAPTER II**

### **Literature Review**

The following sections outline a review of the literature on acculturation discrepancy and adjustment. Accordingly, the review includes definition, theory and measurement of acculturation discrepancy and research on psychological adjustment and intercultural adjustment difficulties in immigrant populations. The overwhelming majority of research on acculturation discrepancy focuses on the parent-child relationship. As such, much of the literature review to follow is based on the parent-child research with studies on siblings provided when they are available. A review of sibling research is also presented and highlights the importance of siblings across the lifespan, the significance of siblings in Vietnamese and Chinese families, and the association between sibling relationship quality and socio-emotional and psychological outcomes.

#### **Acculturation Discrepancy**

##### **Definition and Theory**

Acculturation is the process of cultural change that occurs when individuals or groups from different cultures come into contact with one another (Graves, 1967; Redfield, Linton, & Herskovits, 1936). Acculturation occurs at the group and individual level as well as within the mainstream culture and culture of origin. At the individual level, changes include alterations in the use of language, thinking patterns, personality, identity, and attitudes. Researchers have noted differences in the rates of acculturation among immigrant parents and their children across different ethnic groups (Kwak, 2003; Merali, 2002; Portes & Rumbaut, 1996). Over the years, a variety of terms have been used to characterize this phenomenon including “acculturative dissonance” (Rumbaut & Portes, 2002), “acculturation discrepancy” (Crane, Ngai, Larson, & Hafen, 2005), “intergenerational acculturation discrepancies” (Atzaba-Poria & Pike, 2007), “acculturation disparities” (Tardif & Geva, 2006), “acculturation gap” (Lee, Choe, Kim & Ngo, 2000; Teoh, 1974). Acculturation discrepancies between immigrant parents and children have been found to be associated with family conflict and youth maladjustment (Lam, 2005; Lee et al., 2000; Portes & Rumbaut, 1996; Ying & Han, 2007). The acculturation gap-distress model was posited to explain the relation between these three

variables wherein acculturation discrepancies between immigrant parents and their children leads to or exacerbates intergenerational conflict or family conflict which, in turn, results in maladjustment (Lau et al., 2005; Portes & Rumbaut, 1996; Szapocznik & Kurtines, 1993). An underlying assumption of this model is that parents acculturate to the host culture at a much slower rate than their children who acculturate to the host culture and lose their heritage culture at a much faster rate (Szapocznik et al., 1978). This model does not account for situations where immigrant children or children of immigrants may retain more of their heritage culture than their parents.

Further, this model assumes that immigrant children and the children of immigrants acculturate at a similar rate to each other. Segmented assimilation theory, based on the unilinear acculturation perspective, posits that the children of immigrants (both 1.5 and second generation) assimilate into different segments of the U.S. culture. This theory has been supported by previous research and a number of factors contributing to outcomes have been identified including parent's socioeconomic status, family structure, child-rearing practices, gender and legal status (Stepick & Stepick, 2010). This suggests that the children of immigrants acculturate to the host culture at differing rates from each other. Based on this literature, siblings are hypothesized in the present study to acculturate at differing rates and the difference in acculturation between siblings is associated with psychological and intercultural outcomes.

In addition, the acculturation gap-distress model only accounts for unilinear acculturation gaps where acculturation to the host culture necessitates a rejection or loss of the heritage culture. Bilinear models of acculturation suggest that immigrants undergo cultural changes within both the host culture and the culture of origin whereby individuals selectively change across various cultural domains such as cultural activities, food, clothing, music preferences, religious practices, and language use (Berry, 1997; Berry, Kim, Power, et al., 1989; Laroche, Kim, Hui & Joy, 1996). Indeed, researchers examining acculturation within Hispanic/Mexican populations have noted that acculturating individuals are able to participate in and understand the social behaviours and activities of the host culture, while at the same time maintain their ethnic identity without experiencing conflict (Ramirez, 1984; Rogler, Cortes & Malgady, 1991). Thus, a

bilinear model of acculturation discrepancy was employed in the present study with Vietnamese and Chinese siblings.

An important consideration in acculturation discrepancy research is how the concept is measured. The following is a review of three main methods utilized in previous parent-child acculturation discrepancy research to calculate acculturation discrepancy.

### **Measurement of Acculturation Discrepancy**

There are three main methods that have been used to measure acculturation discrepancy: categorization or match/mismatch, interaction, and subtraction or difference score (see Table 1). The *categorization* method is based on the bilinear acculturation model, where family members are categorized as matched or mismatched on self-reported acculturation strategy (assimilation, integration, marginalization and separation). The mismatch in acculturation strategy is then categorized as benign (child is integrated or separated while the parent is assimilated), problematic (child is assimilated or integrated and parent is separated) or high risk (when either child or parent is marginalized) (Lau, McCabe, Yeh, Garland, Wood et al., 2005). This method allows researchers to isolate acculturation discrepancy as an independent variable. However, this method does not take into account the different combinations of parent-child acculturation discrepancy that have been noted in the literature to be related to differential outcomes. For example, Atzaba-Poria and Pike (2007) compared 31 Indian adolescents with 37 English adolescents and found that within the Indian sample, adolescents experienced more internalizing problems when their parents were more acculturated to the Western culture or were less heritage acculturated than themselves. They also found that Indian adolescents exhibited more externalizing problems when their mothers were more acculturated to Western culture. The categorization method is not able to account for different combinations of acculturation gap.

To address this issue, another method of operationally defining acculturation discrepancies has been employed called the *interaction* method. In this method, an interaction term is created by multiplying parent and child acculturation scores resulting in four interaction terms for each dimension (heritage and host). Using heritage acculturation as an example, the four possible interactions are: 1) low parent x low child

Table 1

*Methods of Operationalizing Acculturation Discrepancy with Sibling Examples*

<b>Method</b>	<b>Description</b>	<b>Example</b>
<b>Categorization</b>	Siblings are categorized into one of four acculturation strategies based on the bilinear model of acculturation: assimilated, marginalized, separated, and integrated. Then, sibling pairs are categorized as matched or mismatched on acculturation strategy.	Benign mismatch: Sibling A is integrated and Sibling B is separated.  Problematic mismatch: Sibling A is assimilated and Sibling A is separated.  High Risk: Sibling A or Sibling B is marginalized  Matched: Sibling A and B are the same
<b>Interaction</b>	Acculturation discrepancy interaction terms are created by multiplying each sibling's acculturation scores with each other. This results in four acculturation discrepancy interaction terms for each dimension of acculturation (host and heritage).	Heritage Acculturation:  1) Sibling A is high x Sibling B is low  2) Sibling A is low x Sibling B is high  3) Sibling A is high x Sibling B is high  4) Sibling A is low x Sibling B is low
<b>Subtraction</b>	The acculturation score of one sibling is subtracted from the acculturation score of the other sibling. The sign of the acculturation discrepancy score indicates the direction of the discrepancy while the value indicates the size of the discrepancy. The absolute value of the difference is also used when only size of the discrepancy is of interest.	Heritage Acculturation:  1) Sibling A – Sibling B  Absolute value = size of discrepancy Minus sign = Sibling A less acculturated Plus sign = Sibling A more acculturated

heritage acculturation, 2) high parent x high child heritage acculturation, 3) high parent x low child heritage acculturation, and 4) low parent x high child heritage acculturation. Some studies have successfully used this method in varying ways. For example, Costigan and Dokis (2006) looked at interactions between parents' and adolescents' bilinear acculturation level within both public and private acculturation domains, and its relation to child adjustment. They used standardized acculturation scores of mother, father and child to calculate mother-child and father-child interaction terms for each acculturation dimension (ethnic and host) and several public and private acculturation domains (e.g., language use, media preference, and cultural values). They found several significant interaction effects for mother-child and father-child acculturation discrepancy suggesting that parents sometimes acculturate to the host culture at a faster rate than their children and that research should examine how parent and child acculturation interact with each other to better understand the role of acculturation discrepancy and immigrant adjustment.

That being said, previous acculturation research has not quantitatively examined acculturation discrepancies in the context of the sibling relationship. A first step to approaching this emerging area of research is to investigate whether discrepancies in acculturation between siblings exist. The next step is to examine how the discrepancy relates to adjustment outcomes. To do this, the *subtraction* or *difference score* method was employed in the present study. This method is the most convenient method and has high face validity. In the subtraction method, the acculturation score of one family member is subtracted from the acculturation score (either actual or perceived) of another family member (in this case, two siblings). This results in two discrepancy scores from the bilinear acculturation perspective, one for heritage and one for host acculturation discrepancy. The sibling relationship being more horizontal rather than vertical as in the parent-child relationship, which is comprised of two distinct levels of the family system, perhaps makes the meaning of the direction of the acculturation difference (whether one sibling was more or less acculturated than the other) somewhat ambiguous at this stage in the investigation of acculturation differences between siblings. As such, only the size or magnitude of the acculturation difference was measured in this study. That is, the absolute value of the difference score on acculturation was used in the analysis to



represent acculturation discrepancy (Birman, 2006; Cespedes & Huey, 2008; Merali, 2002).

### **Perceived versus Actual Acculturation Discrepancy**

Another important issue in the measurement of acculturation discrepancy is the distinction between perceived versus actual discrepancies. Some acculturation discrepancy research focuses on perceived or subjective reports of acculturation discrepancy. In these studies, one family member reports on their own acculturation level as well as their family member's and an acculturation discrepancy is calculated using one of the above noted methods. Another method of assessing perceived acculturation discrepancy is to directly measure the participant's perception of the acculturation gap. Actual acculturation discrepancy is measured by obtaining self-reports of acculturation from both the parent and the child.

Two studies have looked at actual and perceived acculturation discrepancies between parents and adolescents. Merali (2002) measured both actual and perceived assimilation gaps in a sample of Hispanic refugee adolescents and their parents to investigate the extent to which they misjudged the level of discrepancy between them. Merali found that both parents and adolescents tended to either over- or underestimate the level of acculturation disparity. Merali suggests that misjudgment of assimilation disparity between parents and adolescents contributes to intergenerational conflict and poor mental health outcomes. The second study by Merali (2004) suggests that individual assimilation was related to actual and not perceived parent-adolescent assimilation gaps. The author posited that parents' and adolescents' lack of awareness of each other's assimilation experiences lead to the misperception of the assimilation gap. Merali posited that misperception of assimilation gaps leads to family conflict and psychological distress. Thus, perceived acculturation discrepancy was employed in the present study to examine the relation between sibling acculturation discrepancy and psychological and intercultural outcomes. In addition, actual and perceived acculturation discrepancy between siblings was also examined to explore whether siblings also misperceive each other's acculturation discrepancies.

At present, there are no known studies that have examined either the accuracy of siblings' perception of acculturation differences or the differential contribution of actual

versus perceived acculturation discrepancy to psychological adjustment from a bilinear acculturation perspective. However, these very issues are being examined in the present study, making this research one of the first to compare actual and perceived bilinear sibling acculturation discrepancy and investigate the difference in their relation to psychological adjustment and intercultural adjustment difficulties.

In summary, measurement and conceptualization of acculturation discrepancy is widely variable in the present literature making it difficult to compare findings across studies (Telzer, 2010). In keeping with the recent advancement of research on acculturation and the main goals of this research, the bilinear model of acculturation was employed in the present study to examine the relation between perceived sibling acculturation discrepancies and psychological and intercultural outcomes. Next, a review of different acculturation outcomes is outlined. This is followed by a review of research on parent-child acculturation discrepancy, maladjustment and conflict and family conflict as a mediator or moderator.

### **Acculturation Outcomes**

The acculturation process has been linked to a number of psychological, social, and physical outcomes (Moyerman & Forman, 1992; Mui & Kang, 2006; Salant & Lauderdale, 2003; Shen & Takeuchi, 2001; Thoman & Surís, 2004). Two main categories of outcome are commonly investigated in acculturation research: psychological adjustment and sociocultural adaptation (Berry, 1997; van de Vijver & Phalet, 2004; Ward & Kennedy, 1994). Psychological adjustment refers to internal outcomes such as well-being, self-esteem, life satisfaction, mental illness and overall psychological health. Sociocultural adaptation, on the other hand, involves the acquisition of behavioural or performance competencies that assist in dealing with different cultural contexts. Typically, sociocultural adaptation is studied in the context of the host culture rather than the heritage culture. Sociocultural adaptation includes proficiency in the host language, culture-specific social skills, interaction with host members, and knowledge of the host culture (Searle & Ward, 1990; Ward & Kennedy, 1994, 1999; Ward & Searle, 1991).

Much of the present literature focuses on first generation immigrants or sojourners who arrive at a host country with a pre-existing culture that is often different from that of the host country. Sociocultural adaptation to the host culture is a relevant

outcome measure for these immigrant groups. The task of acculturation for 1.5 and 2<sup>nd</sup> generation immigrants is different from that of immigrants who arrive in adulthood. Adult immigrants are faced with the task of learning to function within a new cultural context necessitating at the very least an understanding of host culture values, beliefs and customs. At the same time, adult immigrants arrive with a strong sense of their heritage culture and are clearly distinguished as foreign by the host country. The lines are less clear for immigrants who arrive before adolescence or who are born in the host country. These immigrants are influenced by the values, beliefs and customs of both host and heritage cultures simultaneously during the formative times in their lives. Their main task is to effectively negotiate between both the host and heritage cultures, which are often discrepant and opposing. Thus, it might be more meaningful to define a third outcome variable that encompasses a competence-based framework.

The concept of intercultural competence may be a more meaningful measure of adjustment for 1.5 and 2<sup>nd</sup> generation immigrants. Intercultural competence refers to the use of culturally relevant knowledge and culture-specific skills that aid in interactions within different cultures (Sodowsky & Lai, 1997; Torres & Rollock, 2007). The concept of intercultural competence acknowledges that successful adaptation in the host culture involves being able to continue functioning within one's culture of origin. This is important, given that members from the culture of origin such as family members are valuable sources of support in situations of discrimination and racism. They may also be potential sources of conflict and distress when acculturation levels differ.

To date, few studies have examined the link between acculturation and intercultural competence. Of the few studies, intercultural competence was employed as a predictor or moderator variable rather than as an outcome variable. Torres and Rollock (2004) examined the relation between intercultural competence and acculturative stress. They found that intercultural competence predicted acculturative stress above and beyond general coping and unilinear acculturation in a sample of 96 Hispanic adults. Torres and Rollock (2007) found in the same sample that intercultural competence was a moderator such that high intercultural competence concerns and high acculturation (assimilation) predicted lower depressive symptoms. In another study by Yeh et al. (2008), investigators found that English fluency, family responsibilities, having knowledge of other Asian

American cultures, career, college and academic help-seeking, and social support from a significant other predicted intercultural competence concerns in a sample of 286 Chinese immigrant high school students.

Based on this limited but emerging literature, the concept of intercultural competence was included in the present study as a relevant outcome of sibling acculturation discrepancies for young adult immigrants. The term *intercultural adjustment difficulties* was coined to acknowledge the self-report method used to operationalize this construct. Participants were asked to report on their perceived ability to adjust to both the host and heritage cultures rather than being asked to demonstrate their intercultural skills.

### **Perceived Parent-Child Acculturation Discrepancy, Maladjustment and Conflict**

Studies investigating the acculturation gap-distress model employing the bilinear acculturation model have noted mixed results. Some studies failed to find an association between parent-child acculturation discrepancy and adjustment outcomes. For example, Cespedes and Huey (2008) found that perceived parent-child discrepancies (using the subtraction method) in Anglo-Oriented and Latino-Oriented were not associated with either family functioning or adolescent depression in a sample of 13 to 18 year old Latino high school students. As well, Lau et al. (2005) looked at the effect of actual bilinear acculturation gaps between parents and adolescents in 260 Mexican American families using the categorization method. They found that neither mainstream nor heritage acculturation gaps related to family conflict or adolescent conflict problems.

In general, however, many studies have found that perceived parent-child acculturation discrepancy is related to family conflict and maladjustment (Asvat & Malcarne, 2008; Rosenthal, Ranieri & Klimidis, 1996; Ryder, Aldon & Paulhus, 2000; Smokowski & Bacallao, 2006; Tsai-Chae & Nagata, 2008; Unger, Ritt-Olson, Soto & Baezconde-Garbanati, 2009; Ying & Han, 2007). For example, Asvat and Malcarne (2008) investigated perceived bilinear acculturation discrepancy between young adult Muslims living in North America and their families using the categorization method. They found that Muslim young adults who reported being more heritage acculturated were more likely to report greater depressive symptoms over the past year when they perceived their families as having higher heritage acculturation than themselves.

Participants who were matched with their families on heritage acculturation reported fewer lifetime average depressive symptoms in the same study. Tsai-Chae and Nagata (2008) used the subtraction method to assess perceived bilinear parent-child acculturation discrepancy with a sample of 93 Asian American college students. They found that perceived parent-child discrepancy on Asian cultural values was associated with reported parent-child conflict. These studies suggest that perceived parent-child bilinear acculturation discrepancy is associated with family conflict and individual maladjustment. Thus, perceived sibling acculturation discrepancy is hypothesized to be associated with psychological adjustment and intercultural adjustment difficulties in the present study.

### **Family Conflict as a Mediator or Moderator**

The acculturation gap-distress model contends that family conflict is the mechanism through which acculturation gaps relate to adjustment. However, few studies have examined how family conflict functions to affect adjustment through acculturation gaps. Further, these studies employ not only measures of family conflict, but also related measures such as parent-child relationship quality or family pride making comparison across studies difficult. Some studies have found that parent-child relationship quality functions as a moderator of the association between acculturation gaps and adjustment. For example, Schofield, Parke, Kim and Coltrane (2008) investigated actual unilinear parent-child acculturation discrepancy in a sample of 132 Mexican American elementary students and their parents. They found that when father-child relationship quality was low in fifth grade, high father-child acculturation discrepancy in fifth grade was associated with high child externalizing problems in seventh grade and high father-child conflict. Gil et al. (1994) conducted a longitudinal study with 4,296 sixth and seventh grade Hispanic boys and they found that family pride moderated the relation between acculturative strains and self-esteem.

Other studies found that family conflict mediates the relation between acculturation gaps and negative outcomes. Juang et al. (2007) examined the mediating role of family conflict with 166 Chinese American adolescents and their parents. They found that adolescent-reported family conflict partially mediated the association between parent-adolescent discrepancies in endorsement of parental control and adolescent

depression. However, the authors employed a proxy measure of parent-adolescent acculturation gaps (parenting control discrepancy) making comparisons across studies difficult.

Previous studies provide some preliminary support for the role of family conflict in the acculturation gap-distress model in the context of the parent-child relationship. However, it is still unclear whether family conflict moderates or mediates the acculturation gap and maladjustment association. This may be due to the varied ways that family conflict is conceptualized and measured. The present study is the first known study to explore the acculturation gap-distress model in the context of the sibling relationship. Given the lack of previous research in this area and mixed findings in the parent-child acculturation gap literature, sibling relationship quality (conflict, warmth and rivalry) was hypothesized to mediate or moderate the relation between sibling acculturation discrepancy and adjustment outcomes. Acknowledging the exploratory nature of this study, both mediation and moderation effects of sibling relationship quality were examined. A review of sibling relationship quality is provided in the following review of sibling literature.

In summary, previous research suggests that perceived parent-child acculturation discrepancy and maladjustment are associated and that family adjustment plays a role in this process. However, mixed findings are noted which may, in part, be due to the variability in measurement and calculation of perceived acculturation discrepancy, outcome measures and participants' ethnic background (Telzer, 2010). The inconsistent findings may also be due to the focus on the parent-child relationship at the exclusion of other family members such as siblings (Costigan, 2010). A review of family systems theory provides support for the extension of the acculturation gap-distress model to siblings.

### **Family Systems Perspective of Siblings**

Family systems theory is a broad class of theories that characterize the family as a system comprised of different subsystems. The subsystems include individuals, dyads, triads and so on, which are typically hierarchically arranged with the family unit situated at the top of the hierarchy (Rosenblatt, 1994). Siblings have traditionally been viewed as lower-level units with the parent-child unit secondary only to the family subsystem.

Caffaro and Conn-Caffaro (2003) note that despite recognition by practitioners that sibling issues occur frequently within the context of group and family psychotherapy, siblings tend to be ignored as important and influential factors in the therapeutic process. The key concepts of family systems theory, however, suggest that the sibling subsystem is as important as any other subsystem in affecting the entire family system. For example, family systems theory suggests that subsystems are interdependent and have bidirectional influence on each other. However, research on siblings has tended to focus on the impact on the sibling relationship of changes in the spousal, parent-child or parent-sibling relationships. Proponents of the inclusion of siblings in family and group therapy assert that siblings are an important source of influence on both the individual and the family system as a whole (Caffaro & Con-Caffaro, 2003; Grunebaum & Solomon, 1980, 1982; Shapiro & Ginzberg, 2001).

Family systems theory highlights the sibling subsystem as an important unit of investigation in and of itself, and suggests that change within this subsystem is related to individual development and psychological adjustment. Applying this to the present investigation, the acculturation gap-distress model is expanded to focus on the sibling relationship. The following section reviews mainstream and marginal sibling literature to highlight the importance of siblings across the lifespan and to review research on sibling relationship quality, psychological adjustment and developmental outcomes.

### **Siblings**

There is rapidly growing interest in research on families as an important context in which to study individual adjustment. However, despite this recognition there continues to be a neglect of the family in research, most especially with respect to sibling relationship. No other place is this neglect more apparent than within the multicultural psychology literature where relationships between family members may be especially important to understanding acculturation and adjustment. As such, Noller (2005) cautions that the literature is presently skewed toward families from Western cultures and that information about families garnered thus far must be understood within this specific context. The review of sibling literature to follow is cognizant of this context and research focused on Western and immigrant cultures are differentiated where possible.

### **Siblings Across the Lifespan**

It is rather striking that the sibling relationship should be overlooked given that it is considered by some to be the most enduring relationship relative to all others including the parent-child or friend relationship (Noller, 2005). As Ramu (2006) so clearly asserts, “sibling relationships are unique because they endure throughout one’s life and are firmly situated in one’s genetic, familial, and cultural roots”(p. 3). Cicirelli (1982, 1985b, 1995), a pioneer of the life span approach, proposes that the relationship between siblings is salient in all phases of an individual’s life cycle and that the relationship changes over time. In Western cultures, for example, Cicirelli (1982) noted that siblings tend to have strong emotional ties to one another in childhood, voluntary ties in middle age and instrumental ties in old age. He suggested that infant siblings share in the experience of discovering their world, starting within their immediate family. Then, in middle childhood such variables as birth order and gender dictate how particular roles in the family are established. These roles serve to define the limits of behaviour, self-image, perceptions of other siblings, and interactions with siblings and others in the world. Cicirelli believed that in young adulthood and middle age, sibling relationships became more voluntary, based more on individual volition and preference. In adulthood, siblings tend to feel close to one another and this closeness seems to increase into old age. For the most part, he noted that siblings tend to experience less rivalry in adulthood and old age and though feelings of resentment and envy may exist, they tend to highly value their siblings relationships (Cicirelli, 1991).

In a review of cross-cultural sibling research, Cicirelli (1994) compares the importance and role of siblings across the lifespan in industrialized and non-industrialized societies. He notes that siblings in industrialized societies tend to be treated equally by parents and are socialized to lead relatively independent lives while siblings in non-industrialized societies are assigned specific roles by parents to assist with socializing and transmitting cultural knowledge to other siblings with the goal of maintaining the family. These roles include sibling care-taking, disciplining, teaching cultural knowledge, negotiating marriages, and providing or sharing economic resources. A major difference noted by Cicirelli is that sibling relationships in non-industrialized societies are not voluntary as they tend to be in industrialized society. This increases the



likelihood that siblings remain influential to each other into the adult years. He concludes that sibling relationships in non-industrialized societies, by virtue of the cultural norms that dictate their interactions with one another, play a significant role in family functioning and adaptation.

Thus, the sibling relationship serves an important function to the family and individual across the lifespan. The roles that siblings play within families across the lifespan likely differ across cultures. Siblings from cultures where the sibling relationship is obligatory are likely more influential in each other's lives into adulthood. Next, a review of ethnographic descriptions of siblings in Vietnamese and Chinese cultures reveals their significance to family and individual adjustment.

### **Siblings in Vietnamese and Chinese Cultures**

The cultural ideologies of the Vietnamese and Chinese are derived from one source – the teachings of Confucius. Cultures based on Confucianism follow the principles of respect, obedience, loyalty, filial piety, and harmony. Together, these principles operate to inform interactions among family members. There is a distinct hierarchy within many Asian families that is based on age and gender (Strom, Park, & Daniels, 1987). Within this system, older members hold higher status than younger members while male members hold higher status than female members (Rutledge, 1982; Uba, 1994). This hierarchy extends into the sibling relationship where younger siblings are expected to respect and obey older siblings. In return, elder siblings are expected to be positive role models for their younger siblings, teach them about the heritage culture, and provide primary care and discipline (Ervin-Tripp, 1989). Further, elder siblings are expected to assist their younger siblings in making important decisions about dating and suitable marriage partners, education and career choices, and in providing financial support (Weisner, 1993). Even when siblings marry or leave the home for work or school, they are expected to continue this high degree of involvement in each other's lives and to maintain the principles of filial piety, respect, and harmony. Some researchers have noted that within Vietnamese families, the sibling relationship takes precedence over the parent-child relationship (e.g., Forrest, 1982; Rutledge, 1992). Indeed, Rutledge (1992) noted that for the Vietnamese, “one mark of a virtuous family

was harmony between and among siblings” (pg. 118). Thus, conflict among siblings is considered a grave failure on the part of parents to promote harmony within the family.

The high degree of mutual involvement between siblings means that they have powerful influence on developmental and acculturative processes. Siblings have the opportunity to strengthen traditional ethnic practices through teaching and observing or modeling as well as to introduce one another to extra-familial and extra-cultural practices and customs such as language, clothing, food, and political ideas (Bryant, 1992). As well, when siblings converge on acculturative paths there is an opportunity to influence immigrant parents’ acculturation. There is also a strong potential for increased conflict within the family and maladjustment when siblings’ acculturation paths diverge. Thus, siblings in Vietnamese and Chinese families are well poised to impact each other’s acculturation and adjustment.

### **Sibling Acculturation Discrepancy and Family Relations**

Despite acknowledgement in the literature of the importance of siblings to family and individual adjustment across the lifespan, few studies have investigated siblings in the context of acculturation. To date, only one study exploring sibling acculturation discrepancy and family relations has been conducted. Pyke (2005) examined the impact of unilinear acculturation discrepancies between siblings on family relations with 32 Korean- and Vietnamese-American young adults aged 18 to 25 using a qualitative approach. The author found that “the primary acculturative divide in the families studied was between traditional and assimilated siblings, and not, as emphasized in the immigrant family literature, between parents and children” (p. 503-504). Pyke (2005) noted that tensions, conflicts and resentments between siblings tended to center on differences in cultural value systems between individualism and collectivism. Siblings who identified themselves as more acculturated toward the host culture (typically younger) reported feeling resentment toward their siblings who they identified as being more acculturated towards heritage culture (typically older) because the latter were often given more authority to discipline the former.

Furthermore, older siblings, who tended to be more acculturated towards the heritage culture, were familiar with both the language of origin and the host language (i.e., English) compared to their less heritage acculturated siblings. These older, more

heritage acculturated siblings had greater knowledge of the host culture than their parents. Given these advantages, older siblings were able to thwart younger siblings' efforts to rebel against their parents. This contributed to the younger sibling's increased resentment toward the older sibling. As well, Pyke (2005) found that more heritage acculturated siblings felt resentment towards their more host acculturated siblings because they had more freedom to live independent lives. That is, the parents often relied more on the heritage acculturated (more traditional) child to model ethnic values and behaviours, to translate documents and other correspondence, and to provide childcare to younger siblings while less heritage acculturated children were free from such responsibilities.

Despite these negative effects on sibling relationships, Pyke (2005) also found that differences in acculturation among siblings contributed to some positive outcomes. For example, more host acculturated siblings often reported that they appreciated their more heritage acculturated siblings for their consistent support, cultural and language brokering assistance with their parents, and maintaining ethnic ties that would otherwise be lost in the absence of their parents. As well, more heritage acculturated siblings appreciated their more host acculturated siblings for helping them to be more open-minded and to understand the customs and practices of the host culture better.

In summary, the sibling literature provides ample support for the significance of the sibling relationship in family and individual adjustment across the lifespan. Further, sibling influence in immigrant Vietnamese and Chinese families may extend to the adaptation process. However, there is a current gap in the literature of research exploring the role of siblings in the adaptation process of immigrant families. Thus, the main purpose in the present study is to fill this gap by extending the acculturation gap-distress model to include siblings. As part of this aim, sibling relationship quality is explored as the family adjustment variable in the acculturation gap-distress model. According to the model, family adjustment moderates the relation between acculturation discrepancies and adjustment. A review of the sibling relationship quality literature as it relates to socio-emotional development and adjustment is offered next.

### **Sibling Relationship Quality**

#### **Conceptualization of Sibling Relationship Quality**

There appears to be relative consistency in the literature on the defining features of sibling relationship quality. Furman and Buhrmester (1985) investigated the components of sibling relationship quality in a sample of 49 upper elementary school children aged 11 to 13 years old. Their analysis revealed four relationship qualities characterizing sibling relationships: warmth/closeness, relative status/power, conflict, and rivalry. Previous conceptualizations of sibling relationship quality conceived of positive and negative components that existed on opposite ends of the same continuum (e.g., Deater-Deckard, Dunn, & Lussier, 2002). However, several investigators have now found that these qualities are conceptually independent from one another and, positive and negative components of sibling relationship quality have been found to be uncorrelated with one another (Cicirelli, 1991; Howe et al., 2000; Stocker & McHale, 1992). In general, sibling relationship quality consists of warmth/closeness, conflict, rivalry, and status/power.

Research on adults has yielded somewhat different results on the dimensions of sibling relationship quality from studies conducted with children and adolescents. Stocker, Lanthier and Furman (1997) investigated the characteristics of adult sibling relationships with the goal of developing a self-report measure of adult sibling relationship quality. The sample was comprised of 383 undergraduate students from two American cities. Participants reported on their relationship with siblings who were at least 17 years of age. Results indicated that quality of sibling relationship in adulthood was characterized by three of the four dimensions found in previous studies on children: warmth, conflict, and rivalry. Research has suggested that issues of power and status in sibling relationships become somewhat less salient in the years of young adulthood (Stewart, Kozak, Tingley, et al., 2001). These findings suggest that the quality of adult sibling relationships may differ from that of children and adolescents and thus, research examining this construct must consider the developmental stage of the population being studied. In the present study, the population of interest is young adults and thus, only warmth, conflict and rivalry will be explored as potential moderators or mediators.

### **Sibling Relationship Quality in Young Adulthood**

Research suggests that quality of sibling relationship shifts as individuals transition from middle childhood to adolescence to young adulthood (Buhrmester &

Furman, 1990; Dunn, Deater-Deckard, Pickering, & Golding, 1999; Feinberg, McHale, Crouter, & Cumsille, 2003; Sharf et al., 2005; Stewart et al., 2001; Stocker, Lanthier, & Furman, 1997). However, Dunn (1993) notes that sibling pairs are vastly different from dyad to dyad on the quality of their relationship with some being close and intimate while others are hostile and rife with conflict, and still others are indifferent and cold. This variability in sibling relationships has yielded somewhat contrasting bodies of literature on sibling relationship quality in adulthood.

Some researchers have noted that sibling conflict decreases in young adulthood. For example, Scharf et al. (2005) found that Israeli young adults reported less conflict and rivalry in their sibling relationship compared to adolescents. They suggested that this decrease in conflict and rivalry was related to their increased ability to resolve conflicts with peers and the decreased amount of time they spent with their siblings decreasing the likelihood of conflicts compared to their adolescent counterparts. Other researchers have suggested that these decreases in conflict and specifically rivalry in adulthood result from changes in siblings' relationship with their parents. Feinberg, et al.(2003) conducted a 2-year longitudinal study investigating the relation between changes in the sibling relationship and differential changes in the parent-child relationship of 185 adolescent first- and second-born sibling dyads and their parents. They found that as differences in parent-child warmth increased between the two siblings, first-born siblings reported increased warmth and decreased conflict while second-born siblings reported increased warmth.

Buhrmester and Furman (1990) suggested that decreases in relationship intimacy within adolescent sibling relationships are a consequence of autonomy-seeking, a normal developmental process whereby children individuate from parents and siblings. As siblings move into young adulthood the need for autonomy increases and physical separation becomes salient as older siblings move out of the home to attend school or work. During this period, young adults begin to emotionally invest more in romantic relationships. Along with increases in emotional and physical separation are further decreases in negative aspects of sibling relationship.

For example, Stewart et al. (2001) found that young adults reported less conflict with their siblings, and less quarrelling, antagonism, competition and conflicts about

power compared to adolescents. The authors suggest that as siblings transition into adulthood they begin to lose important relationships such as close friends and parents which increases the importance of siblings. Some suggest that these decreases in conflict within the young adult sibling relationship might reflect the reduced amount of time siblings spend with one another either because of involvement in other life activities or because of purposefully limiting contact with each other (Stocker et al., 1997). Others argue that decreases in sibling conflict does not necessarily mean decreased closeness but rather improved ability to negotiate disagreements in the relationship and a preference for negotiation over aggressive or coercive approaches (Laursen, Finkelstein & Townsend-Betts, 2001). Sharf et al. (2005) found that emerging adults had sibling relationships that were less in conflict and higher in warmth than adolescents based on self-, parent- and sibling-report.

In contrast, some researchers have noted increases in conflict and rivalry in adolescence and adulthood (Brody et al., 1994). Within both academic and non-academic arenas, it has often been noted that a defining feature of the sibling relationship is conflict, especially during childhood and adolescence (e.g., Furman & Buhrmester, 1985; Volling, 2003). From this perspective, increased conflict in adolescence is seen as a normative part of sibling relationships with important developmental functions (Dunn, 1983; Raffaelli, 1992). Brody et al. (1994) conducted a longitudinal study investigating the contributions of child temperament and family relationships to changes in sibling relationship quality. They found that older siblings' ratings of sibling relationship quality changed over the span of 4 years with higher reports of negative relationship qualities and lower reports of positive qualities.

### **Sibling Relationship Quality and Socio-emotional Development**

Given the enduring nature of the sibling relationship, its potential impact on social and emotional development may be considerable. Indeed, the steadily growing sibling literature suggests that siblings influence human development and quality of life in various significant ways (Cicirelli, 1991, 1995; Deater-Deckard et al., 2002; Dunn, 1993; Goetting, 1986; Howe, Aquan-Assee, Bukowski, et al., 2001). Many studies have highlighted the importance of siblings in the socialization process noting both positive and negative effects (e.g., Bank, Burraston, & Snyder, 2004; Dunn, 1999; Patterson,

1986). Siblings have been found to play a role in development of empathy, emotional understanding, and emotional self-disclosure (Howe, Aquan-Assee, Bukowski, et al., 2001; Tucker, Updegraff, McHale, & Crouter, 1999). For example, Tucker et al. (1999) examined older sibling characteristics of expressivity, empathy, positivity, relationship quality and their influence on younger siblings' development of empathy during pre- and early adolescence in a sample of 199 European American sibling dyads. The authors found that younger siblings were higher in empathy when their older siblings were males and were high in positivity. Additionally, older brothers' empathy was associated with younger sibling's empathy, expressivity of emotional experience and reports of positivity in the sibling relationship.

With respect to self-disclosure and emotional understanding, two important factors in the development and maintenance of relationships in adolescence and adulthood, have been found to be associated with quality of sibling relationship. For example, Howe, Aquan-Assee, Bukowski et al. (2001) investigated the association between sibling self-disclosure, emotional understanding and sibling relationship warmth in forty 5<sup>th</sup> and 6<sup>th</sup> grade European American children. They found that children who perceived warm sibling relationships were more likely to self-disclose emotions to their siblings and have higher levels of emotional understanding.

A growing body of emerging literature suggests that sibling conflict contributes to the development of socio-emotional competence including interpersonal boundaries, conflict resolution, perspective-taking, individuation, and tolerance and management of negative emotions across the lifespan (Bedford, Volling, & Avioli, 2000; Brody, 1998; Brown & Dunn, 1996; Herrera & Dunn, 1997; Raffaelli, 1992). Sibling conflict in childhood and adulthood has been found to be linked to positive outcomes in adulthood. In a descriptive study, Bedford et al. (2000) asked 40 adults about the benefits they derived from conflict with their siblings both in childhood and in adulthood. They found that adults identified four categories of benefits from sibling conflicts: improved parenting skills, social competence, improved sibling relationship, and increased sense of self.

Overall, the findings suggest that both positive and negative components of sibling relationship quality are important to socio-emotional development across the

lifespan. In general, warmth and moderate levels of conflict in the sibling relationship are associated with positive socio-emotional development. Sibling relationships plagued by overly conflictual or overly uninvolved features contributes to poor social and emotional outcomes. Further, these studies suggest that positive and negative aspects of sibling relationship quality can co-exist on independent continuums and contribute differentially to development (Cicirelli, 1991; Howe, Aquan-Assee, Bukowski, et al., 2000; Stocker & McHale, 1992).

Overall, studies suggest that conflict tends to decrease across the lifespan while warmth tends to increase. The majority of these studies were conducted with siblings from Caucasian ethnic backgrounds. At present, little is known about sibling relationship quality within different developmental stages for siblings of Asian ethnic backgrounds. The present study provides some preliminary understanding of sibling relationship quality in Vietnamese and Chinese young adults.

### **Sibling Relationship Quality and Psychological Adjustment**

Quality of sibling relationship has also been found to relate to psychological adjustment across the lifespan (Bank, Patterson, & Reid, 1996; Graham-Bermann, Cutler, Litzenberger, & Schwartz, 1994; Modry-Mandell, Gamble, & Taylor, 2007; Pike, Coldwell, & Dunn, 2005; Stocker et al., 1997; Sherman, Lansford, & Volling, 2006; Waldinger, Vaillant & Orav, 2007; Yeh & Lempers, 2004). In general, mainstream sibling research suggests that positive aspects of the sibling relationship such as warmth, closeness or positivity are related to positive psychological outcomes while negative aspects such as conflict or distance are related to poor psychological outcomes. For example, Stocker, et al. (1997) examined 383 young adults' perception of their sibling relationships and its association with psychological functioning as defined by the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) and self-esteem. They found that better psychological functioning and self-esteem was associated with lower levels of conflict in the sibling relationship. Acknowledging the correlational nature of the data the authors suggest that siblings with poor psychological functioning might be more inclined to perceive their sibling relationships as more conflictual or that conflicts within adult sibling relationships contribute to poorer psychological functioning and lower self-esteem.



The limited research on sibling relationships of non-Caucasian young adults suggests that patterns of association between sibling relationship quality and psychological outcome is similar to Caucasian siblings. Fuligni and Masten (2010) investigated the relation between conflict with parents and siblings and psychological distress and well-being in a sample of 220 young adults from Latin American, East Asian, Filipino and European ethnic backgrounds. They found that while conflicts with parents and sibling occurred infrequently (roughly once per month), the conflict was related to psychological distress, happiness and feelings of guilt and this finding was similar across most ethnic groups. Interestingly, they found that Filipino young adults reported less family conflict than the other groups, but more psychological distress and poorer well-being as a result of the conflict than the other groups suggesting that exploring psychological outcomes in specific ethnic groups is necessary to gain an accurate understanding of the role of siblings for different immigrant groups.

In summary, siblings play an important role in individual's development and psychological adjustment across the life span. In particular, the literature suggests that dimensions of sibling relationship quality are related to socio-emotional development and psychological adjustment outcomes of a person. However, the majority of the existing studies are conducted within the context of Euro-American perspectives of family structure and sibling relations, the findings of which may not generalize to immigrant groups such as the Vietnamese and Chinese young adults. Despite the lack of empirical studies, some research on immigrant Asian families suggests that siblings do play an important role within the family in ways that might impact immigrants' adaptation and adjustment directly or indirectly.

### **The Present Study**

The objective of the present study was to expand upon the acculturation gap-distress model by examining acculturation discrepancies within the context of the sibling relationship for young adults of Vietnamese and Chinese backgrounds in Canada. A concurrent mixed method nested design (Hanson et al., 2005) placing the main focus on quantitative results and employing qualitative data to aid the interpretation of the quantitative data was adopted in the present study. Based on the existing literature review, it was hypothesized in the present study that perceived sibling acculturation

discrepancy would be related to immigrant young adults' psychological adjustment and intercultural adjustment difficulties. Further, sibling relationship quality would be a possible mediator or moderator between sibling acculturation discrepancy and adjustment outcomes.

In addition, three specific research-related issues were examined in this study. First, previous studies of acculturation have typically lumped different ethnic subgroups into the same pan-ethnic category (e.g., Rogler et al., 1991). Studying groups based on pan-ethnic labels such as Asian or Hispanic may obscure the unique experiences of individual subgroups with respect to distinct cultural ideology and the course and outcome of acculturation and adjustment. For example, Cambodian and Vietnamese refugees are more likely than other Asian groups to have experienced trauma prior to arriving to the host country and to have post-traumatic stress that may have a distinct course from those of other Asian subgroups (Carlson & Rosser-Hogan, 1993; Nwadiora & McAdoo, 1996). Even in specific ethnic subgroups there may be within-group variations in experiences that may result in differing patterns of acculturation. For example, Vietnamese refugees to the United States departed from Vietnam in two distinct waves with vastly differing pre- and post-arrival experiences (Dorais, 2000; Rumbaut, 1998; Rutledge, 1992). The varied differences among Asian immigrant sub-groups suggest that their immigrant children will also have differing developmental and cultural experiences. To address this issue, the present study focused specifically on Vietnamese and Chinese young adults because of their similar underlying cultural characteristics and ideologies rooted in Confucianism. But, given that Vietnamese and Chinese immigrants experienced vastly different pre-immigration, immigration, and settlement experiences in Canada, they were compared in the present study to examine whether there were differences between these groups on key study variables.

Second, the literature is inconsistent with respect to the use of actual versus perceived acculturation discrepancy. Previous research suggests that immigrant parents and their children tend to over- or under-estimate acculturation differences between them (Merali, 2002). The misperception in acculturation between immigrant parents and their children is posited to result in family conflicts and maladjustment (Merali, 2002). At present, there are no studies examining whether immigrant siblings also misperceive

acculturation differences. Thus, actual and perceived sibling acculturation discrepancy was compared in the present study to determine whether siblings misperceive acculturation differences between them.

Finally, some researchers have suggested that the conflicting findings in the current acculturation gap literature are due to the inconsistent use of perceived and actual acculturation gap measures in studies (Telzer, 2010). As yet, however, there have been no studies comparing the differential relation between perceived or actual acculturation discrepancy and adjustment outcomes. The present study attempts to fill this gap in the literature by investigating the differential effects of perceived and actual sibling acculturation discrepancy on psychological adjustment and intercultural adjustment difficulties.

At present, there is a lack of research on sibling acculturation discrepancy and its role in the adjustment outcomes of immigrant young adults. Only one qualitative study was found in the literature search for this review that examines sibling acculturation discrepancy in the context of family relations (Pyke, 2005). Qualitative research provides a rich and in depth understanding of family processes and can identify important variables for further research. In addition, qualitative analytic strategies can provide a context and assist with the interpretation of quantitative findings (Creswell, 2005). Given the exploratory nature of the present research, qualitative data were also collected and analyzed using thematic analysis to help explain the quantitative findings.

The bilinear acculturation perspective was employed in the present study because it is more in line with current conceptualizations of acculturation. Further, the bilinear approach is a psychometrically more robust approach to assess acculturation than the unilinear approach in that the independence of host and heritage acculturation has been reliably demonstrated in previous research (Ryder et al., 2000).

The young adult group was of interest in the present study as most studies on siblings in the extant literature focus on the child and adolescent age groups. Cicirelli (1995) noted that the “greatest gap in knowledge about the course of sibling relationships across the lifespan is in young adulthood” (p. 218). Researchers have suggested that the acculturation process varies as a function of developmental stage (Fuligni, 2001; Telzer, 2010). At present, little is known of the nature of sibling relationships in young adulthood

and its relation to the acculturation process. For immigrants of collectivistic cultures, it may be crucial to examine the acculturation process of young adults and the sibling relationship for several reasons. First, because of their interdependence on their families, Asian immigrant children, in general, often struggle with issues of autonomy and identity development at a later age than what Western conventions would suggest (Fuligni, 1998; Kwak, 2003). As such, siblings likely continue to play an important role in the lives of Asian immigrant young adults. Second, Asian immigrant young adults are at a critical juncture in their lives where they must negotiate between the collectivistic values of their families and the individualistic values of the larger dominant society. Siblings who may be facing the same acculturative challenges are well poised to impact each others' acculturative paths. Thus, the sibling relationship of Vietnamese and Chinese young adults is particularly relevant to the study of acculturation gaps and adjustment outcomes.

Previous research on acculturation within the family context has tended to focus on mostly psychological adjustment outcomes of acculturation such as depression, anxiety and self-esteem. Some studies have looked at sociocultural adaptation outcomes as well. However, sociocultural adaptation is traditionally studied within the context of the host culture alone. Young adult immigrants living in pluralistic societies like Canada face the challenge of negotiating between two different cultural contexts. Thus, understanding sociocultural adaptation alone does not fully capture this unique experience. Instead, the construct of intercultural adjustment difficulties may be more relevant to the acculturation experience of immigrants within both the host and heritage cultures. Thus, both psychological adjustment and intercultural adjustment difficulties were examined in the current study.

### **Research Questions and Hypotheses of the Study**

The following section outlines the proposed research questions and hypotheses based on relevant literature discussed in the preceding sections. Two samples were collected in order to address the research questions. The main sample was comprised of individual Vietnamese and Chinese young adults and was utilized to address research questions 1, 2 and 3. A separate sample of sibling pairs was also collected to address research questions 4 and 5.

## Main Research Interests

**Research Question 1: Relations between Perceived Sibling Acculturation Discrepancy and Adjustment.** Is perceived sibling acculturation discrepancy associated with psychological adjustment and intercultural adjustment difficulties? The first main focus of the present research was the association between sibling acculturation discrepancies and two individual outcome variables – psychological adjustment and intercultural adjustment difficulties. While findings in the acculturation gap-distress literature have been somewhat mixed, in general, the literature suggests that parent-child acculturation discrepancy is related to poor psychological adjustment. Thus, it was hypothesized that perceived host and heritage sibling acculturation discrepancy is associated with poor psychological adjustment.

To date, no studies have examined the relation between acculturation discrepancy and intercultural adjustment difficulties. A few studies have looked at intercultural adjustment difficulties as a predictor of acculturative stress and as a moderator between acculturation and depression (Torres & Rollack, 2004, 2007). Intercultural adjustment difficulties as an outcome variable has not been investigated previously. One study examined cultural adjustment difficulties as an outcome variable of which intercultural competence concerns was a component (Shim & Schwartz, 2007). In this study, length of residence, low behavioural assimilation and high Asian values predicted cultural adjustment difficulties. Given that intercultural adjustment difficulties has not been investigated previously in the context of either parent-child or sibling acculturation discrepancy, specific hypotheses regarding the direction of association between sibling acculturation discrepancy and intercultural adjustment difficulties are not made.

***Hypothesis 1a.*** Perceived sibling Heritage acculturation discrepancy will be negatively associated with psychological adjustment.

***Hypothesis 1b.*** Perceived sibling Canadian acculturation discrepancy will be positively associated with psychological adjustment.

***Hypothesis 1c.*** Perceived sibling Heritage acculturation discrepancy will be associated with intercultural adjustment difficulties.

*Hypothesis 1d.* Perceived sibling Canadian acculturation discrepancy will be associated with intercultural adjustment difficulties.

**Research Question 2: Sibling Relationship Quality as a Moderator or Mediator.** Does sibling relationship quality moderate or mediate the association between perceived sibling acculturation discrepancy and psychological adjustment and intercultural adjustment difficulties? The second objective of the present study was to investigate the possible moderating or mediating role of sibling relationship quality on the relation between sibling acculturation discrepancy and adjustment outcomes as have been suggested in the acculturation gap-distress model. For instance, immigrant family conflict literature theorizes that intergenerational conflict is an inevitable consequence of acculturation differences within the family (Fang & Wark, 1998) and that acculturation differences between parents and children are linked to individual adjustment outcomes. Previous studies have shown support for family adjustment as both a mediator and moderator of the acculturation gap-distress link (Gil, Vega & Dimas, 1994; Juang et al., 2007; Schofield et al., 2008). Given the limited research exploring the moderating or mediating role of family adjustment in the parent-child acculturation discrepancy literature and the lack of such studies in the sibling literature, only general hypotheses were made.

*Hypothesis 2a.* Sibling relationship quality will mediate or moderate the relation between sibling Heritage acculturation discrepancy and psychological adjustment.

*Hypothesis 2b.* Sibling relationship quality will mediate or moderate the relation between sibling Canadian acculturation discrepancy and psychological adjustment.

*Hypothesis 2c.* Sibling relationship quality will mediate or moderate the relation between sibling Heritage acculturation discrepancy and intercultural adjustment difficulties.

*Hypothesis 2d.* Sibling relationship quality will mediate or moderate the relation between sibling Canadian acculturation discrepancy and intercultural adjustment difficulties.

To test these hypotheses, several variables were measured and controlled in this investigation because of their potential confounding influence on psychological

adjustment and intercultural adjustment difficulties. These included: length of residence, generational status, Canadian acculturation, heritage acculturation, English language use and proficiency, Heritage language use and proficiency, birth order, gender, and sibship gender.

### **Additional Research Questions**

**Research Question 3: Differences between Vietnamese and Chinese Young Adults.** Do Vietnamese and Chinese Canadian young adults differ with respect to the study variables, if so in what way? While these two ethnic groups share similar underlying cultural characteristics and ideologies, studying groups by lumping them together based on pan-ethnic labels such as Asian or Hispanic may obscure the unique experiences of individual subgroup with respect to the course and the outcome of acculturation and adjustment. For example, Vietnamese refugees are more likely to have experienced trauma prior to arriving at the host country and to have post-traumatic stress that may have a distinct course from those of other Asian subgroups (Carlson & Rosser-Hogan, 1993; Nwadiora & McAdoo, 1996). Berry's Acculturation Framework (Berry, 1992) suggests that differing pre- and post-migration experiences (e.g., immigration status, culture of origin, host culture reception) must be considered when conducting acculturation research as they may be associated with different acculturation paths and outcomes for immigrants. To investigate possible differences between these two ethnic groups, Vietnamese and Chinese participants were compared on a range of study variables including acculturation level, sibling acculturation discrepancy, sibling relationship quality, psychological adjustment and intercultural adjustment difficulties. Given that this area has yet to be examined, specific hypotheses were not made.

***Hypothesis 3.*** Vietnamese and Chinese Canadian young adults will differ on the following study variables: acculturation, sibling acculturation discrepancy, sibling relationship quality, psychological adjustment and intercultural adjustment difficulties.

**Research Question 4: Sibling Misperceptions of Acculturation Discrepancies.** Do siblings misperceive acculturation differences between themselves? Previous research suggests that immigrant parents and children tend to over- or under-estimate acculturation differences between them (Merali, 2002). It is not known whether siblings

also make the same mistakes in misjudging acculturation differences between each other. The present study is the first to examine this issue by comparing siblings' actual and perceived acculturation discrepancies. Based on previous research, it was hypothesized that actual and perceived sibling acculturation discrepancy within both the host and heritage domains would differ.

*Hypothesis 4a.* Actual and perceived host acculturation discrepancy will differ significantly for both older and younger siblings.

*Hypothesis 4b.* Actual and perceived heritage acculturation discrepancy will differ significantly for both older and younger siblings.

**Research Question 5: Actual or Perceived Acculturation Discrepancy and Adjustment Outcomes.** Is perceived or actual acculturation discrepancy associated with psychological adjustment and intercultural adjustment difficulties? To date, there are no known studies that have compared actual and perceived acculturation discrepancy in the context of individual outcomes. Merali (2002) suggests that perceived acculturation discrepancy may be a more important factor in adjustment outcomes and family relations than actual acculturation discrepancy. An exploratory analysis of this research question using sibling pairs data was conducted. Based on the limited previous research, perceived acculturation discrepancy was hypothesized to have a stronger association with psychological adjustment and intercultural adjustment difficulties than actual acculturation discrepancy.

*Hypothesis 5a.* Perceived Canadian acculturation discrepancy will be more strongly associated with psychological adjustment than actual Canadian acculturation discrepancy.

*Hypothesis 5b.* Perceived heritage acculturation discrepancy will be more strongly associated with psychological adjustment than actual heritage acculturation discrepancy.

*Hypothesis 5c.* Perceived Canadian acculturation discrepancy will be more strongly associated with intercultural adjustment difficulties than actual Canadian acculturation discrepancy.



***Hypothesis 5d.*** Perceived heritage acculturation discrepancy will be more strongly associated with intercultural adjustment difficulties than actual heritage acculturation discrepancy.

## CHAPTER II

### Methodology

This chapter reviews participant characteristics, recruitment, instrumentation, procedure, and design. The target sample and the measures employed in this study are described in the first section while the study procedure and data analytic strategy employed are discussed in the second section.

#### Participants

Two samples were independently collected to address the research questions. Quantitative data from the main sample were utilized in the analyses for research questions 1, 2 and 3. Responses of participants in the main sample to the open-ended questions were used in the qualitative analysis. Quantitative data from the sibling pairs sample were utilized in the analyses for research questions 4 and 5.

**Main Sample.** In total, 226 participants completed the web-based survey, which was comprised of 187 participants from the initial recruitment effort and an additional 39 participants from the recruitment of sibling pairs. Forty-nine cases were excluded from analyses because they were missing two or more measures (greater than 20% of missing data) and an additional 27 cases were further excluded from analyses because they did not meet study criteria or were duplicates. The final main sample consisted of 150 participants.

The main sample participants ranged in age from 17 to 29 years ( $M = 21.51$ ,  $SD = 3.03$ ). Seventy-six percent of the participants were female ( $n = 114$ ) with 24% being male ( $n = 36$ ). Twenty-seven percent ( $n = 41$ ) of participants self-identified as Vietnamese while 53% ( $n = 80$ ) self-identified as Chinese. Of the female participants, 50.9% ( $n = 58$ ) identified a male sibling and 49.1% ( $n = 56$ ) identified a female sibling. Of the male participants, 61.1% ( $n = 22$ ) identified a female sibling and 38.9% ( $n = 14$ ) identified a male sibling. The number of years the participant resided with their identified sibling ranged from 10 to 29 years ( $M = 18.94$ ,  $SD = 3.23$ ). Forty-four percent ( $n = 66$ ) of participants were second-born while 37.3% ( $n = 56$ ) were first born. Over ninety percent of participants were 1.5 or 2<sup>nd</sup> generation ( $n = 136$ ).

**Sibling Pairs Sample.** Fifty-one participants completed the web-based survey during the recruitment of the sibling pairs. Fifteen participants were excluded due to

duplication of cases, cases not meeting study criteria, cases without a matched sibling pair, and cases missing two or more measures. The final sibling pairs sample consisted of 18 sibling pairs. The participants ranged in age from 16 to 29 years ( $M = 21.44$ ,  $SD = 3.82$ ). Over eighty percent of participants were females ( $n = 29$ ). Ten sibling pairs (55.6%) were female-female sibling dyads while 8 sibling pairs (44.4%) were male-female sibling dyads. Most of the sibling pairs self-identified as Chinese (69.4%;  $n = 25$ ) while 16.7% ( $n = 6$ ) self-identified as Vietnamese and 11.1% ( $n = 4$ ) self-identified as both Vietnamese and Chinese. The number of years the participants resided with their identified sibling ranged from 10 to 29 years ( $M = 17.94$ ,  $SD = 3.82$ ). Tables 2 and 3 display the means and percentages of demographic characteristics for both data sets.

### **Recruitment**

Prior to data collection, the research proposal was approved by the Research Ethics Board (REB) at the University of Windsor. All subsequent modifications to the study were submitted to the REB for re-approval as necessary.

**Sampling.** In acknowledging the realities and methodological issues inherent in conducting sibling research, the sampling recommendations by Cicirelli (1995) were followed. In the present study, only full siblings with the same biological parents were included in the study given that divorce and separation are much less likely in older cohorts as suggested by Cicirelli (1995). To further simplify sampling from this population, age and age spacing were used as sampling criteria while gender, birth order, sibship size, and sex composition of sibling dyad were included in analyses as control variables. Finally, participants were asked to select a sibling to compare themselves to based on specific criteria (i.e., the sibling that is most different from them on acculturation). While this does not fully account for all sibling experiences in a family, Cicirelli (1995) notes that it is likely the best solution available to sibling researchers.

**Main Sample Recruitment Criteria.** In the first recruitment effort, individual participants were recruited for the study if they met the following criteria: a) they were between 18 to 29 years old; b) they were self-identified as Vietnamese or Chinese; c) they had at least one biological sibling between the ages of 16 to 29 residing in Canada; and d) the identified sibling had resided with the participant for at least 10 years over part of the participant's childhood and adolescence. Criterion c) and d) were included to

Table 2

*Means of Selected Demographic Variables of Vietnamese and Chinese Young Adults*

	Variable	Vietnamese		Chinese		Total	
		<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>N</i>	<i>M (SD)</i>
Main Sample	Age	52	20.67 (2.76)	85	22.01 (3.12)	150	21.51 (3.67)
	Years living with Sibling	52	18.40 (2.75)	85	19.09 (3.42)	150	18.92 (3.23)
	Years in Canada	52	19.94 (2.82)	85	21.18 (3.81)	150	20.79 (3.47)
Sibling Pairs	Age	6	22.50 (3.94)	25	21.16 (3.86)	36	21.44 (3.83)
	Sibling Age	6	21.67 (3.01)	25	21.12 (3.79)	36	20.86 (5.07)
	Years living with Sibling	6	16.17 (3.71)	25	18.32 (3.56)	36	17.94 (3.82)
	Years in Canada	6	21.50 (4.51)	25	18.60 (7.14)	36	19.53 (1.08)

Table 3

*Demographic Variables for Vietnamese and Chinese Young Adults*

Variable	Main Data (N = 150)		Sibling Pairs (N = 36)	
	<i>n</i>	%	<i>n</i>	%
<b>Gender</b>				
Male	36	24	7	19.4
Female	114	76	29	80.6
<b>Sibship Gender</b>				
Female/Female	56	37.3	10	55.6
Male/Male	14	9.3	0	0
Female/Male	79	52.7	8	44.4
<b>Birth Order</b>				
First	56	37.3	16	44.4
Second	66	44	18	50
Third	18	12	2	5.6
Fourth	7	4.7		
Fifth	1	.7		
Sixth	2	1.3		
<b>Generation</b>				
1	7	4.7	4	11.1
1.5	20	13.3	3	8.6
2	116	77.3	28	77.8
3	4	2.7	1	2.8
4 and above	3	2		

ensure that participants were able to accurately rate the bilinear acculturation level of their sibling.

**Sibling Pairs Recruitment Criteria.** In the second recruitment effort, pairs of siblings were recruited and the criteria were as follows: a) the sibling pair was between 16 to 29 years old; b) both siblings were self-identified as Vietnamese or Chinese; c) they were biological siblings; and d) they had resided together for at least 10 years of their lives through childhood and adolescence.

### **Recruitment Method**

**Main Sample.** Participants were recruited through several methods in order to obtain the target sample size. Initially, participants were recruited through the University of Windsor's computerized Participant Pool system in the Department of Psychology. The following list of screening questions were submitted to the Participant Pool in order to target participants who met the study criteria: 1) Are you Vietnamese or Chinese?; 2) Are you between the ages of 18 and 29?; and 3) Do you have a sibling who is between 16 and 29 years old? The study was posted on the Participant Pool website where participants signed up for either a paper-and-pencil or web survey.

Participants were also recruited through contacting the departments of Science, Business, Education, Social Science and Humanities at the University of Windsor. These departments were requested to forward a recruitment email to their undergraduate students. As well, organizers or administrators of community cultural clubs and organizations at the University of Windsor, within the city of Windsor, across the Ontario region, and across Canada were contacted via e-mail and mail to request their assistance in promoting the study to their members. Mailed correspondence included a letter of request for recruitment and recruitment flyers (see Appendix C). Participants were also recruited through contacting the administrators of groups on the networking site, Facebook, and requesting that a recruitment message be posted on the group wall and sent to the group members through Facebook messaging (see Appendix D). The groups contacted had a specific focus on Vietnamese and Chinese Canadians.

Lastly, participants were recruited through the "snowball" technique. In this technique, the researcher's personal contacts with individuals who met the inclusion criteria were contacted via e-mail inviting them to participate in the study. These

participants and those obtained from other recruitment methods were asked to forward the study's recruitment information to their personal contacts.

**Sibling Pairs Sample.** In the initial phase of data collection, sibling pairs were recruited by giving participants from the main sample the option to recruit their sibling to participate. Participants were asked to create a unique code that they would then pass on to their siblings who would record this code onto their surveys. This was to allow the researcher to match up the sibling's responses for the sibling pairs data set. However, only three participants indicated in their surveys that they would recruit their siblings and none of the siblings participated in the study. This necessitated a change to the original recruitment procedure to directly recruit sibling pairs. To recruit sibling pairs, the administrators of groups on the social networking site, Facebook, were contacted and were requested to post a recruitment message on their group wall and sent to group members via Facebook messaging (see Appendix D). Sibling pairs were also recruited through the "snowball" technique described above.

### **Compensation**

**Main Sample.** Participants recruited through the University of Windsor's Participant Pool were compensated with one bonus mark towards their final grade in a participating psychology course of their choice. Participants recruited through the other methods noted above were given the option to enter a draw for one of twelve \$25 gift cards to Chapters bookstore or Cineplex Odeon theatre.

**Sibling Pairs Sample.** The incentive for recruiting sibling pairs was modified twice throughout the recruitment process, which speaks to the difficulty of recruiting from this population. Initially, the incentive for participating was a chance to enter a draw for one of two iPod Nano devices. After several months of low participation rates, the incentive was modified to the following: an incentive of \$10 for each sibling was offered if both siblings completed the study and if only one sibling completed the study, that sibling received \$5 while the other sibling was given the option to enter the above draw if they discontinued the study without completing the survey.

### **Instrumentation**

To address the research questions of the present study a battery of self-report questionnaires along with open-ended questions were administered to participants of both

the main sample and the sibling pairs sample. The self-report questionnaires are presented in Table 4.

**Demographic Questionnaire (see Appendix A).** A demographic questionnaire was administered first to each participant. The questionnaire included questions pertaining to the following: age, birth date, gender, educational attainment, current grade point average, occupation, income level, religion, marital status, living arrangement (with parents, with siblings, on one's own, in the same city as parents and/or siblings), country of birth, age of arrival to Canada, number of siblings in the household, birth order, ethnicity, and generational status in Canada.

**Sibling Demographic Questionnaire (see Appendix B).** Participants were also administered a sibling demographic questionnaire in which they were asked to identify a biological sibling between the ages of 16 and 29 years old who they perceived as significantly different from them with respect to affiliation to, identification with or involvement with either the heritage culture or Canadian culture. They were asked to answer questions regarding this sibling's age, gender, educational attainment, living arrangement, number of years lived/living with sibling, generational status, birth order, and ethnicity. This information was used to determine sibship gender, confirm eligibility, and assure accuracy of information. Initially, sibling pairs data were collected by having individual participants recruit their sibling to participate in the study. However, very few participants opted to recruit their sibling and thus, this portion of the survey was subsequently removed.

### **Predictor Variables**

**Vancouver Index of Acculturation (VIA; Ryder et al., 2000).** The VIA is a 20-item bilinear measure of acculturation. It assesses acculturation on the dimensions of values, social relationships, and traditions (Ryder et al., 2000) on two independent subscales of Heritage and Mainstream acculturation. Respondents are asked to rate their degree of agreement on items pertaining to six issues of acculturation (e.g., friend preferences, cultural activities) in a likert-type format. Responses range from 1 (strongly disagree) to 9 (strongly agree). Items are presented in pairs with one item pertaining to heritage acculturation and the other pertaining to mainstream acculturation. For example,



Table 4 *Instrumentation*

<b>Measures</b>	<b>Variable</b>	<b>Items</b>	<b>Range</b>	<b>Scale</b>
Vancouver Index of Acculturation (VIA)	Canadian Acculturation Heritage Acculturation Perceived Canadian Acculturation Perceived Heritage Acculturation and heritage)	10 items per dimension (Canadian and heritage)	10 – 90; Total	9-point Likert-type; Strongly Agree (1) to Strongly Disagree (9)
Adult Sibling Relationship Questionnaire – short (ASRQ-short)	Sibling Conflict Sibling Warmth Sibling Rivalry	17 items 18 items 12 items	1 – 5; Total 1 – 5; Total 0 – 2; 3 minus average	Sibling conflict and warmth: 5-point Likert-type; Hardly at all (1) to Extremely Much (5); Average score Rivalry: 5-point Likert type; Self-favoured (1) to Sibling favoured (5);
The Center for Epidemiologic Studies Depression Scale (CES-D)	Depression	20 items	0 – 60; Total	4-point Likert-type; Rarely or none of the time, less than one day (1) to Most or all of the time, 5-7 days (3)
Brief Symptom Inventory-18 (BSI-18)	Symptom Distress	18 items	0 – 72; Total	5-point Likert-type; Not at all (0) to Extremely (4)
Cultural Adjustment Difficulties Checklist (CADC) – cultural stress and intercultural competence concerns items	Intercultural adjustment difficulties	32 items	32 – 192; Total	6-point Likert-type; A very accurate description of you (1) to a very inaccurate description of you (6)
General Ethnicity Questionnaire (GEQ-language)	English Language Proficiency Heritage Language Proficiency	13 items per language subscale	13 – 65; Total per subscale	5-point Likert-type; Very much (1) to not at all (5)
Demographic Questionnaire	Control Variables Descriptive Data			

“I would be willing to marry a person from my heritage culture” is followed by the item, “I would be willing to marry a North American person”. The VIA yields two scores, one for heritage acculturation and one for mainstream acculturation with higher scores on each subscale reflecting greater orientation toward the respective culture.

The reliability and validity of the 20-item VIA was assessed by Ryder et al. (2000). The VIA was tested on an undergraduate sample consisting of 204 Chinese students, 70 East Asian students, and 140 students of miscellaneous cultural backgrounds (non-English speaking and non-East Asian). The heritage subscale of the 20-item VIA demonstrated good internal consistency with all three samples ( $\alpha = .91, .92, \text{ and } .91$ , respectively) and had high mean interitem correlations ( $r = .52, .53, \text{ and } .51$ , respectively). As well, the mainstream subscale produced good internal consistency ( $\alpha = .89, .85, \text{ and } .87$ , respectively) and high interitem correlations ( $r = .45, .38, \text{ and } .44$ , respectively). Further, both the heritage and mainstream subscales of the VIA demonstrated concurrent validity as evidenced by significant correlations with length of residence, length of education in host country, generational status, intentions to return to country of origin (sojourner status), English as first or second language, western identification, and SL-ASIA.

In the present study, slight wording changes were made to the items on the VIA to reflect the demographics of the targeted participants as recommended by Ryder et al. (2000). The phrase “North American” in the original scale was replaced with “Canadian”. In addition, participants were asked to rate their own acculturation level using the VIA as well as the acculturation levels of one of their siblings. To do so, the participants were given specific instructions to complete one VIA for themselves (VIA-self) and one VIA from their sibling’s perspective (VIA-sibling). In keeping with the main focus of the study and based on previous research (Pyke, 2005), participants were asked to identify a sibling who is most different from them in terms of acculturation level.

Perceived acculturation discrepancy scores used in the present study were generated by subtracting the participant’s VIA-self score from the VIA-sibling score resulting in two perceived acculturation discrepancy scores (Canadian and heritage). For research question 4, actual acculturation discrepancy scores were calculated by taking the difference of the VIA-self scores of each sibling pair resulting in two actual perceived

acculturation scores (Canadian and heritage). Previous studies have used the subtraction method to assess perceived acculturation of family members and perceived acculturation discrepancy between family members with the VIA (Chong, 2007; Shirar, 2002). For example, Shirar (2002) examined the relation between bilinear acculturation and psychological outcomes in a sample of 152 first generation Chinese immigrant youth. The participants were administered two versions of the VIA, one asking them to rate themselves and the other asking them to rate their parents. From this method, Sharir (2002) derived four VIA subscale scores: VIA Self-Canadian, VIA Self-Chinese, VIA Parent-Canadian, and VIA Parent-Chinese. The author found high internal consistency for the four subscales of .85, .80, .82, and .81, respectively, as well as high mean inter-item correlations (.49, .43, .43, .45, respectively).

In the present sample of Vietnamese and Chinese young adults, the internal consistency of the VIA in the main data set was good with  $\alpha = .82$ . The Cronbach alpha was also good for the Heritage acculturation subscale (HA-self),  $\alpha = .82$ , and the Canadian acculturation subscale (CA-self),  $\alpha = .85$ , respectively.

**The Short-form Adult Sibling Relationship Questionnaire (ASRQ-S; Lanthier, Stocker, & Furman, 2001).** The ASRQ-S is a 47-item questionnaire assessing three factors of the sibling relationship quality: Warmth, Conflict and Rivalry. This measure is a shortened version of the 81-item Adult Sibling Relationship Questionnaire (ASRQ, Stocker et al., 1997). The ASRQ-S was developed by taking the top three scales that loaded highest on the Warmth and Conflict factors across four different samples. The samples were unspecified by the authors. The Warmth factor is comprised of intimacy, emotional support, and knowledge while the Conflict factor is comprised of antagonism, dominance and quarrelling. The Rivalry factor scale was not changed from the original version and is comprised of paternal- and maternal- rivalry scales. The Warmth and Conflict scales ask participants to rate the degree to which each statement characterizes the sibling relationship on a Likert scale ranging from 1 (hardly at all) to 5 (extremely much). The Rivalry factor items ask participants to rate the degree to which siblings are favoured by parents in different situations on a Likert scale ranging from 1 (participant is usually favoured) to 5 (sibling is usually favoured). The scoring for the Warmth and Conflict factors is unit weighting while the Rivalry factor is scored by

taking the absolute value of deviations from the mid-point of the scale resulting scores ranging from 0 (no rivalry) to 2 (maximum rivalry).

The authors reported psychometric properties. The authors reported comparably high alpha coefficients for the shortened Warmth ( $\alpha = .96$ ), and Conflict ( $\alpha = .93$ ) factors in a sample of 356 female and 189 male, mostly Caucasian (90%) participants aged 17 to 45 (mean age of 19.48 years). The alpha coefficient for the Rivalry factor was  $\alpha = .88$  in a sample of 383 young adults. The authors did not report test-retest reliability data for the ASRQ-S. This measure was used to assess sibling relationship quality on three dimensions: conflict, warmth and rivalry. The internal consistency of the ASRQ-S in the present sample was good with  $\alpha = .91$ . The internal consistency scores of the conflict ( $\alpha = .91$ ), warmth ( $\alpha = .95$ ) and rivalry ( $\alpha = .81$ ) subscales were also good.

### **Outcome Variables**

**The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977).** The CES-D is a 20-item self-report measure that was originally developed to screen for depression in a non-clinical population. Respondents are asked to rate the frequency with which they experienced each listed feeling or behaviour over the past week on a four-point Likert-type scale, from 0 (rarely or none of the time, less than 1 day) to 3 (most or all of the time, 5-7days). The possible range of scores is from 0 to 60. The items of the scale are symptoms associated with depression. The authors of the study compiled a list of items previously developed for various depression scales. They identified the major elements of depressive symptomology from factor analysis studies and clinical reports. These symptoms included depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. A few items were selected to represent each component of depression. Such items include, "I was bothered by things that usually don't bother me" and "I felt that I was just as good as other people". This measure was used to assess psychological adjustment in the present study. Sixteen items were reverse coded so that higher scores represented better psychological adjustment.

The authors investigated the psychometric properties of the scale on both clinical and non-clinical samples. It has also been translated into different languages and has been used with different ethnic groups including Chinese, Korean and Mexican American

groups (Garcia & Marks, 1989; Juang, Syed, & Takagi, 2007; Noh, Avison, & Kaspar, 1992). The internal consistency for the CES-D is acceptable ranging from .84 to .85 in a general population, and .90 in a clinical population (Radloff, 1977). The test-retest reliability for the CES-D was within the low to moderate range ( $r = .32$  to  $.67$ ) over a period of 2 to 8 weeks (Radloff, 1977). The test authors suggested that these lower coefficients were the result of variability in time intervals between first and second testing sessions (a few weeks to a few months), variable data collection methods (i.e., in-home interview versus mail-back), and negative life events. Juang et al. (2007) used the CES-D in a sample of 166 Chinese American adolescents aged 13 to 17 years old and reported a Cronbach's alpha of .84. The internal consistency score of the CES-D in the present sample was  $\alpha = .92$ .

**Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000).** The BSI-18 is an 18-item self-report questionnaire and is a shortened version of the Brief Symptom Inventory (Derogatis, 1983; Derogatis, Rickels, & Rock, 1976), which was itself based on the Symptom Checklist-90 (Derogatis, 1983). The scale was developed to screen for psychological distress and psychiatric disorders. This measure is suited for the sample of the present study in that it includes physical complaints in addition to psychological and emotional symptoms. Studies have noted that Asians tend to express distress in physical symptoms rather than emotional or psychological symptoms (Kleinman, 1986 in Vega & Rumbaut, 1991). The BSI-18 asks participants to rate their degree of distress regarding a range of symptoms over the past week. Items are rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The BSI-18 is comprised of three dimensions: Somatization (SOM), Depression (DEP) and Anxiety (ANX) each with six items. In addition, the measure provides an overall score of psychological distress based on a total of all 18 items: the Global Severity Index (GSI).

Derogatis (2000) reported adequate internal consistency for the GSI ( $\alpha = .89$ ) as well as for the three dimensions of SOM ( $\alpha = .74$ ), DEP ( $\alpha = .84$ ) and ANX ( $\alpha = .79$ ). As well, the BSI-18 has been successfully used with an Asian Canadian young adult population. Chong (2007) found high internal consistency for SOM ( $\alpha = .83$ ), DEP ( $\alpha = .88$ ) and ANX ( $\alpha = .81$ ) as well as for the GSI ( $\alpha = .92$ ). Similarly, Liu and Iwamoto (2006) used the BSI-18 in a sample of 192 Asian American male adults and found high

internal consistency using the GSI ( $\alpha = .91$ ). Given that the aim was to examine influences on general psychological adjustment, only the GSI was used for analyses in the present study. The internal consistency of the total BSI-18 in the present sample was  $\alpha = .94$ .

**Cultural Adjustment Difficulties Checklist (CADC; Sodowsky & Lai, 1997).**

The CADC is a 59-item measure used to assess acculturation related stressors. The scale consists of items relating to majority-minority conflict-related problems, alienation toward one's own cultural reference group, and issues of self-efficacy in White-dominant social context. Respondents are asked to rate on a Likert-type scale how accurately a statement describes them. Responses can range from 1 (*a very inaccurate description of you*) to 6 (*a very accurate description of you*). The CADC consists of two subscales: acculturative distress and intercultural competence concerns. The acculturative distress subscale is comprised of 19 general stress items measuring behaviour, affect, psychosomatic symptoms, and academic and career-related concerns and 16 cultural stress items measuring cultural conflicts with host and ethnic group members, evaluations of the ethnic group, gender role confusion, feelings of anger towards host and ethnic group members, and struggles with feeling belonging to the host and ethnic groups. The intercultural competence concerns subscale is comprised of 24 items measuring concerns about social competence, academic and career competence and cultural competence. Higher scores on the CADC indicate greater cultural adjustment difficulties.

The CADC was developed with a sample of 200 Asian immigrants and boasts good psychometric properties. The sample consisted of students, faculty, staff and university-affiliated professionals from the University of Nebraska-Lincoln. The participants ranged in age from 20 years to 60 years with a median age of 27 years. The ethnic composition of the sample was Chinese ( $N = 55$ ), Asian Indian ( $N = 52$ ), Vietnamese ( $N = 32$ ), Korean ( $N = 21$ ), Japanese American ( $N = 18$ ), other Asian American ( $N = 13$ ), and Filipino ( $N = 9$ ). The internal consistency reliability of the full scale was good ( $\alpha = .92$ ) as were the coefficient alphas of the two subscales ( $\alpha = .90$  and  $\alpha = .88$ , respectively). In addition, the two subscales were positively correlated ( $r = .34$ ).

Previous studies have successfully used the CADC in different populations and report adequate psychometric properties. Reynolds and Constantine (2007) investigated

the relation between cultural adjustment difficulties and career development issues in a sample of 261 African (18.4%), Asian (37.5%) and Latin American (44.1%) international students attending a predominately European American university in the northeastern part of the United States. They found that the CADC had adequate internal consistency reliability for the acculturative distress ( $\alpha = .76$ ) and the intercultural competence concerns ( $\alpha = .73$ ) subscales.

Thirty-one items from the cultural stress and the intercultural competence concerns subscales of the CADC were utilized in the present study to assess intercultural adjustment difficulties of the participants. Higher scores represent more intercultural adjustment difficulties. The internal consistency of the CADC items employed in the present study was good with  $\alpha = .88$ . The Cronbach's alpha of the cultural stress items ( $\alpha = .84$ ) and the intercultural concerns subscale ( $\alpha = .85$ ) were also good.

### **Control Variables**

In addition to items from the demographic questionnaire, an additional self-report questionnaire was administered to assess English and Heritage (Vietnamese and Chinese) language use and proficiency.

**General Ethnicity Questionnaire – Language Subscale (GEQ; Tsai, Ying & Lee, 2000; Kang, 2006).** The GEQ is a measure of acculturation and consists of two versions, one to assess acculturation towards American culture and one to assess acculturation towards Chinese culture. It is comprised of 38 items for each version, 13 of which assess language proficiency and competence within each cultural domain. Of these 13 language items, 4 items address language proficiency (e.g., “How fluently do you speak English/Chinese?”), and 9 items address frequency of language use within different domains (e.g., “How much do you speak English/Chinese at home?” Respondents are asked to rate their responses on a 5-point Likert scale ranging from 1 (very much) to 5 (not at all). The GEQ shows good psychometric properties in Asian American populations. Tsai et al., (2000) reported high internal reliabilities for both the Chinese ( $\alpha = .92$ ) and American ( $\alpha = .92$ ) versions of the GEQ in a sample of 353 Chinese American college students. The authors reported somewhat lower than typical test-retest reliability coefficients ( $r = .62$  for Chinese version,  $r = .56$  for American version).

Tsai et al. (2000) found that the GEQ items loaded significantly on six factors, one of which was a Language factor that consisted mainly of the 13 language items of both American and Chinese versions. Kang (2006) used the 13 items of the GEQ to assess language competence in a sample of 489 Asian American students and found high alpha coefficients for both versions ( $\alpha = .89$  for American Language and  $\alpha = .91$  for Asian Language). Thirteen items of the GEQ were used in the present study to assess English language competence and Heritage language competence. The language items of the Chinese version of the GEQ was modified to replace “Chinese” with “Heritage” for the present sample. In the present study, Heritage and English language use and proficiency scores were included as control variables. Items on the GEQ were reverse scores such that higher scores represent higher language proficiency. The internal consistency score of the GEQ-English subscale was good with  $\alpha = .90$  and the internal consistency score for the GEQ-heritage subscale was acceptable with  $\alpha = .76$ .

### **Qualitative Data**

As noted in the previous chapter, the qualitative component of the present study is intended to provide contextual meaning to the quantitative portion of the study, hence, a concurrent mixed-method nested design was employed (Hanson et al, 2005). As well, qualitative data can help to explore emerging areas of research, such as the present study on sibling relationship and acculturation, where theories and models are presently lacking. Hence, qualitative data were collected in the present study using open-ended questions to supplement the depth of this research. To this end, eight open-ended questions were administered to all participants from both samples in the study. Only the qualitative data from the main sample were used in the qualitative analysis.

### **Open-Ended Questions**

- 1) Describe in what ways your sibling is different from or similar to you in terms of your affiliation and identification with Vietnamese or Chinese culture.
- 2) Describe in what ways your sibling is different from or similar to you in terms of your affiliation and identification with Canadian culture.
- 3) Talk about how differences or similarities between you and your sibling on matters of Heritage (Vietnamese or Chinese) or Canadian culture have impacted your relationship.



- 4) How has your relationship with your sibling changed from childhood to young adulthood? Include a brief description of the nature of your relationship in childhood and compare it to your relationship with your sibling today.
- 5) Describe how your sibling has influenced your sense of well-being or ability to cope with life's stresses.
- 6) How has your sibling influenced your ability to deal with living in two different cultural contexts, the Canadian culture and the Vietnamese or Chinese culture?
- 7) Describe any other important issues or experiences that are relevant to cultural differences between you and your sibling, and your sibling relationship that you would like to add.
- 8) Where do you consider home, Vietnam, China, Canada or elsewhere? Please elaborate.

### **Procedure**

**Use of Web-based Survey.** Birnbaum (2004) noted several advantages to the use of web-based data collection in research. The author noted that web-based data collection allows researchers to obtain a large sample size and more diverse samples beyond typical convenience samples of college or university students. Others have commented on the rapidly growing numbers of individuals, groups and communities that are accessing the internet for various purposes of communication and information seeking (Nie, Hillygus, & Erbring, 2002; Wright, 2005). This allows researchers to access a highly diverse population for research across many subject areas (Wellman, 1997; Wellman & Haythronthwaite, 2002). Further, Wright (2005) noted that web-based data collection is time saving for both the researcher and the participant. The author identified time savings in terms of allowing the researcher to engage in other research related tasks while the survey is administered via the internet and in terms of eliminating the need to manually input raw data from paper-and-pencil surveys into a statistical analysis program like SPSS or SAS. Wright (2005) also noted time savings for participants who are able to complete surveys at their convenience rather than having to make appointments to meet with the researcher in person to complete surveys.

The advantages of web-based data collection was evident in the present study given that Vietnamese young adults, in particular, represent a very small proportion of

the Canadian ethnic demographic and they reside in various cities and towns across Canada. Thus, web-based survey was a highly valuable tool to access this group as compared to the more traditional paper-and-pencil survey method. In addition, an aim of the present study was to obtain responses from sibling pairs, which can be difficult if siblings live apart from each other. Employing web-based survey allowed for recruitment of siblings living in different cities across Canada.

However, a number of criticisms of web-based data collection have also been raised in the literature, some of which were addressed in the present study. The problem of multiple submissions is a realistic concern for researchers using web-based data collection (Gosling, Vazire, Srivastava, & John, 2004). To address this concern, Birnbaum (2004) and Gosling and colleagues (2004) suggest a number of strategies to decrease the likelihood of multiple submissions in the final database. Two of the strategies were employed in the present study including instructing participants to complete the survey once only; informing participants that rewards or entrance into a drawing for a reward would only be provided for the first submission; informing participants that they would not be provided with individual feedback regarding their performance at the end of their participation; and visually inspecting all item responses on surveys, including demographic questionnaires, to remove duplicate submissions. While removing identical internet protocol (IP) addresses was a recommendation made by the authors it was not employed in this study due to technical restrictions.

Web-based surveys tend to have higher drop-out rates than in-person administration of surveys (Birnbaum, 2004). To address this problem in the present study, participants were asked to complete the demographic questionnaire early in the administration, which has been suggested to promote social pressure to complete the study and wean out participants who are more likely to drop out later in the study (Birnbaum, 2004). As well, to cut down on possible distractions during participation, participants were instructed to complete the survey in a quiet room. The problem of low response rates in web-based data collection was addressed in the present study by sending recruitment correspondence once every month to prospective participants (in the snowball technique), administrators of Facebook groups, and organizers and administrators of cultural clubs and organizations. In addition, after completing the web-

survey, participants were asked to forward recruitment information to eligible friends and family to increase response rates. Lastly, a major criticism of web-based data collection is that it is not a random method and that participants differ fundamentally from those who do not participate via the web (Stanton, 1998; Thompson, Surface, Martin, & Sanders, 2003). While the researcher in the present study attempted to address this issue by offering paper-and-pencil administration of surveys, few participants opted for this format. This was not deemed as a disadvantage in the present study, but rather as a reflection of the pervasiveness and importance of the Internet to this particular population.

### **Web-based Survey Procedure: Main Sample**

Only the web-based survey procedure is described here because only three participants opted for the paper-and-pencil survey, which were subsequently excluded from analyses due to ineligibility to participate. Participants were provided with a website address, userID and password to access the web survey. Upon accessing the survey, participants were asked to fill out a short screener questionnaire to determine their eligibility for participating in the study. The screener questionnaire included the following questions: 1) Are you Vietnamese or Chinese?; 2) Are you between the ages of 18 and 29 years old?; 3) Do you reside in Canada?; 4) Do you have a biological sibling who is between 16 and 29 years of age; 5) Were you raised with your sibling? If participants responded negatively to any of these questions the study was discontinued and an explanation was provided. If the participants met all of the criteria then the informed consent form was sent to them outlining the voluntary nature of the survey and the potential benefits and risks of participating in the study (see Appendix E). As well, the consent form explained that their participation was confidential, but not anonymous. The potential risks of participating in the study included thinking about acculturation experiences, their own and in comparison to their identified sibling, thinking about sibling relationship experiences, and identifying various psychological and somatic symptoms, which may elicit negative feelings for some participants. The potential benefits of participating included gaining self-awareness and insight. Participants were asked to indicate their consent to participate in the study by clicking a button marked “I

agree". They were also given the option to provide an e-mail address in order that an electronic copy of the consent form could be sent to them for their records.

Next, participants were asked to create a unique password that they could use to save the survey and complete it at a later date. The survey was then administered in the following order: demographic questionnaire, sibling demographic questionnaire, VIA, VIA-sibling, CES-D, BSI-18, ASRQ, GEQ-English, GEQ-Heritage Language, CADC, and the open-ended questions. Each measure was presented on a separate page and participants were asked to submit each measure by clicking on a submit button before they are given access to the next measure. On each page, the participants were given the option to save and exit the survey (to be completed at a later time) or to voluntarily withdraw from the study.

At the end of the web-based protocol, all participants were prompted to a page with information regarding compensation for participation. They were asked for their e-mail addresses in order to distribute the compensation. They were informed that this information was not connected with their responses. Participants recruited through the University of Windsor Participant Pool were given 1 bonus mark towards their final grade in a psychology course of their choice. All other participants were given the option of entering a draw as described above. The participants were then prompted to a page with information on referral numbers to on-campus and community counseling services.

The draw took place in September of 2010 and winning participants were contacted via e-mail for their gift card preference and their mailing addresses. They were informed that their mailing addresses would be securely kept in hard copy format in a locked filing cabinet and would not be distributed to third parties. After the gift cards were distributed, the mailing addresses were destroyed.

### **Web-based Survey Procedure: Sibling Pairs Sample**

Sibling pairs who were interested in participating contacted the researcher via e-mail and provided their email addresses. The sibling pair was assigned a unique code to be entered into the survey in order for their responses to be matched for data analysis and allowed them to complete the survey separately. They were also sent the survey website address and the userID and password to access the survey. The participants were prompted to read the informed consent form outlining the voluntary nature of the survey

and the potential benefits and risks of participation in the study. As well, the consent form explained that their participation was confidential, but not necessarily anonymous (see Appendix F). Participants were asked to indicate their consent to participate in the study by clicking a button marked “I agree”. They also had the option of providing an e-mail address to receive an electronic copy of the informed consent form for their records. Participants were then prompted to enter their unique code and create a password in order to access the survey to complete at a later time. Next, participants were administered the survey battery in the same order and manner as for the participants from the main data set. Participants who discontinued their participation were given the option to enter a draw for the gift cards as described above, after which, they were prompted to a page containing referral information to on-campus and community counseling services.

Participants completing the survey were prompted to provide their e-mail addresses in order for them to be contacted to receive their monetary compensation. They were then prompted to a page containing referral information to on-campus and community counseling services. When data collection was complete, participants were contacted via e-mail to obtain their names and mailing addresses for the purposes of distributing their monetary compensation. This information was kept in hard copy format in a locked cabinet and destroyed after disbursement of the compensation.

### **Qualitative Data**

Responses to the eight open-ended questions included as part of the survey protocol served as the qualitative data. Only responses to the eight open-ended questions from the main sample were analyzed. Of the 150 participants, 133 cases provided responses to at least 1 of the 8 open-ended questions and these were utilized in the analysis. The 17 deleted cases had no responses to any of the eight open-ended questions.

The qualitative data were analyzed using thematic analysis (Attride-Stirling, 2001; Braun & Clarke, 2006). Thematic analysis is “the searching across a data set – be that a number of interviews or focus groups, or a range of texts – to find repeated patterns of meaning” (pg. 86; Braun & Clarke, 2006) and “focuses on identifiable themes and patterns of living and/or behavior” (Aronson, 1994). To perform thematic analysis appropriately for a given objective, Braun and Clarke (2006) indicate a number of decisions researchers must make to guide the analysis. These include defining a theme

(by frequency versus importance), identifying the unit of analysis (important features versus the content of the data set), method of identifying themes (inductive versus theoretical), the level of analysis (semantic versus latent), and epistemology (essentialist/realist versus constructionist).

The present analysis defined the prevalence of themes by their importance rather than by frequency of the themes appearing in the data set. Given the limited and confidential nature of open-ended questions in this study, participants' could not be further probed to clarify or elaborate on their responses. Thus, any comments made by participants to the open-ended questions were deemed to be important regardless of the frequency of that comment occurring in other cases. Because the main objective of the study was to gain a greater understanding of the relation between sibling acculturation discrepancy, sibling relationship quality and adjustment outcomes the analysis was conducted to identify specific features of the data set that reflected this objective.

Analysis of the data was conducted using a mix of both inductive and theoretical analytic procedures. In order to generate initial codes, the data set was first read and re-read several times to identify codes emerging from the data without specific focus on the study objective. Codes are defined as "a feature of data (semantic content or latent) that appears interesting to the analyst" (Braun & Clarke, 2006). Then, previous literature was examined for additional codes that were specific to the study objective. As the data set was re-read again during the coding process, where data items (excerpts from the data set) were collated within each code, codes were augmented or amalgamated to be more distinct from each other.

Themes were generated after the coding process using a semantic approach where only the explicit meaning of the responses was examined rather than theorizing latent themes from the data. The thematic analysis was also conducted from an essentialist/realist approach where "a unidirectional relationship is assumed between meaning and experience and language" (pg 85; Potter & Wetherell, 1987; Widdicombe & Wooffitt, 1995 secondary reference in Braun & Clark, 2006). That is, an understanding of the individual's motivation, experience and meaning is derived directly from their responses. This is in contrast to the constructionist approach where the qualitative data is

employed to theorize the socio-cultural contexts that produce the individual responses (Braun & Clark, 2006).

The open-ended responses were analyzed using the phases of analysis outlined by Braun and Clark (2006). First, the data set was created by amalgamating the individual responses into one table with all responses from each case in a separate row. The first reading of the data set involved generating notes and comments for each participant's responses and highlighting potential codes based on recurrence of similar topics and fidelity with the research aims in the present study. For example, some potential codes that emerged from the initial reading of the data included *food preferences*, *media preferences*, and *language use and proficiency*. The second reading of the data set involved generating a list of initial codes to be used for further analysis which included codes that were not necessarily recurrent throughout the data set such as *feeling pride in culture* and *parental influence*. The acculturation literature was examined to identify additional codes of noted importance and to compare codes generated from the second reading with those identified in the literature. For example, the qualitative study conducted by Pyke (2005) on sibling acculturation differences and family relations was reviewed to identify codes relating to sibling acculturation differences, sibling relations and family relations. The third reading of the data set involved coding of each data item (responses from each participant) using the list of codes generated during the first and second readings of the data set, and the literature review. Coding was completed manually using a word processing program, Microsoft Word, to create separate files for each code where excerpts of data items were collated and notes were kept in the margins. During each reading, notes and comments were generated in a separate file to assist with identifying themes later in the analysis. Coded excerpts were examined to determine coherence and relevance with the code. A second coder with experience in qualitative analytic procedures was enlisted to enhance the inter-coder reliability of coding. To do so, the second coder was asked to independently code 30 randomly chosen responses using the coding system. Reliability was calculated using the percentage agreement of presence approach described by Boyatzis (1998). Disagreements and discrepancies in coding between the author and the second rater were discussed. Codes were added, changed, or amalgamated based on discussions with the second rater. An inter-coder

reliability was obtained of 91% agreement on presence. Codes were then grouped to represent themes and sub-themes, and a thematic map or network was employed to assist with the process of grouping codes into sub-themes and themes (Attride-Stirling, 2001). Themes and sub-themes were then reviewed to ensure that they were consistent with the coded excerpts. The data set was re-read with the final codes and themes in mind to identify additional excerpts, to ensure that codes were accurate, to ensure that data excerpts were not missed, and to check that the themes were consistent with the data set. As themes were being reviewed, their definition and labels were continuously refined. Finally, appropriate excerpts were chosen to exemplify each theme.



## CHAPTER III

### Results

The relation between sibling acculturation differences, psychological adjustment and intercultural adjustment difficulties in Vietnamese and Chinese young adults was the main focus of this study. In addition, this study was designed to assess whether sibling relationship quality mediated or moderated the relation between perceived acculturation discrepancy and adjustment outcomes. Finally, differences between Vietnamese and Chinese participants on study variables were examined.

This chapter presents the results of data analyses based on quantitative and qualitative data. The results pertaining to research questions 1, 2 and 3, are presented first and the main sample ( $N = 150$ ) was employed for these analyses. The sibling pairs sample ( $N = 36$ ) was utilized in analyses for research question 4 and 5.

The quantitative analysis begins with reporting the results of principle components analysis of the CADC. Descriptive statistics based on the measures of the Centre for Epidemiologic Studies Depression Scale (CES-D), Brief Symptom Inventory-18 (BSI-18), Cultural Adjustment Difficulties Scale (CADC), the Adult Sibling Relationship Questionnaire-short (ASRQ) and the Vancouver Index of Acculturation (VIA) are also presented.

Reliabilities of the dependent, moderator/mediator, and independent measures are reported. Correlations were conducted to examine research question 1. Correlations between the dependent variables and a number of potential control variables were conducted to determine inclusion of control variables in subsequent analyses. Research question 1 was examined using Pearson product-moment correlations to investigate the associations between acculturation discrepancy and psychological adjustment and intercultural adjustment difficulties. Research question 2 was examined using four hierarchical multiple regressions to investigate the moderating effects of three dimensions of sibling relationship quality – conflict, warmth, and rivalry while controlling for a number of variables that might have confounding influences on the psychological adjustment and intercultural adjustment difficulties outcomes.

Research question 3 was tested using a one-way multivariate analysis of variance (MANOVA) on acculturation level, perceived sibling acculturation discrepancy, the three components of sibling relationship quality, psychological adjustment and intercultural adjustment difficulties, subsequent to which a series of univariate analysis of variance (ANOVA) tests and discriminant function analysis follow-up tests were performed. These analyses were conducted to test cultural group differences between Vietnamese and Chinese young adult participants in this study.

To examine research question 4, paired samples t-tests were conducted to investigate whether siblings misperceive acculturation discrepancies. Research question 5 was examined using Pearson product-moment correlation and William's test of significance of difference between dependent correlations to investigate whether perceived or actual acculturation discrepancy was more strongly associated with psychological adjustment and intercultural adjustment difficulties. Finally, thematic analysis was conducted on the qualitative data based on the participants' responses to the eight open-ended questions.

### **The Main Sample**

#### **Missing Data**

Data from the main sample of 150 participants were explored for missing data. The stochastic regression imputation method (deterministic regression imputation with an added random error component) was employed to replace missing values. It was noted that due to a technical error during the creation of the web-based survey, data from eight items of the Intercultural Competence Concerns subscale of the CADC were not recorded in the data set. Thus, imputation methods could not be employed. Instead, the available 32 items of the CADC Cultural Stress and Intercultural Competence Concerns subscales were analyzed in an exploratory principle components analysis to determine their validity and they were used to represent the dependent variable, intercultural adjustment difficulties, in the present study.

#### **Exploratory Factor Analysis of the CADC Items**

An exploratory factor analysis (EFA) was conducted using principle components analysis with oblimin rotation to assess the dimensions of 32 CADC items based on the current main sample ( $N = 150$ ). A direct oblimin rotation was employed because the

underlying factors are expected to be related. Of the 32 CADC items, 16 items are cultural stress items from the acculturative distress subscale of the CADC while 16 items are from the intercultural competence concerns subscale. Based on the Kaiser criterion of retaining eigenvalues of greater than 1 (Kaiser, 1970), the first extraction retained nine factors. The eigenvalues for the factors ranged from 1.04 to 7.01 and accounted for 64.2% of total variance. Multicollinearity was assessed by examining the determinant which was 1.91E-006 for this data, suggesting no multicollinearity. Bartlett's test of sphericity was significant (1810.45,  $p < .001$ ) suggesting that the data are appropriate for factor analysis. Similarly, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) statistic was .78 suggesting that the data are adequate for factor analysis. The individual KMO values were also examined on the diagonal of the anti-image correlation matrix to determine if any items should be removed from the analysis. Only one item ("feeling good about my abilities") had a KMO value on the diagonal of less than .5 suggesting that this item should be removed from the factor analysis (Field, 2005). Factor analysis was conducted without this item and an improvement in interpretation of solutions was found. As well, this item did not load on any factors for the two, three, or four factor solutions. Together, this supported the removal of this item from all subsequent analyses.

The scree plot was examined to determine the number of factors to retain (Cattell, 1966b) which suggested four factors be retained. The two, three and four factor solutions were examined. While a two factor solution was anticipated based on the scale from which these items were taken, a three factor solution emerged as the most interpretable solution for these data. The three factor solution accounted for 38.4% of the total variance of the CADC for this sample. An examination of the reproduced correlations residual matrix revealed that 49% of residuals were greater than .05 suggesting the three factor solution is a good model (Field, 2005). An examination of the pattern matrix reveals that of the 32 items, 13 items loaded on Factor 1, 8 items loaded on Factor 2 and 8 items loaded on Factor 3. Items 3 and 23 did not load on any of the three factors using a factor loading cut-off point of .40 (Stevens, 1992). However, if a factor loading cut-off of .32 is employed as suggested by Tabachnick and Fidell (2006), then items 3 and 23 would load on Factor 1 and have factor loadings of close to .40 (.38 and .37,

respectively). Thus, these items were retained in subsequent analyses due to conceptual significance. Item 16 was complex as it had a factor loading of .50 on Factor 1 and a factor loading of .41 on Factor 2. This item was retained on Factor 1 because the factor loading was higher on this factor. As well, item 16 had the lowest loading of the items on Factor 2 suggesting that it is the least pure measure of this factor (Tabachnick & Fidell, 2006). Further, item 16 is conceptually consistent with the items of Factor 1. That is, item 16 is from the Cultural Stress subscale of the original CADC measure. Thus, it was retained on Factor 1. Table 5 presents a summary of the principle components analysis with oblique rotation for the three factor solution excluding item 13.

All items loading on Factor 1 corresponded to the Cultural Stress subscale items of the CADC (except for one item which loaded on Factor 2) and factor loadings ranged from .37 to .72. The internal consistency of Factor 1 items (15 items) showed a Cronbach's alpha of .84. Items loading on Factor 2 and 3 corresponded to items from the Intercultural Competence Concerns subscale of the CADC. Items from Factor 2 related to intercultural competence concerns within the ethnic domain with factor loadings ranging from .43 to .78. The internal consistency of Factor 2 (8 items) showed a Cronbach's alpha of .78. Items from Factor 3 related to intercultural competence concerns within the White Canadian domain with factor loading ranging from .44 to .75. The internal consistency of this factor was a Cronbach's alpha of .80. These reliabilities are somewhat lower than those of the original CADC, which likely reflects that all CADC items were not employed in the present study.

In summary, the component structure of the 32 CADC items in this sample was somewhat different than the expected two factor structure indicated by the original CADC subscales. The authors of the original CADC found a two factor solution with one factor labeled Acculturative Distress and the other factor labeled Intercultural Competence Concerns. The Acculturative Distress subscale consisted of general stress and cultural stress items. In this sample, all 15 cultural stress items loaded onto one factor with the exception of one item (feeling anger towards members of one's own ethnic group), which loaded on both Factors 1 and 2. The remaining 16 items (8 items per factor) loaded onto two distinct factors each representing intercultural competence

Table 5

*Summary of Factor Loadings of CADC items for the Main Sample (N = 150)*

CADC item #	Cultural Stress	ICC in White Canadian Group	ICC in Own Ethnic Group
	Factors	1	2
20		.72	
17		.70	
26		.70	
25		.62	
30		.61	
32		.60	
15		.58	
6		.55	
16		.50	.41
19		.46	
4		.45	
14		.41	
9		.40	
3		.38	
23		.37	
18			.78
12			.69
27			.64
22			.55
31			.55
8			.50
28			.49
2			.43
10			.75
21			.69
29			.62
7			.57
1			.55
24			.54
5			.48
11			.44
*13			

*Note.* Cut-off = .32. All loadings were taken in absolute numbers. ICC = Intercultural Competence Concerns. \*Excluded item not loading on any factor.

concerns relating to the White Canadian group (Factor 2) and to one's own ethnic group (Factor 3). This differs from the original CADC Intercultural Competence Concerns subscale in that all items of the subscale were best represented in one factor. This suggests that intercultural competence concerns are differentiated by ethnic or cultural domain in this sample. One item (feeling good about one's abilities) did not load on any factor and was excluded from the analyses. As such, intercultural adjustment difficulties was represented by 31 CADC items (item 13 removed) in this study. The internal consistency of this scale has a Cronbach's alpha of .88.

### **Reliabilities of the Measures of the Main Study Variables**

The reliabilities of the measures used to assess the main variables in this study were examined. For the present participants, the Cronbach's alpha for Heritage subscale of the VIA was .85 which is somewhat lower than the values reported by Ryder et al. (2000) which ranged from .91 to .92. The Cronbach's alpha for Canadian subscale of the VIA-self was .82 in this sample, which was similar to those reported by Ryder et al. (2000), which ranged from .85 to .89. For the main data set, the Cronbach's alpha for participants' sibling ratings on the heritage VIA-sibling was good at .91 and for the Canadian VIA-sibling was .86.

The internal consistency reliability of the two measures comprising the dependent variable of Psychological Adjustment was good with Cronbach's alphas of .92 for CES-D and .94 for BSI-18. The Cronbach's alpha for the total CADC (31 items) was .88 while a value of .85 was obtained for the Intercultural Competence Concerns subscale and a value of .84 for the Cultural Stress subscale. These values are somewhat lower than those reported by Sodowsky and Lai (1997) of .92 for the total CADC (58 items), .90 for the Acculturative Stress subscale and .88 for the Intercultural Competence Concerns subscale; this may be due to the CADC items that were not included in analyses due to technical error during data collection (see Missing Data above). The internal consistency reliability for the full scale ASRQ and the three subscales (conflict, warmth, and rivalry) were .88, .91, .95, and .81, respectively. Table 6 displays the Cronbach's alphas for each measure and their corresponding subscale.

Table 6

*Reliabilities of Measures and Subscales for the Main Data Set (N = 150)*

Measures	Cronbach's Alpha	# of items
VIA-self total	.82	20
VIA-self Canadian Acculturation	.82	10
VIA-self Heritage Acculturation	.85	10
VIA-sibling total	.82	20
VIA-sibling Canadian Acculturation	.86	10
VIA-sibling Heritage Acculturation	.91	10
ASRQ-total	.88	47
Conflict subscale	.91	17
Warmth subscale	.95	18
Rivalry subscale	.81	12
CES-D	.92	20
BSI-18	.94	18
GEQ Language – Heritage	.90	13
GEQ Language - English	.76	13
CADC total (without item 13)	.88	31
Cultural Stress subscale	.84	15
Intercultural Competence Concerns	.78	8
in White Canadian group		
Intercultural Competence Concerns	.80	8
in own ethnic group		

### **Perceived Sibling Acculturation Discrepancy Scores**

Two perceived sibling acculturation discrepancy scores were created from the VIA-self and VIA-sibling scores using the subtraction method (Birman, 2006; Cespedes & Huey, 2008; Merali, 2002). The perceived Canadian sibling acculturation discrepancy (CA-DIS) score was obtained by taking the absolute value of the difference between the Canadian VIA-self (CA-self) score from the Canadian VIA-sibling (CA-sibling) score. The perceived Heritage sibling acculturation discrepancy (HA-DIS) score was obtained by taking the absolute value of the difference between the Heritage VIA-self (HA-self) score from the Heritage VIA-sibling (HA-sibling) score.

### **Psychological Adjustment Composite Score**

The CES-D and BSI-18 total scores were combined to create a composite score that represented psychological adjustment in order to improve reliability (Ghiselli, Campbell, & Zedeck, 1981; Mehta, 1998). Higher scores represent better psychological adjustment. The normality of the CES-D and BSI-18 scores was first examined by skewness scores. Both scales were found to be normally distributed. The CES-D was significantly correlated with the BSI-18,  $r(148) = .73, p < .01$  in the positive direction. Scores were standardized (converted to T-scores with a mean of 50 and a standard deviation of 10) and summed to create one composite score to represent the dependent variable of psychological adjustment. The resulting score range is from 31.14 to 125.84 with higher scores representing better psychological adjustment.

### **Descriptive Statistics of Study Measures – Main Sample**

Table 7 displays the means and standard deviations of the dependent variables, moderator variables, independent variables, and control variables. A series of t-tests revealed that male ( $M = 104.64, SD = 15.55$ ) and female ( $M = 98.53, SD = 19.27$ ) participants did not differ significantly on psychological adjustment scores,  $t(148) = -1.73, p = .09$ . As well, male ( $M = 79.30, SD = 20.18$ ) and female ( $M = 81.68, SD = 19.18$ ) participants did not differ significantly on intercultural adjustment difficulties scores,  $t(148) = .64, p = .52$ . Similarly, t-tests revealed that Vietnamese ( $M = 95.45, SD = 21.11$ ) and Chinese ( $M = 102.05, SD = 16.23$ ) participants did not differ on psychological adjustment scores,  $t(135) = -1.93, p = .06$ . As well, Vietnamese ( $M = 84.18, SD = 18.14$ )



Table 7

*Means and Standard Deviations for the Key Variables in the Study - Main Data Set*

Variable	<i>M</i>	<i>SD</i>
Predictor Variables		
Perceived Canadian Acculturation Discrepancy	6.59	5.75
Perceived Heritage Acculturation Discrepancy	13.77	10.92
Moderator/Mediator Variables		
Sibling Conflict	2.46	.72
Sibling Warmth	2.89	.86
Sibling Rivalry	.81	.51
Criterion Variables		
Psychological Adjustment	100.00	18.58
Center for Epidemiologic Studies Depression Scale	42.13	11.29
Brief Symptom Inventory – 18	56.77	13.85
Intercultural adjustment difficulties	136.25	19.11
Cultural Stress subscale	38.18	10.58
Intercultural Competence Concerns subscale	42.93	12.45
Control Variables		
Years in Canada	20.79	3.47
Canadian Acculturation	71.29	9.71
Heritage Acculturation	63.99	13.29
English Language Proficiency	59.43	10.07
Heritage Language Proficiency	28.47	5.80

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*Note.*  $N = 150$

and Chinese ( $M = 79.71$ ,  $SD = 19.75$ ) participants did not differ on intercultural adjustment difficulties scores. No t-tests were performed based on different participation method as all participants completed the online survey. Similarly, no tests were performed for immigrant status as the majority of participants were Canadian citizens (97.3%).

The mean CES-D score in the present sample was 17.81 ( $SD = 11.34$ ) prior to reverse coding, and is comparable to that found in previous research. For example, Yen, Robins, and Lin (2000) found a mean CES-D score of 17.11 ( $SD = 9.90$ ) in a sample of 99 Chinese American college undergraduate students. The mean BSI-18 total score in the sample was 15.07 ( $SD = 13.95$ ) prior to reverse coding, and is lower than previous studies on Asian American male adults ( $M = 31.47$ ,  $SD = 6.46$ ; Liu & Iwamoto, 2006), but higher than previous studies on ethnic minorities in the United States ( $M = 8.24$ ,  $SD = 7.95$ ; Constantine & Flores, 2006). This suggests that the present sample reported somewhat fewer symptoms of psychological difficulties than previous studies.

The intercultural adjustment difficulties score was comprised of 31 items from the CADC (cultural stress items from the acculturative distress subscale and intercultural competence concerns subscale). The present sample had a mean intercultural adjustment difficulties score of 136.25 ( $SD = 19.11$ ). The mean score of cultural stress items was 38.18 ( $SD = 10.58$ ) and the mean intercultural competence concerns subscale score was 42.93 ( $SD = 12.45$ ). These scores are lower than previous studies (Reynolds & Constantine, 2007; Torres & Rollack, 2007; Wilton & Constantine, 2003). For example, Wilton and Constantine (2003) found a mean acculturative distress subscale score of 94.77 ( $SD = 21.80$ ) and a mean intercultural competence concerns subscale score of 72.55 ( $SD = 16.03$ ) in a sample of 190 Asian and Latin American university students in the United States. This suggests that the present sample reported fewer difficulties with intercultural adjustment than previous studies.

### **Research Question 1: What are the Relations between Perceived Sibling Acculturation Discrepancy and Adjustment?**

Pearson product moment correlations between Canadian and Heritage Sibling Acculturation Discrepancy (CA-DIS and HA-DIS), Psychological Adjustment and Intercultural Adjustment Difficulties were conducted to examine Research Question 1

(see Table 8). It was hypothesized that perceived Canadian acculturation discrepancy would be positively associated with psychological adjustment and associated with intercultural adjustment difficulties. Further, it was hypothesized that perceived heritage acculturation discrepancy would be negatively associated with psychological adjustment and associated with intercultural adjustment difficulties. Based on the correlational analyses, neither perceived Canadian acculturation discrepancy nor perceived Heritage acculturation discrepancy were significantly correlated with psychological adjustment or intercultural adjustment difficulties in this sample. Therefore, hypotheses 1a, 1b, 1c, and 1d were not supported.

**Research Question 2: Is Sibling Relationship Quality a Moderator or Mediator on the Relation between Sibling Acculturation Discrepancy and Adjustment Outcomes?**

This research question focuses on the potential moderating or mediating role of sibling relationship quality on the relation between sibling acculturation differences and psychological adjustment and intercultural adjustment difficulties outcomes, respectively. It was hypothesized that dimensions of sibling relationship quality will moderate or mediate the relation between perceived acculturation discrepancy (Canadian and heritage) and psychological adjustment and intercultural adjustment difficulties. Hence, hierarchical regression analyses were conducted to test the hypotheses.

**Choosing Control Variables**

In order to determine which variables to be included in the analysis for research question 2 as control variables, Pearson product moment correlations and a point-biserial correlation were first conducted to test the relation between these variables the dependent variable (i.e., psychological adjustment). The control variables included in these correlational analyses were years in Canada, generational status, gender, birth order, English language proficiency, Heritage language proficiency, Canadian acculturation level and Heritage acculturation level (see Table 8).

The correlational analyses showed that psychological adjustment was significantly positively correlated with years in Canada,  $r(148) = .16, p < .05$ , and Canadian acculturation level,  $r(148) = .20, p < .05$ . This suggests that participants who

Table 8

*Inter-correlations of Key Study Variables of the Main Data set (N = 150)*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. GEN	--														
2. Gender	.03	--													
3. YRS	.05	-.02	--												
4. Birthorder	.13	.01	-.21**	--											
5. EngLanPro	.23**	.02	.07	.01	--										
6. HerLanPro	-.14	-.09	-.23**	-.03	-.45**	--									
7. CA-self	-.01	-.05	.05	-.01	.20*	-.21*	--								
8. HA-self	-.11	-.06	-.06	.02	-.22**	.30**	.10	--							
9. CON	.15	.11	-.26**	-.02	-.03	.11	.06	.04	--						
10. WARM	-.03	.11	.13	-.15	-.05	.02	.20*	.12	-.04	--					
11. RIV	.13	-.06	-.03	.07	.09	-.03	.03	-.14	.32**	-.12	--				
12. HA-DIS	-.04	-.14	.08	-.06	-.05	-.10	.13	-.05	-.00	-.13	.22**	--			
13. CA-DIS	-.13	-.03	-.20*	.15	.10	-.09	-.13	-.17*	.10	-.20*	.04	.05	--		
14. ADJUST	.01	-.14	.16*	-.10	.06	-.10	.20*	.14	-.29**	.07	.16	-.01	-.07	--	
15. INTAD	.06	.05	.02	-.02	.23**	-.00	-.32*	-.24**	.20**	-.05	-.02	.08	-.03	-.42**	--

*Note.* \*  $p < .05$ , \*\*  $p < .01$ . GEN = generational status; YRS = years in Canada; EngLanPro = English language proficiency; HerLanPro = heritage language proficiency; CA-self = Canadian acculturation; HA-self = heritage acculturation; CON = sibling conflict; WARM = sibling warmth; RIV = sibling rivalry; HA-DIS = Perceived heritage acculturation discrepancy; CA-DIS = Perceived Canadian acculturation discrepancy; ADJUST = Psychological adjustment; INTAD = Intercultural adjustment difficulties.

resided in Canada longer and who reported high levels of Canadian acculturation were more likely to report better psychological adjustment.

Intercultural adjustment difficulties was negatively correlated with Canadian acculturation level,  $r(148) = -.32, p < .01$ , and heritage acculturation level,  $r(148) = -.24, p < .01$ , and positively correlated with English language proficiency,  $r(148) = .23, p < .01$ . These results suggest that participants who indicated higher levels of Canadian acculturation, higher levels of Heritage acculturation and more proficiency in English language reported fewer intercultural adjustment difficulties.

There were no significant correlations found between the dependent variables and Heritage language proficiency, gender, birth order, and generational status and the outcome variables of psychological adjustment and intercultural adjustment difficulties. While years in Canada,  $r(148) = .02, p = .80$ , and heritage language proficiency,  $r(148) = -.00, p = .98$ , were not correlated with intercultural adjustment difficulties, they were included in the analyses as control variables due to theoretical reasons. These two variables were deemed to be related to intercultural adjustment difficulties. For example, Shim and Schwartz (2007) found with a sample of 118 Korean adults that length of residence was related to cultural adjustment difficulties. Further, intercultural adjustment difficulties were found to be associated with competency within both the host culture and culture of origin. Hence, heritage language proficiency is believed to be related to intercultural adjustment difficulties in this study. In addition, years in Canada and Heritage language proficiency were negatively correlated with each other,  $r(148) = -.23, p < .01$ , and years in Canada was negatively correlated with sibling conflict,  $r(148) = -.26, p < .01$ . This raised the suspicion that these variables might be suppressor variables in the multiple regression analysis (Cohen, 1988; pg. 84-91). That is, years in Canada and Heritage language proficiency might account for variance in other variables that are correlated with intercultural adjustment difficulties which might change the relation between the predictor variables and intercultural adjustment difficulties.

Two one-way analysis of variance (ANOVA) tests were conducted on the main sample data ( $N = 150$ ) to test for differences on psychological adjustment and intercultural adjustment difficulties among the three sibship gender groups

(female/female, male/male, and mixed) in order to determine if sibship gender should be included in the multiple regression analysis as a control variable. Sibship gender was determined through participants identifying a sibling to rate on acculturation level. There were no significant differences between the female/female ( $M = 99.02$ ,  $SD = 19.30$ ;  $M = 82.25$ ,  $SD = 18.39$ ), Male/Male ( $M = 102.31$ ,  $SD = 18.96$ ;  $M = 85.89$ ,  $SD = 20.35$ ) and Female/Male ( $M = 100.21$ ,  $SD = 18.31$ ;  $M = 79.65$ ,  $SD = 19.99$ ) sibship sex groups on psychological adjustment  $F(2, 146) = .18$ ,  $p = .83$  or intercultural adjustment difficulties,  $F(2, 146) = .74$ ,  $p = .48$ , respectively. Thus, this control variable was not included in the analysis.

Based on the results, the variables years in Canada and Canadian acculturation level were included as control variables for the dependent variable of psychological adjustment. Canadian acculturation level, Heritage acculturation level, and English language proficiency were included in the following analyses as control variables for the dependent variable of intercultural adjustment difficulties. Years in Canada and heritage language proficiency were also included in the regression analyses for intercultural adjustment difficulties based on conceptual reasons.

### **Hierarchical Multiple Regression**

**Assumptions.** The assumptions for the regressions were evaluated. All variables included in the regression were normally distributed as indicated by an examination of histograms as well as skewness and kurtosis values. While kurtosis values for English language proficiency was greater than  $\pm 2$ , this variable was not transformed given that the significance of kurtosis decreases with sample sizes over 100 (Tabachnick & Fidell, 2007).

Outliers were identified by examining Cook's distance (cutoff  $< 1$ ), Mahalanobis Distance (cutoff  $< 15$ ), and Average leverage (cutoff  $< 3[k+1/n] = 12.03$ ). Two cases for each regression analysis were identified as having possible influence on psychological adjustment and intercultural adjustment difficulties. Thus, regressions were conducted separately with and then without these cases. The results revealed no significant differences based on these two approaches. Thus, the regression analysis was conducted with all cases included.

The assumption of no multicollinearity was determined to have been met through the examination of the correlation matrix (no correlation coefficient greater than .8 between predictors), VIF (cutoff <10 and close to 1), and Tolerance (cutoff > 0.1) scores. The homoscedasticity assumption was also met through the examination of scatterplots (standardized residual x standardized predicted value) and partial regression plots of each variable with the criterion. A matrix scatterplot of all combinations of all the relevant variables in the study was examined and it revealed no non-linear associations. Thus, the data met the assumptions for conducting regression analysis.

### **Moderation Effects**

Only moderation effects were examined due to the lack of correlations between sibling Canadian acculturation discrepancy (CA-DIS), sibling heritage acculturation discrepancy (HA-DIS), psychological adjustment (PSYCH) and intercultural adjustment difficulties (INTAD). This is a necessary condition of mediation according to Baron and Kenny (1986). Four separate hierarchical multiple regressions, two for each predictor, were conducted to test for moderation (Aiken & West, 1991; Holmbeck, 1997). Of interest in the current study was the moderating effect of sibling relationship quality (conflict, warmth, and rivalry denoted as CON, WARM, and RIV, respectively) on the relation between the predictor variables and psychological adjustment and intercultural adjustment difficulties, respectively. Prior to creating interaction terms to test for moderating effects, the predictors and moderators were centered to z-scores to reduce multicollinearity (Aiken & West, 1991). To create the interaction terms, the product of each centered predictor and moderator was taken. For example, values for the sibling Heritage acculturation discrepancy for each case was multiplied by the values of the moderator conflict to produce the interaction term of HA-DIS\*CON. In this manner, six interaction terms were created: HA-DIS\*CON, HA-DIS\*WARM, HA-DIS\*RIV, CA-DIS\*CON, CA-DIS\*WARM, and CA-DIS\*RIV.

In the first block, the specific control variables for each criterion variable were entered simultaneously. Next, the main effect predictors and moderators were entered simultaneously in the second block. Last, the interaction terms were entered simultaneously in the final block.

### **Psychological Adjustment and Perceived Canadian Acculturation Discrepancy**

In this regression model, sibling relationship quality (conflict, warmth, and rivalry) was examined as a possible moderator of the relation between perceived Canadian acculturation discrepancy and psychological adjustment. Table 9 represents the results of this regression analysis. The control variables were entered in the first block and together Canadian acculturation and years in Canada accounted for 6.2% of variance in psychological adjustment scores and this was significant,  $R^2 = .06$ ,  $\Delta R^2 = .06$ ,  $F(2, 147) = 4.88$ ,  $p < .01$ . Of the control variables only Canadian acculturation significantly added to variance in predicting psychological adjustment,  $B = .36$ ,  $SE B = .15$ ,  $\beta = .19$ ,  $p < .05$ . When the main predictor and moderator variables were included in the model an additional 8% of variance was accounted for above and beyond years in Canada and Canadian acculturation, which was also significant,  $R^2 = .14$ ,  $\Delta R^2 = .08$ ,  $F(6, 143) = 4.00$ ,  $p < .01$ . There was a main effect for conflict,  $B = -4.85$ ,  $SE B = 1.58$ ,  $\beta = -.26$ ,  $p < .01$ , suggesting that as sibling conflict increases psychological adjustment decreases when years in Canada and Canadian acculturation were held constant. The interaction terms were not significant when added to the model indicating no moderation effect.

### **Psychological Adjustment and Perceived Heritage Acculturation Discrepancy**

In this regression model, sibling relationship quality (conflict, warmth, and rivalry) was examined as a possible moderator of the relation between perceived heritage acculturation discrepancy and psychological adjustment. The first block includes the same control variables, years in Canada and Canadian acculturation, as in the previous regression model with psychological adjustment as the criterion variable. The second block, which included perceived heritage acculturation discrepancy as the main predictor and sibling relationship quality as the moderators, was significant,  $R^2 = .14$ ,  $\Delta R^2 = .08$ ,  $F(2, 147) = 3.98$ ,  $p = .001$ ) which accounted for an additional 8.1% of variance in psychological adjustment. As above, sibling conflict significantly contributed to the prediction of psychological adjustment,  $B = -4.82$ ,  $SE B = 1.58$ ,  $\beta = -.26$ ,  $p < .01$ . The interaction terms were not significant when added to the third block indicating no moderation effect. Table 10 represents the results of this regression analysis.



Table 9

*Hierarchical Regression Analysis Summary for Perceived Canadian Acculturation Discrepancy predicting Psychological Adjustment with Moderation by Sibling Relationship Quality (N = 150)*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(2,147)$
Criterion: PSYCH						
Step 1				.06	.06	4.88**
(Constant)	57.01	13.83				
Years in Canada	.83	.43	.16			
CA-self	.36*	.15	.19			
Step 2				.14	.08	4.00**
(Constant)	62.75	14.17				
Years in Canada	.43	.44	.08			
CA-self	.40*	.15	.21			
CA-DIS	-.47	1.50	-.03			
CON	-4.85**	1.58	-.26			
WARM	-.16	1.51	-.01			
RIV	-1.45	1.53	-.08			
Step 3				.16	.02	2.93**
(Constant)	63.42	14.60				
Years in Canada	.49	.45	.09			
CA-self	.38*	.16	.20			
CA-DIS	-.14	1.58	-.01			
CON	-4.87**	1.60	-.26			
WARM	-.18	1.51	-.01			
RIV	-1.20	1.58	-.06			
CA-DIS x CON	-.67	1.80	-.04			
CA-DIS x WARM	1.79	1.34	.11			
CA-DIS x RIV	-.22	1.70	-.01			

*Note.* \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; PSYCH = psychological adjustment; CA-self = Canadian acculturation; CA-DIS = perceived Canadian acculturation discrepancy; CON = sibling conflict; WARM = sibling warmth; RIV = sibling rivalry.

Table 10

*Hierarchical Regression Analysis Summary for Perceived Heritage Acculturation Discrepancy predicting Psychological Adjustment with Moderation by Sibling Relationship Quality (N = 150)*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(2,147)$
Criterion: PSYCH						
Step 1				.06	.06	4.88**
(Constant)	57.01	13.84				
Years in Canada	.83	.43	.16			
CA-self	.36*	.15	.19			
Step 2				.14	.08	3.98**
(Constant)	61.94	14.17				
Years in Canada	.45	.44	.08			
CA-self	.40*	.15	.21			
HA-DIS	.02	1.51	.00			
CON	-4.82**	1.58	-.26			
WARM	-.01	1.51	-.01			
RIV	-1.47	1.56	-.08			
Step 3				.16	.01	2.92**
(Constant)	64.40	14.29				
Years in Canada	.36	.44	.07			
CA-self	.39*	.15	.20			
HA-DIS	-.58	1.59	-.03			
CON	-4.69**	1.62	-.25			
WARM	-.33	1.57	-.02			
RIV	-.19	1.60	-.10			
HA-DIS x CON	.64	1.44	.04			
HA-DIS x WARM	1.04	1.51	.06			
HA-DIS x RIV	2.01	1.82	.10			

*Note.* \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; PSYCH = psychological adjustment; CA-self = Canadian acculturation; HA-DIS = perceived heritage acculturation discrepancy; CON = sibling conflict; WARM = sibling warmth; RIV = sibling rivalry.

### **Intercultural Adjustment Difficulties and Perceived Canadian Acculturation Discrepancy**

In this regression model, sibling relationship quality (conflict, warmth, and rivalry) was examined as a possible moderator of the relation between perceived Canadian acculturation discrepancy and intercultural adjustment difficulties. In the first block, the control variables (years in Canada, English language proficiency, Heritage Language proficiency, Canadian acculturation and Heritage acculturation) together accounted for 20.9% of variance of intercultural adjustment difficulties which was significant,  $R^2 = .21$ ,  $\Delta R^2 = .21$ ,  $F(5,144) = 7.62$ ,  $p < .001$ . Of the control variables, English language proficiency,  $B = -.94$ ,  $SE B = .28$ ,  $\beta = -.28$ ,  $p < .01$ , Canadian acculturation,  $B = -.52$ ,  $SE B = .16$ ,  $\beta = -.26$ ,  $p < .01$ , and Heritage acculturation,  $B = -.36$ ,  $SE B = .12$ ,  $\beta = -.25$ ,  $p < .01$ , were significant predictors. When the main predictor and moderators were added to the model in the second block, the model was significant  $R^2 = .28$ ,  $\Delta R^2 = .07$ ,  $F(9, 140) = 6.16$ ,  $p < .001$  and accounted for 7.4% of variance in the prediction of intercultural adjustment difficulties above and beyond control variables. A significant main effect of sibling conflict was found,  $B = 5.47$ ,  $SE B = 1.53$ ,  $\beta = .28$ ,  $p < .001$ . This suggests that participants who reported increased sibling conflict were more likely to report increased intercultural adjustment difficulties when English language proficiency, Canadian acculturation and Heritage acculturation are held constant. The interaction terms were not significant when added to the model indicating no moderation effect on sibling relationship quality. Table 11 represents the results of this regression analysis.

### **Intercultural Adjustment Difficulties and Perceived Heritage Acculturation Discrepancy**

In this regression model, sibling relationship quality (conflict, warmth, and rivalry) was examined as a possible moderator of the relation between perceived heritage acculturation discrepancy and intercultural adjustment difficulties. Table 12 represents the results of this regression analysis. The first step in the regression included the same control variables as in the previous regression and thus, the findings were the same. The second block in the regression was found to be significant,  $R^2 = .28$ ,  $\Delta R^2 = .07$ ,  $F(9,140) = 6.12$ ,  $p < .001$  and accounted for an additional 7.3% of variance in intercultural

Table 11

*Hierarchical Regression Analysis Summary for Perceived Canadian Acculturation Discrepancy predicting Intercultural Adjustment Difficulties with Moderation by Sibling Relationship Quality (N = 150)*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(5,144)$
Criterion: INTAD						
Step 1				.21	.21	7.62***
(Constant)	201.26	24.41				
Years in Canada	.08	.43	.02			
CA-self	-.52**	.16	-.26			
HA-self	-.36**	.12	-.25			
EngLanPro	-.94**	.28	-.28			
HerLanPro	-.20	.17	-.10			
Step 2				.28	.07	6.16***
(Constant)	201.37	24.09				
Years in Canada	.33	.44	.06			
CA-self	-.59***	.16	-.30			
HA-self	-.40**	.11	-.27			
EngLanPro	-.89**	.27	-.27			
HerLanPro	-.25	.17	-.13			
CA-DIS	-1.64	1.48	-.08			
CON	5.47***	1.53	.28			
WARM	.18	1.46	.01			
RIV	-2.12	1.50	-.11			
Step 3				.29	.01	4.66***
(Constant)	198.63	24.39				
Years in Canada	.33	.45	.06			
CA-self	-.57***	.16	-.29			
HA-self	-.39**	.12	-.27			
EngLanPro	-.88**	.28	-.26			
HerLanPro	-.54	.17	-.13			
CA-DIS	-.186	1.57	-.10			
CON	5.49**	1.55	.28			
WARM	.20	1.47	.01			
RIV	-2.07	1.56	-.11			
CA-DIS x CON	-1.22	1.79	-.06			

CA-DIS x WARM	-.87	1.32	-.05
CA-DIS x RIV	.18	1.67	.01

---

*Note.* \*\*\*  $p < .001$  \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; INTAD = intercultural adjustment difficulties; CA-self = Canadian acculturation; HA-self = heritage acculturation; EngLanPro = English language proficiency; HerLanPro = heritage language proficiency; CA-DIS = perceived Canadian acculturation discrepancy; CON = sibling conflict; WARM = sibling warmth; RIV = sibling rivalry.

Table 12

*Hierarchical Regression Analysis Summary for Perceived Heritage Acculturation Discrepancy predicting Intercultural Adjustment Difficulties with Moderation by Sibling Relationship Quality (N = 150)*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(5,144)$
Criterion: INTAD						
Step 1				.21	.21	7.62***
(Constant)	201.27	24.41				
Years in Canada	.08	.43	.02			
CA-self	-.52**	.16	-.26			
HA-self	-.36**	.12	-.25			
EngLanPro	-.94**	.28	-.28			
HerLanPro	-.20	.17	-.10			
Step 2				.28	.07	6.12***
(Constant)	196.33	23.89				
Years in Canada	.40	.43	.07			
CA-self	-.60***	.16	-.30			
HA-self	-.38**	.11	-.26			
EngLanPro	-.85**	.28	-.26			
HerLanPro	-.21	.17	-.11			
HA-DIS	1.46	1.49	.08			
CON	5.47***	1.53	.28			
WARM	.62	1.47	.03			
RIV	-2.42	1.53	-.13			
Step 3				.33	.04	5.50***
(Constant)	200.05	23.57				
Years in Canada	.54	.43	.10			
CA-self	-.57***	.15	-.29			
HA-self	-.37**	.11	-.25			
EngLanPro	-.99**	.28	-.30			
HerLanPro	-.23	.17	-.12			
HA-DIS	2.35	1.52	.12			
CON	5.90***	1.54	.30			
WARM	.46	1.49	.02			
RIV	-2.38	1.55	-.12			
HA-DIS x CON	-2.89*	1.38	-.17			

HA-DIS x WARM	.44	1.43	.02
HA-DIS x RIV	-2.00	1.75	-.10

---

*Note.* \*\*\*  $p < .001$  \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; INTAD = intercultural adjustment difficulties; CA-self = Canadian acculturation; HA-self = heritage acculturation; EngLanPro = English language proficiency; HerLanPro = heritage language proficiency; HA-DIS = perceived heritage acculturation discrepancy; CON = sibling conflict; WARM = sibling warmth; RIV = sibling rivalry.

adjustment difficulties. A simple effect was noted for sibling conflict,  $B = 5.47$ ,  $SE B = 1.53$ ,  $\beta = .28$ ,  $p = .001$ . The final step with interaction terms included was also significant  $R^2 = .33$ ,  $\Delta R^2 = .04$ ,  $F(12, 137) = 5.49$ ,  $p < .001$ . There was a significant interaction effect for the term HA-DIS x CON,  $B = -2.89$ ,  $SE B = 1.37$ ,  $\beta = -.17$ ,  $p < .05$ . This finding suggests that sibling conflict moderates the relation between heritage acculturation discrepancy and intercultural adjustment difficulties.

**Probing significant interactions.** In order to interpret the significant interaction effect between heritage sibling acculturation discrepancy (HA-DIS) and sibling conflict (CON) the interaction effect was plotted (see Appendix G). The method for probing significant interactions in multiple regression outlined by Aiken and West (1991) was followed. First, a hierarchical regression analysis was conducted that included only the significant control variables (Canadian acculturation, heritage acculturation, and English language proficiency), independent variable (Perceived heritage acculturation discrepancy), moderator (Conflict), the significant interaction term (HA-DIS x CON), and intercultural adjustment difficulties as the criterion. This was done to simplify the regression equation and obtain simple slopes to plot the interaction effect. Table 13 summarizes the results of the simplified regression analysis. Second, the regression equation was rearranged as a regression of intercultural adjustment difficulties (criterion) on heritage sibling acculturation discrepancy (predictor) at various levels of sibling conflict (moderator). The means of the control variables were substituted into the equation as suggested by Holmbeck (1997). The interaction between the control variables and independent variable were examined through multiple regression and were found to be non-significant. This was a pre-requisite for substituting their mean values into the regression equation above to plot the interaction (Holmbeck, 1997). In order to plot the regression lines, values for intercultural adjustment difficulties were calculated. First, simple regression equations were generated using sibling conflict values one standard deviation above the mean for high sibling conflict, and one standard deviation below the mean for low sibling conflict. Heritage acculturation discrepancy and sibling conflict variables were centered to z-scores prior to conducting the multiple regression analyses resulting in a mean of 0 and a standard deviation of 1 for both variables.



Table 13

*Simplified Hierarchical Regression Analysis Summary for Perceived Heritage Acculturation Discrepancy predicting Intercultural Adjustment Difficulties with Moderation by Sibling Conflict and Significant Control Variables (N = 150)*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(5,144)$
Criterion: INTAD						
Step 1				.20	.20	12.20***
(Constant)	189.55	19.11				
CA-self	-.49**	.15	-.24			
HA- self	-.40**	.11	-.27			
EngLanPro	-.82**	.26	-.24			
Step 2				.25	.05	9.65***
(Constant)	189.24	18.66				
CA-self	-.53**	.15	-.27			
HA- self	-.29**	.11	-.27			
EngLanPro	-.75**	.26	-.23			
HA-DIS	1.28	1.43	.07			
CON	4.08**	1.40	.21			
Step 3				.28	.03	9.32***
(Constant)	194.74	18.48				
CA-self	-.53***	.15	-.27			
HA- self	-.40***	.11	-.28			
EngLanPro	-.84**	.26	-.25			
HA-DIS	1.78	1.42	.09			
CON	4.36**	1.39	.23			
HA-DIS x CON	-3.12*	1.27	-.18			

*Note.* \*\*\*  $p < .001$  \*\*  $p < .01$ , \*  $p < .05$ ;  $B$  = unstandardized multiple regression coefficient;  $SEB$  = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's F ratio, test of significance of change; INTAD = intercultural adjustment difficulties; CA-self = Canadian acculturation; HA-self = heritage acculturation; EngLanPro = English language proficiency; HA-DIS = perceived heritage acculturation discrepancy; CON = sibling conflict.

To plot the simple regression lines, values of perceived heritage acculturation discrepancy two standard deviations above the mean, two standard deviations below the mean and at the mean were selected. These values represent low, medium and high values of perceived heritage acculturation discrepancy and produced six data points which were then plotted. From Figure 1, it is clear that perceived heritage acculturation discrepancy is associated with intercultural adjustment difficulties differently for varying levels of sibling conflict. Specifically, for participants who reported high sibling conflict, high perceived heritage acculturation discrepancy was related to low intercultural adjustment difficulties. For those who reported low conflict in their sibling relationship, high perceived heritage acculturation discrepancy was related to high intercultural adjustment difficulties.

**Post hoc significance testing of simple slopes.** Further post hoc probing of the significant interaction was conducted to examine whether the slope of the simple regression lines were significantly differed from zero. To this end, two hierarchical multiple regression were conducted adhering to the recommendations of Aiken and West (1991). First, two conditional variables were created by subtracting a conditional value of sibling conflict (CVz) one standard deviation above the mean (CVzabove = 1) to create the new variable ZAbove ( $Z - CVzabove$ ) and one standard deviation below the mean (CVzbelow = -1) to create the new variable Zbelow ( $Z - Cvzbelow$ ). Then, two interaction terms were created by multiplying the new conditional variables of sibling conflict with the predictor variable, perceived heritage acculturation discrepancy, yielding the terms  $X*CVzabove$  and  $X*CVzbelow$ . Two multiple regressions were conducted with the control variables in block 1, the predictor, the conditional sibling conflict variable and the corresponding interaction term in the second block to test the significance of the slopes (see Table 14 and 15). The results of significance testing indicated that the slope for high conflict was not significant,  $t(143) = -.70, p = .45$  suggesting that perceived heritage acculturation discrepancy is not associated with intercultural adjustment difficulties for participants who reported high sibling conflict in their relationship. The slope for low conflict was statistically significant,  $t(143) = 2.40, p < .05$ . This suggests that for participants who reported low sibling conflict, as perceived heritage acculturation discrepancies increase so do intercultural adjustment difficulties.

Figure 1 Interaction between Perceived Heritage Acculturation Discrepancy and Sibling Conflict Predicting Intercultural Adjustment Difficulties

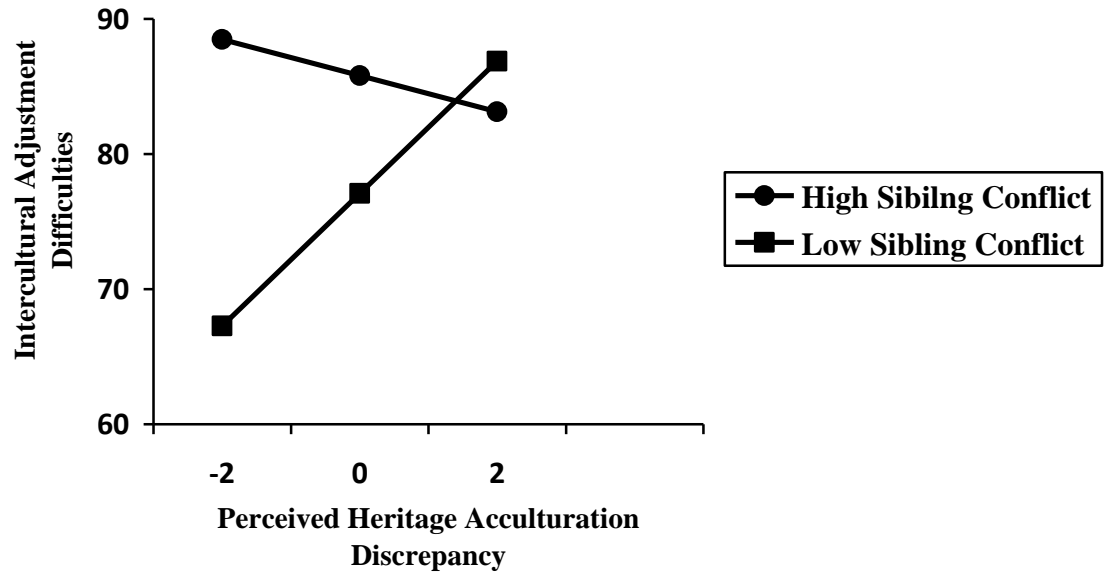


Table 14

*Multiple Regression Summary Testing Significance of Slope for High Conflict Group*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(5,144)$
Criterion: INTAD						
Step 1				.20	.20	12.20***
(Constant)	189.55	19.12				
CA-self	-.49**	.15	-.24			
HA-self	-.40**	.11	-.27			
EngLanPro	-.82**	.26	-.24			
Step 2				.28	.08	9.32***
(Constant)	199.10	18.56				
CA-self	-.53***	.15	-.27			
HA-self	-.40***	.11	-.28			
EngLanPro	-.84**	.26	-.25			
HA-DIS	-1.34	1.39	-.07			
Zabove	4.36**	1.27	.23			
XZabove	-3.12*	1.77	-.22			

*Note.* \*\*\*  $p < .001$  \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; INTAD = intercultural adjustment difficulties; CA-self = Canadian acculturation; HA-self = heritage acculturation; HA-DIS = perceived heritage acculturation discrepancy; EngLanPro = English language proficiency; Zabove = conditional variables of Z one standard deviation above the mean; XZabove = interaction between HA-DIS and Zabove.

Table 15

*Multiple Regression Summary Testing Significance of Slope for Low Conflict Group*

Variables	B	SEB	$\beta$	$R^2$	$\Delta R^2$	$F(5,144)$
Criterion: INTAD						
Step 1				.20	.20	12.20***
(Constant)	189.55	19.12				
CA-self	-.49**	.15	-.24			
HA-self	-.40**	.11	-.27			
EngLanPro	-.82**	.26	-.24			
Step 2				.28	.08	9.32***
(Constant)	190.38	18.50				
CA-self	-.53***	.15	-.27			
HA-self	-.40***	.11	-.28			
EngLanPro	-.84**	.26	-.25			
HA-DIS	4.89*	1.39	-.07			
Zbelow	4.36**	1.27	.23			
XZbelow	-3.12*	1.77	-.22			

*Note.* \*\*\*  $p < .001$  \*\*  $p < .01$ , \*  $p < .05$ ; B = unstandardized multiple regression coefficient; SEB = standard error of unstandardized multiple regression coefficient;  $\beta$  = standardized multiple regression coefficient;  $R^2$  = multiple correlation squared, measure of strength of relationship;  $\Delta R^2$  = multiple correlation squared change, measure of change in strength of relationship;  $F$  = Fisher's  $F$  ratio, test of significance of change; INTAD = intercultural adjustment difficulties; CA-self = Canadian acculturation; HA-self = heritage acculturation; EngLanPro = English language proficiency; HA-DIS = perceived heritage acculturation discrepancy; Zbelow = conditional variables of Z one standard deviation below the mean; XZbelow = interaction between HA-DIS and Zbelow.

### **Research Question 3: Differences between Vietnamese and Chinese Young Adults**

Group differences between Vietnamese and Chinese participants on the study's key variables of acculturation level, perceived sibling acculturation discrepancy, sibling relationship quality, psychological adjustment and intercultural adjustment difficulties were investigated in the present study. It was hypothesized that Vietnamese and Chinese participants would differ on the study's key variables. A one-way between-subjects multivariate analysis of variance (MANOVA) analysis was performed in order to test the hypotheses.

Of the 150 participants in the main sample, 41 self-identified as ethnically Vietnamese while 80 identified as ethnically Chinese on the demographic questionnaire. Of the remaining 29 cases, 10 self-identified as Vietnamese-Chinese and 3 self-identified as other while 16 participants did not indicate their ethnicity on the demographic questionnaire. The VIA-self measure requests that respondents indicate their heritage culture prior to completing the questionnaire. In this way, an additional 11 Vietnamese cases and an additional 5 Chinese cases were identified. In total, 135 cases were included in the MANOVA analysis with 52 Vietnamese cases and 85 Chinese cases. Normality of the dependent variables was examined in each group revealing skewness values falling within +/- 2, indicating that all the dependent variables were normality distributed in both groups. The correlations between the dependent variables and the potential covariates were examined to determine which covariates would be appropriate for inclusion in the analysis. According to Tabachnick and Fidell (2007), to be considered covariates, variables should all be correlated with the dependent variables and yet uncorrelated with each other. No covariates met these criteria and thus, no covariates were included in the analysis.

Prior to the MANOVA analysis, Box's M test and Levene's test were conducted to examine the assumption of homogeneity of variance-covariance. Box's M test was significant ( $p < .01$ ) suggesting that the covariance is not equal across the groups. However, Tabachnick and Fidell (2007) suggest robustness of the MANOVA is not guaranteed if group sample sizes are unequal and Box's M is significant at  $p < .001$ . Given the unequal sample sizes, the variances and covariances of each group were examined to determine if the significant Box's M test could be trusted (Tabachnick & Fidell, 2007).

Examination of the variances and covariances of each group revealed that larger variances and covariances were noted for the smaller Vietnamese group suggesting that Box's M test may not be accurate. This finding also suggests that significant differences between groups may not be valid while non-significant findings will be valid. However, Box's M is highly sensitive to very slight deviations in larger samples and thus, should be treated with caution (Field, 2005). In addition, Levene's test of equality of error variances tests yielded significance for heritage acculturation,  $F(1, 135) = 4.87, p < .05$ ; perceived Canadian acculturation discrepancy,  $F(1, 135) = 5.59, p < .05$ ; and psychological adjustment,  $F(1, 135) = 5.50, p < .05$ , indicating that these variables violated the assumption of homogeneity of variance. Therefore, Pillai's Trace was used as the indicator for the significance test of the MANOVA as it is robust to problems associated with unequal cell sizes or when the assumption of homogeneity of variance and covariance is violated (Tabachnick & Fidell, 2007). As well, independent samples Mann-Whitney U and Kruskal-Wallis tests, non-parametric tests, were conducted to test for group differences on the variables of heritage acculturation, perceived Canadian acculturation discrepancy and psychological adjustment. Non-parametric tests do not require that assumptions of normality or homogeneity of variance be met (Field, 2005).

### **MANOVA**

The 9 x 2 (9 dependent variables x 2 levels of the independent variable) one-way independent MANOVA was conducted to explore differences between Vietnamese and Chinese participants on the dependent variables. Table 16 summarizes results of the MANOVA. The omnibus multivariate analysis showed a significant difference between the two groups on the dependent variables as indicated by a significant Pillai's Trace,  $F(9, 127) = 2.28, p < .05$ . Partial Eta squared ( $\eta^2_p$ ) was examined to determine the percentage of variance in the dependent variables accounted for by ethnicity, which was 13.9% in this sample.

### **Follow-up ANOVAs**

Follow up univariate ANOVAs indicated that Chinese participants reported higher heritage acculturation ( $M = 66.42, SD = 11.41$ ) than Vietnamese participants ( $M = 59.17, SD = 14.70$ ),  $F(1, 135) = 10.42, p < .01$ . Vietnamese and Chinese participants also differed with respect to psychological adjustment,  $F(1, 135) = 4.23, p < .05$ . Chinese

Table 16

*Summary of MANOVA Results for the Effect of Ethnicity on Study Variables*

Variables	$F(1,135)$	$\eta_p^2$	Obs. Power
Heritage Acculturation	10.42**	.07	.89
Psychological Adjustment	4.23*	.03	.53
Perceived Canadian Acculturation Discrepancy	3.73	.03	.48
Warmth	3.69	.03	.48
Intercultural adjustment difficulties	1.76	.01	.26
Rivalry	.21	.00	.07
Canadian Acculturation	.04	.00	.06
Perceived Heritage Acculturation Discrepancy	.10	.00	.06
Conflict	.01	.00	.05

*Note.* \*\*  $p < .001$ . Multivariate F ratios were generated from Wilks Lambda statistic. Obs. power = Observed Power.



participants ( $M = 102.05$ ,  $SD = 16.24$ ) reported better psychological adjustment than Vietnamese participants ( $M = 95.45$ ,  $SD = 21.12$ ). Vietnamese and Chinese participants did not differ significantly from one another on any other dependent variables. The results of univariate ANOVAs are summarized in Table 17. Because Heritage acculturation, perceived Canadian acculturation discrepancy and psychological adjustment violated the assumption of homogeneity of variance as indicated by a significant Levene's test statistic, the non-parametric Mann-Whitney U and Kruskal-Wallis tests were performed to determine if the two groups differed on these variables. The Mann-Whitney U test,  $U = 1449$ ,  $p < .01$ ,  $r = -.28$ , as well as the Kruskal-Wallis test,  $\chi^2(1, 134) = 10.29$ ,  $p < .01$  were both statistically significant for heritage acculturation, indicating that Chinese participants ( $Mdn = 68$ ) reported higher Heritage acculturation than Vietnamese participants ( $Mdn = 60.5$ ). The two groups did not differ with respect to perceived Canadian acculturation discrepancy and psychological adjustment as indicated by non-significant Mann-Whitney U and Kruskal-Wallis tests.

To further explore this finding, an independent samples t-test was conducted on the dependent variables of years in Canada and age. Levene's test indicated that the homogeneity of variance assumption was met for years in Canada,  $F(1, 135) = 3.40$ ,  $p = .07$ , and age,  $F(1, 135) = .94$ ,  $p = .33$ . The t-tests revealed that Chinese and Vietnamese participants differed on years residing in Canada,  $t(135) = -2.02$ ,  $p < .05$ , and age,  $t(135) = -2.54$ ,  $p < .05$ . Thus, Chinese participants have resided in Canada longer ( $M = 21.18$ ,  $SD = 3.81$ ), and were older ( $M = 22.01$ ,  $SD = 3.12$ ) than Vietnamese participants ( $M = 19.94$ ,  $SD = 2.82$  and  $M = 20.67$ ,  $SD = 2.73$ ).

#### **Follow-up Discriminant Function Analysis.**

As a follow-up to the significant MANOVA finding, discriminant function analysis or discriminant analysis (DA) is recommended in order to examine the relation between dependent variables (Field, 2005). A discriminant analysis was performed using nine study variables as predictors of membership in two groups, Vietnamese and Chinese. The nine predictor variables were Canadian acculturation, heritage acculturation, perceived Canadian acculturation discrepancy, perceived heritage acculturation discrepancy, sibling conflict, sibling warmth, sibling rivalry, psychological adjustment and intercultural adjustment difficulties.

Table 17

*Summary of ANOVA results for Effect of Ethnicity on Study Variables*

Variable	<i>df</i>	Sum of Squares	Mean Squares	<i>F</i>	<i>p</i>
Heritage Acculturation					
Between Groups	1	1696.02	1696.02	10.42	.00
Within Groups	135	21972.19	162.76		
Total	136	23668.22			
Psychological Adjustment					
Between Groups	1	1407.13	1407.13	4.23	.04
Within Groups	135	44886.66	332.49		
Total	136	46293.79			
Perceived Canadian Acculturation Discrepancy					
Between Groups	1	125.63	125.63	3.73	.06
Within Groups	135	4550.91	33.71		
Total	136	4676.54			
Sibling Warmth					
Between Groups	1	2.46	2.46	3.69	.06
Within Groups	135	90.01	.67		
Total	136	92.47			
Intercultural Adjustment Difficulties					
Between Groups	1	643.95	643.95	1.76	.19
Within Groups	135	49543.31	366.99		
Total	136	50187.26			
Sibling Rivalry					
Between Groups	1	.05	.05	.21	.65
Within Groups	135	35.13	.26		
Total	136	35.18			
Canadian Acculturation					
Between Groups	1	3.99	3.99	.04	.84
Within Groups	135	12664.47	93.81		
Total	136	12668.47			
Perceived Heritage Acculturation Discrepancy					
Between Groups	1	12.43	12.43	.10	.75
Within Groups	135	16465.35	121.97		
Total	136	16477.78			
Sibling Conflict					
Between Groups	1	.00	.00	.01	.95
Within Groups	135	71.82	.53		
Total	136	71.82			

*Note.* ANOVA = Analysis of Variance

Since there were only two groups there was only one discriminant function. The analysis indicated that the eigenvalue of the discriminant function was significant,  $\chi^2(9, 128) = 19.55, p < .05$ . The eigenvalue for the discriminant function is .16 (Tabachnick & Fidell, 2007). This suggests that the discriminant function discriminates Vietnamese participants from Chinese participants and accounts for 16.2% of variance in ethnicity. The standardized discriminant function coefficients and structure coefficients were examined to determine the unique contribution of each variable to the discriminant function with higher values (i.e., values close to +/- 1) indicating a greater contribution of that variable to discriminating between Vietnamese and Chinese participants (Field, 2005). From these values, it is apparent that heritage acculturation level contributes the most to discriminating between Vietnamese and Chinese participants, while psychological adjustment, perceived Canadian acculturation discrepancy, and sibling warmth contribute moderately to the prediction of group membership. The remaining variables of sibling rivalry, perceived heritage acculturation discrepancy, Canadian acculturation, and sibling conflict do not contribute to discrimination between Vietnamese and Chinese participants. That is, the variables heritage acculturation, psychological adjustment, perceived Canadian acculturation discrepancy and sibling warmth best discriminate between Vietnamese and Chinese participants in this sample. Table 18 presents the standardized canonical discriminant function coefficients and structure coefficients of the discriminant function analysis.

### **The Sibling Pairs Sample**

#### **Exploring the Data**

For 13 of the 36 cases, 8 items from the CADC measure were missing from the data set due to an oversight during transfer of items to online survey format. Data for these 8 items were available for the remaining cases and the stochastic regression imputation method described previously was utilized.

Actual and perceived sibling acculturation discrepancy scores were created using the same subtraction method as for the Main data set. For actual host and heritage acculturation discrepancy scores, the absolute value of the difference between each siblings' acculturation scores on the VIA were utilized. The psychological adjustment score is a composite of scores on the CES-D and the BSI-18. The method used to

Table 18

*Standardized Discriminant Function and Structure Coefficients of the Discriminant Function Analysis*

Predictor Variable	Standardized Canonical Discriminant Function Coefficients	Structure Coefficients
Heritage Acculturation	.62	.69
Psychological Adjustment	.48	.44
Warmth	.37	.41
Perceived Canadian Acculturation Discrepancy	-.31	-.41
Intercultural adjustment difficulties	-.11	-.28
Rivalry	.25	.10
Canadian Acculturation	-.36	-.04
Perceived Heritage Acculturation Discrepancy	-.01	-.07
Conflict	.14	.02

combine these scores is the same as that employed for the psychological adjustment composite score used in the Main data set.

#### **Research Question 4: Do Siblings Misperceive Acculturation Discrepancies Between Them?**

In order to explore whether siblings misperceive acculturation discrepancies between them, paired samples t-tests were conducted. The actual acculturation discrepancy scores for each sibling pair was the same. As such, the sample was divided into two groups based on birth order (older and younger) and separate analyses were conducted for each subsample. Birth order was chosen as the criterion used to divide the two groups because this most closely resembles the division between parents and children in acculturation discrepancy research. Two paired samples t-tests were conducted for each subsample comparing actual and perceived Canadian and heritage acculturation discrepancy. It was hypothesized that siblings would misperceive the difference in acculturation between each other. Prior to conducting the analysis, data were evaluated to be normally distributed based on examination of histograms as well as skewness and kurtosis values. All variables included in the following analyses were normally distributed.

**Older siblings.** Two paired samples t-tests were conducted to compare actual and perceived Canadian and heritage acculturation discrepancy in older siblings. Table 19 displays the means and standard deviations of the study variables for older siblings. For Canadian acculturation discrepancy, the mean actual acculturation discrepancy score ( $M = 7.61$ ,  $SE = 1.29$ ) was higher than the mean perceived Canadian acculturation discrepancy score ( $M = 5.05$ ,  $SE = 0.93$ ), however, the difference was not significant,  $t(17) = 2.09$ ,  $p > .05$ ,  $r = .20$ ). This suggests that older siblings accurately perceive the difference between themselves and their sibling on Canadian acculturation.

For heritage acculturation discrepancy, the mean actual acculturation discrepancy score ( $M = 12.33$ ,  $SE = 2.81$ ) was higher than the mean perceived acculturation discrepancy score ( $M = 11.67$ ,  $SE = 2.40$ ), however, the difference was not significant,  $t(17) = 0.28$ ,  $p = .79$ ,  $r = .06$ . This suggests that older siblings accurately perceive heritage acculturation discrepancies between themselves and their siblings.

Table 19

*Descriptive Statistics of Study Variables for the Sibling Pairs Data Set – Older Siblings*

Variables	Mean	SD
CA-DIS	5.05	3.98
HA-DIS	11.67	10.17
ACA-DIS	7.61	5.48
AHA-DIS	12.33	11.93
PSYCH	99.88	17.46
INTAD	117.77	14.30

*Note.*  $N = 18$ ; CA-DIS = perceived Canadian acculturation discrepancy; HA-DIS = perceived heritage acculturation discrepancy; ACA-DIS = actual Canadian acculturation discrepancy; AHA-DIS = actual heritage acculturation discrepancy; PSYCH = psychological adjustment; INTAD = intercultural adjustment difficulties.

**Younger siblings.** Two paired samples t-tests were conducted to compare actual and perceived Canadian and heritage acculturation discrepancy in younger siblings. Table 20 displays the means and standard deviations of the study variables. For Canadian acculturation discrepancy, the mean actual acculturation discrepancy score ( $M = 7.61$ ,  $SE = 1.29$ ) was higher than the mean perceived Canadian acculturation discrepancy score ( $M = 5.33$ ,  $SE = 1.18$ ), however, the difference was not significant,  $t(17) = 1.15$ ,  $p = .27$ ,  $r = .07$ ). This finding suggests that younger siblings accurately perceive Canadian acculturation differences between themselves and their sibling.

The mean actual heritage acculturation discrepancy score ( $M = 12.33$ ,  $SE = 2.81$ ) was higher than the mean perceived heritage acculturation discrepancy score ( $M = 9.61$ ,  $SE = 2.12$ ), however, the difference was not significant,  $t(17) = 1.15$ ,  $p = .27$ ,  $r = .07$ . This suggests that younger siblings accurately perceive heritage acculturation discrepancies between themselves and their siblings.

#### **Research Question 5: Is Actual or Perceived Acculturation Discrepancy related to Adjustment Outcomes**

In order to examine whether perceived or actual sibling acculturation differences is a better predictor of psychological adjustment and intercultural adjustment difficulties Pearson product-moment correlations were conducted and the coefficients were tested for significant difference. It was hypothesized that perceived acculturation discrepancy would be more significantly associated with psychological adjustment and intercultural adjustment difficulties than actual acculturation discrepancy. The sample was again divided into two subsamples, older and younger siblings and analyses were conducted separately for these two subsamples.

#### **Correlational Analyses**

Table 21 and 22 displays the inter-correlations of study variables for older and younger siblings.

**Older siblings.** For older siblings, only actual heritage acculturation discrepancy was significantly negatively correlated with psychological adjustment,  $r(16) = -.59$ ,  $p < .05$ . Perceived heritage acculturation discrepancy, perceived Canadian acculturation discrepancy and actual Canadian acculturation discrepancy were not significantly correlated with psychological adjustment. Intercultural adjustment difficulties were not

Table 20

*Descriptive Statistics of Study Variables for the Sibling Pairs Data Set – Younger Siblings*

Variables	Mean	SD
CA-DIS	5.33	5.04
HA-DIS	9.61	9.00
ACA-DIS	7.61	5.48
AHA-DIS	12.33	11.93
PSYCH	100.12	19.21
INTAD	112.50	21.61

*Note.*  $N = 18$ ; CA-DIS = perceived Canadian acculturation discrepancy; HA-DIS – perceived heritage acculturation discrepancy; ACA-DIS = actual Canadian acculturation discrepancy; AHA-DIS = actual heritage acculturation discrepancy; PSYCH = psychological adjustment; INTAD = intercultural adjustment difficulties.



Table 21

*Inter-correlations of Study Variables for Sibling Pairs Data Set – Older Siblings*

Variables	HA-DIS	CA-DIS	AHA-D	ACA-D	PSYCH	INTAD
HA-DIS	--	-.02	.58*	-.30	-.21	.13
CA-DIS		--	-.22	.44	.20	.29
AHA-D			--	-.33	-.59*	.24
ACA-D				--	-.01	-.06
PSYCH					--	-.70**
INTAD						--

*Note.* \*\*  $p < .01$ , \*  $p < .05$ ;  $N = 18$ ; HA-DIS = perceived heritage acculturation discrepancy; CA-DIS = perceived Canadian acculturation discrepancy; AHA-D = actual heritage acculturation discrepancy; ACA-D = actual Canadian acculturation discrepancy; PSYCH = psychological adjustment; INTAD = intercultural adjustment difficulties.

Table 22

*Inter-correlations of Study Variables for Sibling Pairs Data Set – Younger Siblings*

Variables	HA-DIS	CA-DIS	AHA-D	ACA-D	PSYCH	INTAD
HA-DIS	--	-.17	.57*	-.12	-.40	.50*
CA-DIS		--	.11	-.27	.24	-.06
AHA-D			--	-.33	-.12	.57*
ACA-D				--	-.20	-.29
PSYCH					--	-.45
INTAD						--

*Note.* \*\*  $p < .01$ , \*  $p < .05$ ;  $N = 18$ ; HA-DIS = perceived heritage acculturation discrepancy; CA-DIS = perceived Canadian acculturation discrepancy; AHA-D = actual heritage acculturation discrepancy; ACA-D = actual Canadian acculturation discrepancy; PSYCH = psychological adjustment; INTAD = intercultural adjustment difficulties.

significantly correlated with any of the four acculturation discrepancy scores.

**Younger siblings.** For younger siblings, only actual heritage acculturation discrepancy was significantly positively correlated with intercultural adjustment difficulties,  $r(16) = .57, p < .05$ .

### **Testing the Difference Between Dependent Correlations**

The method outlined by Howell (2007) of William's test of significance for difference in regression variables was utilized to test the difference between two dependent correlations in the present study.

**Older siblings.** Given that only actual heritage acculturation discrepancy was significantly associated with psychological adjustment, the difference between perceived and actual heritage acculturation discrepancy correlations with psychological adjustment was analyzed. The difference between perceived and actual heritage acculturation discrepancy correlations with psychological adjustment was found to be not significant,  $t(15) = 1.95, p > .05$ . This suggests that actual and perceived heritage acculturation discrepancy are comparable with respect to their association with psychological adjustment. The hypothesis was not supported.

**Younger siblings.** Given that only actual and perceived heritage acculturation discrepancy were significantly associated with intercultural adjustment difficulties, only the difference between their correlations was analyzed. The difference between perceived and actual heritage acculturation discrepancy correlations with intercultural adjustment difficulties was not significant,  $t(15) = 1.48, p > .05$ . This suggests that actual and perceived heritage acculturation discrepancies are comparable with respect to their association with intercultural adjustments. The hypothesis was not supported.

### **Summary of Quantitative Results**

A summary of the research questions, hypotheses, findings and conclusion are presented in Table 23. The results of the present study reveal that perceived sibling acculturation discrepancy was not directly associated with psychological adjustment or intercultural adjustment difficulties. However, the relationship between sibling acculturation discrepancy and adjustment outcome was partially moderated by sibling conflict. Sibling conflict moderated the association between perceived heritage

acculturation discrepancy and intercultural adjustment difficulties. The relation was only significant for siblings who reported low sibling conflict.

Actual and perceived acculturation discrepancy between siblings was found not to differ significantly for either older or younger siblings suggesting that siblings accurately perceive the acculturation discrepancies between them. Further, actual and perceived acculturation discrepancy did not differ with respect to the strength of their association to psychological adjustment and intercultural adjustment difficulties.

Additional analyses revealed that Vietnamese and Chinese young adults in the present study differed mainly with respect to heritage acculturation level such that Chinese participants reported higher levels of heritage acculturation than Vietnamese participants.

Table 23

*Summary of Quantitative Results*

Research Question	Hypotheses	Results	Conclusion
1 Is Perceived Acculturation Discrepancy and Adjustment Associated?	Perceived Heritage acculturation discrepancy will be negatively associated with psychological adjustment  Perceived Canadian acculturation discrepancy will be positively associated with psychological adjustment  Perceived Heritage acculturation discrepancy will be associated with intercultural adjustment difficulties  Perceived Canadian acculturation discrepancy will be associated with intercultural adjustment difficulties	Perceived Heritage acculturation discrepancy was not significantly correlated with psychological adjustment  Perceived Canadian acculturation discrepancy was not significantly correlated with psychological adjustment  Perceived Heritage acculturation discrepancy was not significantly correlated with intercultural adjustment difficulties  Perceived Canadian acculturation discrepancy was not significantly correlated with intercultural adjustment difficulties	Hypothesis not supported  Hypothesis not supported  Hypothesis not supported  Hypothesis not supported
2 Does Sibling Relationship Quality Moderate or Mediate the relation between Perceived Acculturation Discrepancy & Adjustment?	Sibling relationship quality moderates or mediates the relation between perceived Heritage acculturation discrepancy and psychological adjustment  Sibling relationship quality moderates or mediates the relation between perceived Canadian acculturation discrepancy and psychological adjustment	Sibling conflict predicted psychological adjustment. No moderation or mediation effect.  Sibling conflict predicted psychological adjustment. No moderation nor mediation effect.	Hypothesis not supported  Hypothesis not supported

Table 23 cont'd

Research Question	Hypotheses	Results	Conclusion
2 Cont'd	Sibling relationship quality moderates or mediates the relation between perceived Heritage acculturation discrepancy and intercultural adjustment difficulties	Sibling conflict moderated the relation between perceived Heritage acculturation discrepancy and intercultural adjustment difficulties. No mediation effect.	Hypothesis partially supported
	Sibling relationship quality moderates or mediates the relation between perceived Canadian acculturation discrepancy and intercultural adjustment difficulties	Sibling conflict predicted intercultural adjustment difficulties. No moderation or mediation effect.	Hypothesis not supported
3 Do Vietnamese and Chinese Young Adults differ?	Vietnamese and Chinese young adults will differ on a number of study variables	Vietnamese and Chinese young adults differ mainly on heritage acculturation	Hypothesis partially supported
4 Do siblings misperceive acculturation differences?	Siblings will misperceive sibling acculturation discrepancies	The difference between actual and perceived acculturation discrepancy was not significantly different for older nor younger siblings	Hypothesis not supported
5 Is perceived or actual acculturation discrepancy related to outcomes?	Perceived acculturation discrepancy will be more strongly associated with psychological adjustment and intercultural adjustment discrepancies	There was no difference between the correlation coefficients of actual or perceived acculturation discrepancy and psychological adjustment or intercultural adjustment difficulties	Hypothesis not supported

### Qualitative Analysis

The qualitative component of this research is intended to provide contextual meaning to the quantitative portion of the study as well as to explore this emerging area of inquiry.

Qualitative data were comprised of the participants' responses to 8 open-ended questions. These were: 1) Describe in what ways your sibling is different from or similar to you in terms of your affiliation and identification with Vietnamese or Chinese culture; 2) Describe in what ways your sibling is different from or similar to you in terms of your affiliation and identification with Canadian culture; 3) Talk about how differences or similarities between you and your sibling on matters of Heritage (Vietnamese or Chinese) or Canadian culture has impacted your relationship; 4) How has your relationship with your sibling changed from childhood to young adulthood? Include a brief description of the nature of your relationship in childhood and compare it to your relationship with your sibling today; 5) Describe how your sibling has influenced your sense of well-being or ability to cope with life's stresses; 6) How has your sibling influenced your ability to deal with living in two different cultural contexts, the Canadian culture and the Vietnamese or Chinese culture?; 7) Describe any other important issues or experiences that are relevant to cultural differences between you and your sibling, and your sibling relationship that you would like to add; 8) Where do you consider home, Vietnam, China, Canada or elsewhere? Please elaborate.

The thematic analysis was conducted and resulted in seven themes of which only those relating to the specific research questions of the current study are presented. The complete list of themes are presented under Appendix H. The pertinent themes were: *a multi-factorial definition of acculturation, managing sibling acculturation differences and similarities, and sibling influences on living in two cultural contexts.*

#### **A Multifactorial Definition of Acculturation**

Four dimensions of acculturation emerged from the participants' responses that correspond with those identified in the acculturation literature: behaviours (e.g., language use, cultural events, food preference, entertainment preference), relationships (e.g., ethnicity of friends and romantic partners), values (e.g., respecting elders, cultural pride, individualism versus collectivism), and context (e.g., home versus school or work).

Interestingly, participants' responses indicated that they viewed acculturation as a varied and complex process that could not be defined by a sum of acculturation levels across the domains. Instead, acculturation level was defined within each dimension bilinearly (e.g., host and heritage behaviours, host and heritage relationships) and an overall evaluation of a sibling's acculturation level was rare.

I place more emphasis and effort towards maintaining heritage/cultural norms than my sibling. I also strive to learn more about my culture. I am more fluent in Chinese and Vietnamese than my sibling. His habits are more typical of a Chinese culture though; mine are more representative of Canadian/North American habits (how I dress, act, etc.). My chosen career field (Psychology) is also more typical among White Canadians than my sibling's chosen career field (Software Engineering). We both enjoy mainstream Canadian/North American media. We are both fiercely proud to be Canadian. In general, my relatives (both overseas and those who live in Canada) believe me and my sibling are "white-washed". However, I do exhibit more Canadian tendencies (in my choices) than my sibling. In contrast, I am more involved in Chinese-Vietnamese culture in terms of where I have worked and volunteered in the past (mostly involving Chinese heritage and inclusiveness). (23-year-old female)

### **Managing Sibling Acculturation Similarities and Differences**

**Mitigating the Impact of Perceived Differences.** While participants readily identified differences in acculturation between themselves and their siblings based on the qualitative data, these differences did not appear to impact the sibling relationship to the degree suggested in previous literature. Several participants were quick to point out that their relationship was not negatively impacted by differences in heritage or Canadian acculturation. Participants identified several strategies they employed to mitigate any negative impact of sibling acculturation differences. These included highlighting the positive consequences of acculturation differences, identifying instances of acculturation difference as insignificant or rare, offsetting acculturation differences with acculturation similarities.

The similarities and differences I believe has brought us closer together. Because I am more involved with our heritage culture, when she wants to be updated on music or movies from our heritage culture she turns to [me for] more advice. (24-year-old male)

Our relationship is negligibly impacted by our differences in our heritage and Canadian culture. Because we share many of the same Canadian values and have



the same Canadian interests, we get along well and can relate to each other. (22-year-old male)

**Differences as Insurmountable.** While most participants did not view acculturation differences as having a negative impact on their sibling relationship, some participants did report distance or conflict in the sibling relationship as a result of differences in acculturation that could not be mitigated. Negative consequences of acculturation differences such as sibling conflict tended to occur when participants viewed the differences as very significant or were critical of each other's acculturation-related choices.

I think with me, I adhere to a lot of more traditional expectations that is required when dealing with elders. I understand that there are certain customs that I should abide by in order to show my aunts, uncles, dad, mom, grandparents, etc., that I respect them. My sister however, is more individualistic and often thinks more about herself than the rest of the family. This has been one of the major sticking point in our relationship as we often butt heads over what roles we play in the family and when to bend to elders' expectations and when not to... As we got older, she and I diverged on our interests and goals so we are not that close either. (24-year-old female)

Another negative consequence of sibling differences in acculturation is the stress it caused the more heritage acculturated sibling because he or she would often be required to mediate between parents and the less heritage acculturated sibling.

Sometimes my brother's lack of concern for our heritage values has caused me more stress because I was often required to play the role of a mediator, trying to resolve differences between my brother and my parents. (25-year-old female)

**Reaching a Common Ground.** For the most part, participants were able to identify and focus on cultural similarities between themselves and their siblings. Further, participants viewed acculturation similarities between themselves and their siblings as having a positive impact on their relationship including increased sibling closeness, increased sense of security, source of emotional support, and having an ally against parents or relatives during conflicts related to acculturation.

The similarities of having a strong connection to Canadian culture allows us to have a stronger bond by allowing us to do many activities together. Things like, eating out, watching the same movies, having the same group of friends and overall communicating. (21-year-old female)

Growing up, we teamed up against my parents and argued with them when they didn't agree with our "Canadian" ways of acting and thinking that [they] were against our heritage values and traditions (e.g., dating, how to respect our elders, having our own opinions). So I think that brought us closer. (27-year-old female)

### **Sibling Influences on Living in Two Cultural Contexts**

Many participants reported that their sibling had some influences on their ability to deal with living in two different cultural contexts. Development of competence in different cultural contexts was influenced by their sibling in several ways including direct teaching of cultural knowledge, encouraging cultural pride, and role modeling.

My sister as well as other Canadian [born] Chinese friends have and show pride in our heritage culture. At the same time, she integrates well into the mainstream White-Canadian culture. Having examples reinforces my identity of belonging in both cultures. (28-year-old female)

This influence did not only occur in a top-down fashion with older siblings who are often viewed as more traditional or more acculturated toward the heritage culture affecting younger siblings, as is typically suggested in the literature (Pyke, 2005). The opposite pattern was noted by several participants.

My [younger] sister's success in being a part of the Canadian social scene has inspired me to strive towards being more comfortable in making friends and conversing with Canadians. I feel this is important for me because I plan to live here amongst them and because I want to feel more part of the main culture of this country. (22-year-old)

Some participants noted that their siblings did not influence their development of competence in different cultural contexts because they believe it to be an individual process or because their acculturation levels were too similar or too different from their siblings'.

She has not influenced my ability to deal with living in two different cultural contexts at all. In fact, I dealt with a conflicted identity (i.e. lack of pride in being Chinese and desire to be accepted by white Canadian culture) during high school. But through introspection and education (I read and continue to read extensive academic literature on the notion of identity and race relations), I have come to terms with living in two different cultural contexts on my own. (22-year-old female)

### **Summary of Qualitative Results**

The thematic analysis revealed seven major themes of which four were relevant to the studies research questions and quantitative findings. These written responses suggest that participants have a complex understanding of acculturation as occurring within several distinct dimensions. Siblings are aware of one another's acculturation level with respect to each of the dimensions and within the heritage and Canadian cultures. The way in which they evaluate each other's acculturation level occurs both bilinearly and multi-dimensionally leading to a complex understanding of acculturation and acculturation discrepancies. Siblings are also aware of the many acculturation differences and similarities between them and they generally view the differences as having little impact on the relationship and similarities as having positive consequences. Siblings employ several strategies to mitigate the negative impact of acculturation differences between them. Siblings are also aware of the ways in which they influence each other's adjustment in different cultural contexts.

## **CHAPTER IV**

### **DISCUSSION**

The purpose of the present study was to examine the relation between perceived bilinear sibling acculturation discrepancies and adjustment as well as to explore the possible moderating/mediating role of three dimensions of sibling relationship quality. Additional aims included: exploring differences between perceived and actual sibling acculturation differences and exploring differences between Vietnamese and Chinese young adults on key study variables. Qualitative analysis was included to assist with the interpretation of the quantitative findings.

This chapter presents a summary and discussion of the quantitative results in the view of existing research and the qualitative findings. The limitations of the study, general implications of the findings, and directions for future research are also discussed.

#### **Sibling Acculturation Discrepancy and Adjustment**

In the present study, acculturation discrepancy was not directly associated with adjustment outcomes as hypothesized. Neither perceived heritage nor Canadian acculturation discrepancy was related to psychological adjustment or intercultural adjustment difficulties for Vietnamese and Chinese Canadian young adults. This is in contrast to the parent-child acculturation gap literature that indicates that acculturation gaps are related to a variety of adjustment outcomes. This suggests that for young adult siblings, differences on bilinear acculturation have little bearing on their adjustment. It may be that the way in which acculturation was conceptualized in the present study could not adequately capture their experience. For instance, the qualitative findings of this study suggest that Vietnamese and Chinese young adults not only view acculturation as a bilinear process, but also as a multi-factorial process. Participants were able to very clearly identify differences in acculturation within several domains including language use and proficiency, food preferences, entertainment preferences, and social relationships. Further, few of the participants made general statements of their overall heritage or Canadian acculturation level as compared to their sibling. This finding suggests that the lack of association found between acculturation discrepancy and adjustment in the present study may be due to the way in which acculturation was conceptualized. The bilinear perspective of acculturation may not have been precise

enough to capture the complex way in which acculturation gaps may act on young adults' adjustment.

Few studies have looked at the differential contributions of acculturation gaps to adjustment from both a bilinear and multi-factorial acculturation perspective despite the preponderance of measures that have been developed in the last decade (Birman, Trickett & Vinocurov, 2002; Chung, Kim, & Abreu, 2004; Dere, Ryder & Kirmayer, 2010; Navas, Garcia, Sanchez, et al., 2005; Stephenson, 2000; Zea, Asner-Self, Birman & Buki, 2003). Two studies have examined bilinear and multifactorial acculturation gaps and family functioning (Birman, 2006; Ho, 2010). Birman (2006) looked at bilinear acculturation gaps in the dimensions of language competence, identity acculturation and behavioural acculturation using the Language, Identity and Behaviour Acculturation Scale (LIB; Birman et al., 2002). She found that actual US identity acculturation gap and not language use or behavioural acculturation was related to family conflict in a sample of 115 parent-adolescent dyads from refugee families from the Soviet Union. In a sample of 104 Vietnamese parent-adolescent dyads, Ho (2010) used the LIB and found that only actual Vietnamese identity was associated with family conflict. Miller (2010) compared combined bilinear and multi-factorial measurement of acculturation with unilinear and bilinear models. He found that the combined bilinear and multi-factorial (values and behavioural acculturation) model of acculturation was a more appropriate way to conceptualize acculturation with Asian Americans compared to unilinear or bilinear models. Together, these studies support the use of a combined bilinear and multi-factorial perspective of acculturation to better understand the role of acculturation gaps in immigrant adjustment.

For the sibling context, the use of a combined bilinear and multi-factorial model of acculturation discrepancies might be even more relevant than for the parent-child context. Research on acculturation level and generational status suggests that immigrants of the same generation are similar to each other on acculturation than to immigrants for different generations (Fuligni, 1998). The findings of the present study suggest that the acculturation discrepancies between siblings are likely to be smaller than those between parents and children given that siblings tended to be of the same generation. Indeed, the range of acculturation discrepancy scores obtained in the present study was restricted.

The possible range of perceived bilinear acculturation discrepancy scores was 0 to 80 in this study. However, the range of scores obtained in this sample for perceived Canadian and heritage acculturation discrepancy was only 0 to 30 and 0 to 46, respectively. Thus, the restricted range of scores on perceived bilinear sibling acculturation discrepancy in the present sample may have contributed to the failure to detect associations with psychological adjustment and intercultural adjustment difficulties (Tabachnick & Fidell, 2007). It may be important for future research to ensure variability of sibling acculturation discrepancy through inclusion of multiple generations of immigrants in the sample. The restricted range of acculturation discrepancy scores found in the present study may further support the use of a bilinear and multi-factorial measure perspective of acculturation. It is possible that acculturation discrepancies are higher for some domains than others. For example, perceived acculturation discrepancies may be high in the language proficiency domain whereas differences in food preferences may not be as apparent. Using a bilinear and multi-factorial approach to acculturation discrepancy may help to tease apart differential contributions to adjustment.

### **Sibling Conflict**

Based on the acculturation gap-distress model and limited previous research, it was hypothesized that sibling relationship quality would either mediate or moderate the relationship between perceived acculturation discrepancy and adjustment. Research question 2 was partially supported. Only sibling conflict was found to moderate the relationship between perceived heritage acculturation discrepancy and intercultural adjustment difficulties. That is, young adults who perceived high differences in heritage acculturation between themselves and their sibling tended to report poor intercultural adjustment, but only for those who reported having low conflict in the sibling relationship. This association did not hold for young adults who reported high sibling conflict. Young adults who experience low conflict with their sibling may be more likely to interact with them allowing more opportunities to learn from each other compared to those who reported high sibling conflict. Studies of naturalistic observations have found that siblings who exhibited high conflict in their relationships tended to spend less time with one another decreasing opportunities for them to observe one another, learn from one another and nurture the relationship (Brody et al., 1985; Stoneman, Brody &

McKinnon, 1984). Young adults in the present study who reported low sibling conflict may be more aware of acculturation differences between them making such differences more salient to their adjustment than those who reported high levels of sibling conflict. Sibling conflict has also been related to the developmental process of identity formation where it has been suggested that conflict with siblings and peers allows individuals to develop unique personal identities (Shantz & Hobart, 1989). Perhaps when sibling conflict is high young adults individuate from their sibling to such a degree that their sibling is no longer a valid cultural reference point for comparison of acculturation or intercultural adjustment.

It is interesting to note that only perceived heritage acculturation discrepancy (and not Canadian acculturation discrepancy) was related to intercultural adjustment difficulties. It may be that Canadian and heritage acculturation are attributed to different factors. Canadian acculturation tends to be related to the amount exposure to the host culture as a function of migration-related demographic variables such as length of residence or age of arrival to host country (Ryder et al., 2000). Heritage acculturation, on the other hand is related to the amount of exposure to the ethnic culture, which can vary depending on size of the ethnic community, access to ethnic events, or upbringing (Ryder et al., 2000). Young adult siblings may be more likely to be similar in Canadian acculturation than heritage acculturation level making differences in heritage acculturation more salient to intercultural adjustment difficulties. Indeed, young adults in the present study reported higher perceived heritage acculturation discrepancies than perceived Canadian acculturation discrepancies. Perhaps young adults struggle to reconcile perceived differences in heritage acculturation as the differences increase resulting in more difficulties with adjusting to two cultural contexts. The qualitative findings further reveal that young adults perceived more sibling similarities in Canadian acculturation than heritage acculturation. Further, the negative effects of differences in heritage acculturation tend to be mitigated through various coping strategies. This in turn reduces sibling conflict and increases the likelihood of learning cultural knowledge from each other. It appears that when differences in heritage acculturation are too great between siblings, young adults are unable to cope with them and high sibling conflict leads to distance in their sibling relationship. Thus, the qualitative findings provide

further support for the quantitative finding that perceived heritage acculturation discrepancy is related to intercultural adjustment difficulties for young adults with low sibling conflict.

Inconsistent with the acculturation gap-distress model was the finding that the proposed relation between perceived acculturation discrepancy and psychological adjustment was not moderated by sibling relationship quality. Instead, sibling conflict predicted psychological adjustment in this study. This suggests that for young adults' psychological adjustment, sibling conflict may be more relevant than acculturation discrepancies. This finding is in line with previous sibling research suggesting that the sibling conflict is an important factor in psychological adjustment at all stages of development (Bank, Patterson, & Reid, 1996; Garcia, Shaw, Winslow & Yaggi, 2000; Modry-Mandell, et al., 2007; Kim, McHale, Crouter, & Osgood, 2007; Pike, Coldwell, & Dunn, 2005; Stocker, 2000; Stocker, Burwell, & Briggs, 2002; Stocker et al., 1997; Yeh & Lempers, 2004). Previous research with young adults of various ethnic backgrounds including East Asians and Europeans suggests that while conflicts with parents and siblings occurs relatively rarely at this age, the conflicts are significant to psychological distress, happiness and feelings of guilt (Fuligni & Masten, 2004).

The qualitative data provides further insight into the lack of association between acculturation discrepancy and psychological adjustment. Participants identified several ways in which differences in acculturation were mitigated which reduced the likelihood of conflicts. While participants were aware of the acculturation differences that existed between themselves and their sibling they were able to ignore the differences, minimize them as rare or unimportant, or draw upon similarities to enhance the sibling relationship or decrease sibling conflicts. Acculturation discrepancies between siblings were not identified by participants as being significantly related to sibling relationship quality. It may be that psychological adjustment is related to normative developmental processes such as sibling conflict rather than to culture-specific differences between family members (Telzer, 2010) whereas intercultural adjustment difficulties is related to acculturation discrepancies.

### **Actual versus Perceived Acculturation Discrepancy**



The present study is the first to investigate both actual and perceived acculturation discrepancy in the sibling context. It was hypothesized that young adults would misperceive their sibling acculturation discrepancies based on previous research with parents and children. However, this hypothesis was not supported by the preliminary findings in the present study. Based on these findings, young adults appear to make accurate evaluations of the difference in bicultural acculturation between themselves and their siblings. Qualitative results support this finding and suggest that siblings are acutely aware of each other's acculturation level from childhood into young adulthood. Further, the participants seem to hold a complex and diverse understanding of acculturation such that sibling acculturation in young adulthood may be viewed very differently than in childhood or adolescence. It may be that qualities of the sibling relationship in young adulthood compared to childhood and adolescence improve siblings' ability to accurately perceive acculturation differences. For instance, previous research suggests that sibling conflict decreases and sibling warmth increases through adolescence and young adulthood (Buhrmester & Furman, 1990; Feinberg, et al., 2003; Sharf et al., 2005; Stewart et al., 2001; Stocker, Lanthier, & Furman, 1997). The decreased conflict and increased warmth between siblings over time allows them more opportunities to interact with one another (Brody et al., 1985; Stoneman et al., 1984). Further, young adult sibling relationships are characterized by changes in socio-emotional interactions including improved communication and greater acceptance and appreciation for one another (Roghaar, 1996). These qualitative changes in the sibling relationship over time may increase young adults' ability to accurately perceive acculturation differences between siblings. The preliminary findings suggest that using perceived acculturation discrepancy may be appropriate for use in the young adult sibling context.

An additional aim in the present study was to explore whether actual or perceived acculturation discrepancy was more strongly related to psychological adjustment and intercultural adjustment difficulties. Given the limited sample in the present study, comparison of dependent correlation coefficients was conducted. It was hypothesized that perceived acculturation discrepancy would be more strongly related to psychological adjustment and intercultural adjustment difficulties. The results revealed that actual heritage acculturation discrepancy was associated with psychological adjustment for

older siblings while both actual and perceived heritage acculturation discrepancy were associated with intercultural adjustment difficulties for younger siblings. Significance of difference testing revealed, however, that there was no significant difference between the dependent correlations for either older or younger siblings. The hypothesis was not supported. This suggests that perceived and actual acculturation discrepancies are comparable with respect to their association with psychological adjustment and intercultural adjustment difficulties. These results provide preliminary support for the equivalence of actual and perceived acculturation discrepancy in the young adult sibling context.

### **Differences between Chinese and Vietnamese Young Adults**

As an additional exploratory analysis, Chinese and Vietnamese young adults were compared on several study variables and were found to be different with respect to heritage acculturation level. Chinese participants reported higher heritage acculturation than Vietnamese participants. This finding may be explained by the differences in immigration patterns of these two groups. Vietnamese immigrants in Canada tend to be refugees of the Vietnam War while Chinese immigrants tend to immigrate to Canada voluntarily. The challenges faced by Vietnamese refugees as compared to Chinese immigrants could fundamentally change the family structure (Thomas, 1995). These challenges included learning a new language, finding employment, separation from family members, a diminished heritage community and a loss of hope of returning to the country of origin. These factors may have contributed to Vietnamese parents' difficulty of transmitting the heritage culture to their children as compared to Chinese parents who are less likely to be faced with these challenges (Buriel & DeMent, 1997; Chung & Bemak, 1998; Phan et al., 2005). Chinese immigrants arriving to North America around the same time as the Vietnamese refugees would have been incorporated into already existing Chinese communities that would support the maintenance of the Chinese culture (Phan et al., 2005). The short history of the Vietnamese in North America means they are more vulnerable to the impact of acculturation than other ethnic groups who have been in the host country for longer (Phan et al., 2005). Indeed, additional analyses revealed that Chinese participants were found to be older and to have resided in Canada longer than Vietnamese participants. Further, Chinese immigrants continue to settle in Canada in

much larger numbers than Vietnamese immigrants resulting in a continuous supply of first generation Chinese in the existing communities (Statistics Canada, 2006). Thus, Chinese young adults are likely to have been more exposed to their heritage culture more consistently than their Vietnamese counterparts, which perhaps explains the finding that Chinese participants reported more heritage acculturation than Vietnamese participants. This is consistent with previous research that suggests that host acculturation may be related to the amount of exposure to the host culture while heritage acculturation may depend on contact with own ethnic group or upbringing (Ryder et al., 2000).

This finding may also be explained by the process of ethnic identity development. This research indicates that positive feelings towards one's ethnic group (group-esteem) and exploration of ethnicity increases across the lifespan (Aboud & Doyle, 1995; French, Siedman, Allen & Aber, 2006; Smith, Levine, Smith, Dumas, & Prinz, 2009; Syed & Azmitia, 2009). Syed and Azmitia (2009) contend that ethnic identity development is an ongoing process that occurs across adolescence and into adulthood. They surmised that the ethnic diversity encountered in the college years forces young adults of various ethnic backgrounds to continue pondering their ethnic identity resulting in continued ethnic identity development throughout young adulthood. In the present study, Chinese participants being older than Vietnamese participants might have higher heritage acculturation levels than Vietnamese participants because they were more likely to be in the later stages of post-secondary training or to be employed. This would expose Chinese participants to more ethnically diverse environments which, in turn, might result in more opportunities to explore issues of ethnicity and to continue to develop their ethnic identity. Indeed, nearly 30% of Chinese participants were employed while only 15% of the Vietnamese participants were employed. Thus, the process of acculturation, particularly within the heritage domain, might be related to identity development.

In addition, post hoc testing revealed that sibling warmth also discriminated between Vietnamese and Chinese participants. Chinese participants reported more sibling warmth than Vietnamese participants. This finding is surprising given the importance of siblings in Vietnamese families (Rutledge, 1992). Given the paucity of research examining sibling relationship processes across different ethnic groups, the reason for this finding is as yet unclear. The difference in sibling warmth between these two groups

may be due to another variable such as sibling caretaking. One study found that more sibling caretaking in adolescence was related to more sibling warmth and closeness in a sample of Latino young adults (Brook, 1997). It may be that Vietnamese siblings engaged in less sibling caretaking than their Chinese counterparts thereby resulting in less sibling warmth. Without previous research specifically comparing these two groups, however, these explanations are purely speculative. Further research is necessary to better understand sibling relationship quality across different ethnic groups.

### **Implications of Findings**

The current study contributes to the scarcity of research investigating the role of siblings in the acculturation process of young adult immigrants. This present research is the first to examine the acculturation gap-distress model in the context of the young adult sibling relationship. Findings of the present study contribute to the literature by empirically testing associations between sibling acculturation discrepancy, sibling relationship quality and adjustment outcomes. Previous research on immigrant family adjustment has mainly focused on the parent-child relationship to the exclusion of the sibling relationship. As a result, little is known about the ways in which siblings contribute to family adjustment and individual adjustment. This study is the first quantitative investigation of immigrant adjustment in the sibling context. The findings support the extension of the acculturation gap-distress model to the sibling context, which has been called for in the literature (Costigan, 2010).

The results of this study demonstrate that young adult siblings do acculturate at differing rates from each other and that these discrepancies in acculturation relate to adjustment outcomes. In particular, only perceived heritage acculturation discrepancy was related to intercultural adjustment difficulties when young adults reported low sibling conflict in their relationship. This finding suggests that gaps in acculturation between young adult siblings on the heritage dimension are significant in developing a sense of competency to navigate both the host and heritage cultures. Previous research has suggested that intercultural adjustment is related to development of behavioural competencies in the host culture such as having English fluency (Yeh et al., 2008). The present study findings suggest that intercultural adjustment difficulties is an important outcome variable for understanding immigrant adjustment. Further research is needed to

understand the factors that contribute to intercultural adjustment difficulties in immigrant groups.

The extant literature on immigrant adjustment and acculturation has mainly focused on children and adolescents. This may be due to the view that significant developmental changes tend to occur in childhood and adolescence such as identity formation (Erikson, 1950). Later research on young adult or emerging adult development indicates, however, that development continues well beyond the adolescent years into the late 20's (Arnett, 2000). Arnett (2000) asserts that significant changes in identity occur in the emerging adult years across a variety of domains including work, love and religion. Findings of the present research indicate that cultural changes, particularly to the heritage culture, also continue into the emerging adult years. Indeed, some participants' qualitative responses revealed that they continue to explore their heritage culture and make decisions about their acculturation to both the host and heritage cultures. Further, these cultural identity explorations occurred across various domains similar to those identified by Arnett (2000). This suggests that psychosocial development and cultural change are interdependent and that a full understanding of immigrant adjustment must include a concurrent examination of both processes. Thus, acculturation and immigrant adjustment research should begin to shift its focus toward the rapidly growing population of emerging and young adult immigrants in Canada and other pluralistic societies.

The present research contributes to the sibling literature by providing support for the relation between sibling conflict and psychological adjustment in the context of Asian immigrant young adults. Relatively little is known about the family factors that contribute to psychological adjustment in various ethnic groups. The findings of the present study are consistent with previous sibling research and suggest that sibling conflict is related to psychological adjustment for Chinese and Vietnamese young adults with increasing conflict being detrimental to psychological adjustment. Interventions aimed at improving the psychological adjustment of young adults from Chinese and Vietnamese ethnic backgrounds may be enhanced by considering the contribution of sibling conflict.

Finally, the findings of the present study lend support to a combined bilinear and multi-factorial perspective of acculturation. Looking at acculturation as only a bilinear process may be misleading and obscure differential patterns of relationships among the

various dimensions of acculturation. For example, previous research has shown that Canadian acculturation is associated with psychological adjustment (Ryder et al., 2000). However, it may be that certain components of Canadian acculturation such as having Canadian friends or being involved in Canadian traditions are associated with psychological adjustment but not others. Findings of the present study suggest that lumping together the different components of acculturation obscures these associations. Thus, measures of acculturation which assess acculturation bilinearly within the separate dimensions (e.g., behaviour, relationships, values and contexts) should provide a more accurate picture of the acculturation process and allow for investigation of interactions between different components of both Canadian and heritage acculturation.

### **Limitations of the Study**

The results of the study should be viewed in the context of a number of methodological limitations. The generalizability of the findings of the present study should be considered carefully due to the following reasons. First, participants in the present study were mainly 1.5 and second generation immigrants. As noted in previous research, immigrants who were born and raised in the mainstream culture are more likely to acculturate to the mainstream culture than those who were born and raised elsewhere (Fuligni, 1998). It is unclear whether the participants of the present study are representative of the experiences of Vietnamese and Chinese young adults of other generations such as first generation, third generation and beyond.

Second, the majority of participants opted to complete the online survey. These participants may be different from those who did not opt to participate. For example, those who participated via online survey would have had to have access to the internet and be reasonably computer literate. As well, the current participants may have been more educated than non-participants and may have been more likely to reside in urban areas (Statistics Canada, 2006). According to Statistics Canada, 80.1% of the Canadian population in 2009 had access to the internet. However, upon closer inspection of the data, some provinces reported higher rates of internet access than others. For example, 81% of Ontario residents accessed the internet while only 69.1% of Newfoundland and Labrador residents accessed the internet in 2009. This suggests that while web survey allows for greater access to participants across Canada, access to the survey through the

internet may still be limited for individuals living in certain areas such as the Maritimes. The majority of participants in the present study resided in Ontario. Thus, the extent to which the results of the current study can be generalized to Vietnamese and Chinese young adults residing outside of Ontario is not clear.

Further, the present study was conducted entirely in English making it necessary for participants to be functionally literate in English. This precluded participants who did not have a solid grasp of the English language to complete such a survey. Thus, the study did not include the experiences of those who have lower English language proficiency and potentially higher heritage language proficiency. Findings of the present study may apply mainly to those with good English language proficiency. Future research could address this limitation by translating all study measures into the corresponding languages of interest in order to access a broader range of participants with different levels of heritage and English language proficiency.

The measures in this study were not administered in a counter-balanced fashion which could have contributed to order effects. For example, the VIA-self and the VIA-sibling were administered one after the other in this study to all participants. Participants were primed to think about their own acculturation level immediately before being asked to respond to the same questions from their siblings' perspective. The responses of the VIA-sibling may reflect participants' comparison of acculturation level between themselves and their siblings rather than from the perspective of their sibling irrespective of their own acculturation level. That is, participants may have been responding to the question, "What is your sibling's acculturation level relative to your own?" rather than "How would your sibling respond to this question?" Thus, the acculturation difference score obtained in the present study may not have been a valid representation of sibling acculturation discrepancy which might explain the lack of findings for the relation between sibling acculturation discrepancy and psychological adjustment or intercultural adjustment difficulties.

Generalizability of findings using data from sibling pairs may be limited by the small sample. Recruitment of sibling dyads was quite difficult which became clear early on in the recruitment process. The recruitment procedure and incentives were modified twice in order to obtain the current sample. It is possible that the results stemming from

the sibling pairs data could be attributed to other factors. For example, siblings who were willing to participate in the study together may have had more congenial relationships with each other than siblings who opted not to participate together. This could account for the similarity in perceived and actual acculturation discrepancy scores making generalizability of this finding to other siblings difficult. Thus, future research should replicate this portion of the study with larger samples. Doing so will allow for more robust results and the ability to use statistical procedures with more power to detect differences.

Another limitation of the study is that only sibling dyads were examined in order to simplify analyses given the complex nature of sibling research (Cicirelli, 1995). Sibship size in the present study ranged from 2 to 8. However, methodological constraints restricted data collection to only sibling pairs rather than from all siblings in a family unit. This is an important direction for future research since multiple sibling relationships may be interacting with one another in a complex process to impact upon individual adjustment and development. For example, participants with two or more siblings in the family who they perceive as different from themselves on acculturation may experience greater sibling conflict and subsequently more adjustment difficulties than participants with only one sibling. On the other hand, it can also be argued that participants with only one sibling may experience more adjustment difficulties than participants with more than one sibling because they have fewer siblings to turn to for support when other family relationships are unsupportive or inaccessible. Individuals with unsupportive sibling relationships may find support in other relationships such as friendships (Sherman, Lansford, & Volling, 2006). This adds an additional component of influence on the acculturation process. These considerations could not be investigated within the scope of the present study given that the unit of analysis was sibling dyads. Future research should examine acculturation outcomes within the context of all family members to gain a fuller understanding of the acculturation process for immigrant families.

Due to a technical oversight at the data collection phase of the study, a number of items from the intercultural competence concerns subscale of the CADC were not recorded in the database for the main sample. The remaining items were factor analysed



in order determine their suitability for use as a measure of intercultural adjustment difficulties. While the factor structure of the remaining items was consistent with the original measure, due to the missing items it may not have been a reliable measure of the intercultural adjustment difficulties construct. This may partly explain the lack of association found in the present study between acculturation discrepancies and intercultural adjustment difficulties.

The problem of measurement error due to technical difficulties in the use of web-based data collection encountered in the present study could be addressed in a number of ways. First, the web surveys should be pre-tested several times on different computers to ensure that the data is being recorded properly across several hardware and software configurations (Fricker & Schonlau, 2002). In addition to pre-testing, the database where responses are being recorded should be manually examined several times throughout the data collection process in order to ensure that data is being recorded correctly. Several online survey companies offer features that allow researchers to easily check their data for accuracy and completeness (Wright, 2005). Wright (2005) notes that one of the advantages of using an online survey company is that they allow less than technologically savvy researchers to create, administer, alter, and maintain web-based surveys with ease. For example, many survey companies offer researchers the ability to easily export their data to a statistical package at their own convenience rather than waiting for a computer programmer to do so for them. As well, some companies even offer researchers the option to track item responding in real time allowing researchers to detect and fix problems in data recording in a timely manner. These features allow researchers to easily check their data multiple times throughout the data collection process, which could reduce the likelihood of measurement error due to technical problems.

Finally, variables that were not examined in the present study might have been important to understand the role of siblings in the acculturation process. Bilinear acculturation differences between siblings were examined in the present study based on a broad concept of cultural changes encompassing several aspects of culture from food choices, to friendships, to entertainment preferences. However, previous research suggests that differences in individualism and collectivism between siblings contribute to sibling conflict (Pyke, 2005). Future research may wish to directly examine individualism

and collectivism in the immigrant sibling relationship in order to better understand cultural adaptation.

### **Future Directions**

Currently, acculturation research that examines the role of siblings is very limited. The findings of the present study indicate that siblings are an important part of the acculturation process for immigrant young adults. Thus, future research should explore the role of siblings in other immigrant groups where siblings may also play an important role. Other ethnic groups could be identified for future research by examining the values of collectivism and familism. These values have been found to differentiate between some ethnic groups (Freeberg & Stein, 1996). The term familism is a value that has been used to describe the strong interdependence between immediate and extended family members in Mexican American families (Ho, 1987). Familism has been found to be related to family relations, acculturation, and adjustment in individuals of Mexican and Latino/Latina descent (Gamble & Modrey-Mandell, 2008; Rodriguez, Mira, Paez, & Myers, 2007). More recent studies have looked at the role of familism in African American family relations and adjustment as well (Soli, McHale, & Feinberg, 2009). Collectivism is a term used to describe the emphasis individuals place on group goals (Triandis, McCusker & Hui, 1990). The values of familism and collectivism might lead to a greater emphasis on the sibling relationship in certain ethnic/racial groups such as Latino/Latina and Mexican American, and African American groups where collectivism and familism tend to be higher (Triandis et al., 1990).

In addition, partial support for the relation between sibling acculturation discrepancy and adjustment outcomes was found in the present study suggesting that while siblings do play a role in acculturation other factors are also important (e.g., parent-child acculturation discrepancy). Future research should examine both parent-child and sibling acculturation discrepancy simultaneously in the acculturation process to expand upon current theories of immigrant adjustment.

Sibling conflict became apparent as an important contributor to psychological adjustment for the young adult participants in this study. Sibling conflict also functioned as a moderator in the acculturation discrepancy and intercultural adjustment difficulties link. Clearly, sibling conflict plays an important role in immigrant adjustment and future

studies should continue to explore the ways in which sibling conflict functions to impact acculturation and adjustment.

The qualitative findings of the present study suggest that acculturation is a complex process that involves changes bilinearly and multi-dimensionally. Future research should explore acculturation from this framework in order to expand upon current acculturation models. Given the emerging nature of research in this area, continuous efforts to employ qualitative methods of research may elucidate additional domains important to the acculturation process for immigrant young adults (Tardif-Williams & Fisher, 2009).

Finally, the present study revealed differences in heritage acculturation between Vietnamese and Chinese immigrants. This suggests that acculturation experiences may differ between groups with seemingly similar cultural characteristics (i.e., being Asian, Confucian-based cultural ideology) due to diverse migration and settlement experiences. Thus, future research needs to investigate immigrant adjustment within distinct ethnic groups rather than lump similar groups into pan-ethnic categories.

### **Summary**

The relation between bilinear sibling acculturation discrepancy and adjustment outcomes in Vietnamese and Chinese young adults were examined in the present study. Sibling conflict was found to moderate the relation between heritage sibling acculturation discrepancy and intercultural adjustment difficulties. Sibling conflict was also found to predict psychological adjustment. The study extends previous literature on acculturation to include siblings as an important element in the acculturation process for immigrant young adults. Additionally, this study contributes to the acculturation literature by exploring the ways in which acculturation is viewed by 1.5 and second generation immigrants. The findings suggest changes to the current conceptualization of acculturation as either bilinear or multi-factorial but instead toward conceptualizing and measuring acculturation as a blend of both. Shifting toward a more complex view of acculturation will contribute to a greater understanding of the acculturation and adaptation process for immigrants in Canada and elsewhere and will lead to the development of more effective services for this growing population globally.

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## APPENDICES

## APPENDIX A

## Demographic Questionnaire

Please answer the following questions:

1. What is your age? \_\_\_\_\_
2. What is your date of birth? (month/day/year)\_\_\_\_\_
3. What is your gender? Male\_\_\_\_\_ Female\_\_\_\_\_ Other (please specify)\_\_\_\_\_
4. What is your heritage culture or ethnicity? Please choose one.  
 Vietnamese       Chinese  
 Other, please specify \_\_\_\_\_
5. What is your generational status? Please choose one.  
 1st generation (born outside of Canada & immigrated to Canada after the age of 12)  
 1.5 generation (born outside of Canada & immigrated to Canada before the age of 12)  
 2nd generation (born in Canada & have at least one foreign-born parent)  
 3rd generation (born in Canada and have at least one Canadian-born parent)  
 4th generation or later  
 International student born outside of Canada
6. What is your current citizenship status? (choose one)  
 Refugee       Landed Immigrant       Permanent Resident  
 Canadian citizen    Student Visa       Visitor's Visa
7. If you are not a Canadian citizen, what is your country of birth?\_\_\_\_\_
8. At what age did you immigrate to Canada?\_\_\_\_\_
9. How long have you been living in Canada? \_\_\_\_\_years \_\_\_\_\_months
8. What is your highest level of educational attainment?  
 elementary school       some high school       high school diploma  
 some post-secondary school (college or university)       college diploma  
 university degree       vocational school certificate (e.g., Trios, Everest)  
 some graduate or professional school       graduate degree (e.g., MA, MBA, PhD)
9. If you are in school, what is your primary area of study? (please check one)  
 Arts & Social Sciences       Science       Education

- Engineering                       Law                                       Nursing  
 Human Kinetics                       Other                                      If other, please specify:  
 \_\_\_\_\_

10. If not a student, what is your current occupation? \_\_\_\_\_

11. What is your personal annual income (independent of your family)?

Please choose one.

- less than \$10,000                       \$10,000-19,999                       \$20,000-29,999  
 \$30,000-39,999                       \$40,000-49,999                       \$50,000-59,999  
 \$60,000-69,999                       \$70,000-79,000                       \$80,000-89,999  
 \$90,000-99,999                       \$100,000 and over

12. What is your current living situation? Please choose the best one that applies.

- Living alone                                       With parent(s)                                       With sibling(s)  
 With roommate                                       With romantic partner                                       With children

13. In which city and province do you currently reside? \_\_\_\_\_

14. What is your current marital status? Please choose one.

- Single                                       Married                                       Common-Law                                       Co-habiting  
 Separated                                       Divorced                                       Widowed

15. How many biological siblings do you have? \_\_\_\_\_

16. What is your birth order? (e.g., first-born, second-born, etc.) \_\_\_\_\_

## APPENDIX B

## Sibling Demographic Questionnaire

To complete the following questions please identify a biological sibling (this may be a half-sibling) who you consider to be significantly *different* from you with respect to his or her affiliation to, identification with or involvement with either the heritage culture or Canadian culture.

1. What is your sibling's age?: \_\_\_\_\_
2. What is your sibling's gender? Male\_\_\_ Female\_\_\_ Other (please specify)\_\_\_\_\_
3. What is your sibling's generational status? Please choose one.
  - \_\_\_ 1st generation (born outside of Canada & immigrated to Canada after the age of 12)
  - \_\_\_ 1.5 generation (born outside of Canada & immigrated to Canada before the age of 12)
  - \_\_\_ 2nd generation (born in Canada & have at least one foreign-born parent)
  - \_\_\_ 3rd generation (born in Canada and have at least one Canadian-born parent)
  - \_\_\_ 4th generation or later
  - \_\_\_ International student born outside of Canada
4. How many years of your life have you lived with your sibling? \_\_\_\_\_
5. What is your sibling's birth order? (e.g., first-born, second-born, etc.) \_\_\_\_\_
6. What is your sibling's heritage culture or ethnicity? Please choose one.
  - \_\_\_ Vietnamese      \_\_\_ Chinese      \_\_\_ Vietnamese-Chinese
  - \_\_\_ Other, please specify \_\_\_\_\_

**7. Do you wish to recruit your sibling for participation? YES\_\_\_ NO \_\_\_**

If yes, please provide the name and contact information for your identified sibling in the space provided. This can be an e-mail address, telephone number or home address. This information will be held strictly confidential and secure.

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**You will be prompted to think about this sibling when you complete some of the questionnaires in this package.**

## APPENDIX C

## Mailed Recruitment Letter to Group Organizers

To whom it may concern,

My name is Trang Le and I am a doctoral student in the Psychology program at the University of Windsor in Windsor, Ontario. As part of my doctoral research I am conducting a study to look at the role siblings play in cultural adaptation and psychological adjustment among Vietnamese and Chinese Canadian young adults. My study involves completing an online survey comprised of a number of questionnaires and open-ended questions. The results of this study will contribute to my doctoral dissertation. This study has been approved by the Research Ethics Board at the University of Windsor.

To be eligible, participants must be between 18 and 29 years old, have a sibling between 16 and 29 years old, be Vietnamese or Chinese, and be residing in Canada. Compensation for their time is offered and is based on the survey they choose. There are two surveys that participants may choose to complete:

Survey 1: Individuals

Individuals who wish to participate without recruiting their sibling may fill out this survey. To participate, interested individuals can go directly to [www.uwindsor.ca/siblingrelationships](http://www.uwindsor.ca/siblingrelationships) to consent to participate and answer screening questions. After meeting study criteria they must enter the following information to access the survey: UwinID: sibling9 and Password: windsor. Compensation for their time is a chance to enter a draw for one of twelve \$25 gift certificates to Cineplex Odeon or Chapter's bookstore.

Survey 2: Siblings

Siblings who wish to participate must contact me, Trang Le, at [le4@uwindsor.ca](mailto:le4@uwindsor.ca). I will send both siblings the survey web address, password and a code to enter on the survey that will allow me to match sibling responses without use of identifying information. Thus, siblings will complete separate surveys so that they do not know each other's responses. Compensation for their time is \$10 for each sibling.

It would be greatly appreciated if you could pass on my study information to your members by posting the enclosed flyers on your bulletin boards, publishing my study details in your newsletter or on your website, or emailing study information to your members. If you have any questions please feel free to contact me at [le4@uwindsor.ca](mailto:le4@uwindsor.ca). Thank you very much for your time. Your assistance in my research is greatly appreciated

Sincerely,

Trang Le, M.A.  
Ph.D. Candidate  
Adult Clinical Psychology  
University of Windsor

## APPENDIX D

## Facebook Recruitment Message to Group Administrators

Hello,

I'm a graduate student in the Psychology Department at the University of Windsor in Windsor, Ontario, Canada. I am conducting a research study for my doctoral dissertation on the role of siblings in cultural adaptation and adjustment in Vietnamese and Chinese young adult living in Canada. At present, there is very little research on Asian groups living in Canada which limits the development of appropriate and effective services for Vietnamese and Chinese young adults in Canada.

So, for my study I am looking for sibling pairs, one of whom must be 18 to 29 years old and the other 16 to 29 years, of Vietnamese or Chinese ethnicity, and currently living in Canada.

Participation is completely confidential.

I would really appreciate if you could send the message below to the members of your Facebook group by clicking "message all members" in the left hand column of the group page. Also, it would be helpful if you could also participate if you are eligible and pass the message on to friends or family you think might be interested in participating it would be much appreciated.

This study is approved by the University of Windsor Research Ethics Board. If you have any questions or concerns please feel free to contact me at [le4@uwindsor.ca](mailto:le4@uwindsor.ca) or message me back.

Thanks,

Trang Le  
Principle Investigator

Dr. Ben Kuo  
Faculty Supervisor

**MESSAGE:**

As part of the University of Windsor's multicultural research program in the Department of Psychology, we are conducting a research study on the role of siblings in cultural adaptation and psychological adjustment among Vietnamese and Chinese Canadian young adults. This study has been approved by the University of Windsor Research Ethics Board.

We are currently seeking young adults (aged 18 to 29) who are of Vietnamese or Chinese ethnicity (or both) with at least one sibling (aged 16 to 29) and who are living in Canada to participate in our study. We were wondering if you would be interested in completing a short online survey.

There are two surveys you can choose from depending on whether your sibling would want to participate:

### **Survey 1 – Individuals**

If your sibling does not want to participate you can go directly to:

[www.uwindsor.ca/siblingrelationships](http://www.uwindsor.ca/siblingrelationships)

On the third page, you will need to enter the following to access the survey:

UwinID – sibling9

Password - windsor

As a token of our appreciation for your time and efforts, you will be entered into a draw for a \$25 gift certificate for Chapters (6 available) or a \$25 gift cards for Cineplex Theatres (6 available).

### **Survey 2 – Siblings**

If your sibling is interested in participating as well, send us an email directly to [le4@uwindsor.ca](mailto:le4@uwindsor.ca) containing both of your email addresses. You will then be sent an email with the survey website, the password, and a unique code that both you and your sibling will enter into your separate surveys. That way, you can complete your surveys separately and you will not know each other's answers.

As a token of our appreciation for your time and efforts, you will each receive \$10.

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For either survey, participation will take approximately 45 to 60 minutes (often less), and is confidential. If you choose, you can take a break at any point and finish the survey at a later time. There will be no way to trace your name or e-mail address to your answers on the survey.

Your participation in this research will contribute to the advancement of multicultural research, as there is currently little research on Asians and their siblings. Your participation will also give you the opportunity to gain some insight into your sibling relationships and cultural adaptation experiences.

If you are interested in participating in this study or have any questions, please reply to this e-mail (at [le4@uwindsor.ca](mailto:le4@uwindsor.ca)).

Thank you for considering participating. We would greatly appreciate if you could forward this e-mail to your friends who may be eligible to participate in this study. Thank you for your time.

Sincerely,

Trang Le  
Principle Investigator

Dr. Ben Kuo  
Faculty Supervisor

## APPENDIX E

## Web Survey Consent to Participate in Research – Main Data Set

**CONSENT TO PARTICIPATE IN RESEARCH**

Study: Sibling acculturation discrepancy, sibling relationship quality, and adjustment among Vietnamese and Chinese Canadian young adults.

You are asked to participate in a research study conducted by Trang Le (principle investigator) under the supervision of Dr. Ben Kuo (faculty supervisor) from the Department of Psychology at the University of Windsor. The results of this research will contribute to the principle investigator's Doctoral Dissertation. If you have any questions or concerns about the research please feel free to contact Trang Le at \*\*\*-\*\*\*-\*\*\*\* or Dr. Ben Kuo at 519-253-3000 ext. 2238.

**PURPOSE OF THE STUDY**

The purpose of this research study is to look at the role siblings play in cultural adaptation and psychological adjustment among Vietnamese and Chinese Canadian young adults

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to complete a web based survey. You can access the survey from any computer which has access to the internet. Please complete the survey in a quiet place where you will have few distractions. To ensure that your responses are as accurate as possible, please complete the survey on your own without assistance from friends or family members.

The questionnaires will take approximately 60 minutes to complete and you will have the opportunity throughout your participation to save and finish the survey at another time. You will also have the opportunity to end participation at any time without penalty.

- 1) If, after reading this consent form, you wish to participate in this study, please click on the 'I agree' button at the bottom of this page. By clicking 'I agree' you are indicating that you understand and agree to the terms under which this study is being undertaken. On the next page, you will have the option to print or email a copy of this consent form for your records.

2) After providing informed consent to participate in this study, you will be asked to complete a series of questionnaires and open-ended questions that involve a variety of questions concerning your acculturation experiences (behaviours, thoughts and feelings related to your affiliation towards your heritage culture and the Canadian culture), your perceptions of your siblings' acculturation experiences, the quality of your relationship with your sibling, the difficulties you have experienced within your heritage culture and the Canadian culture, and your psychological adjustment.

3) Upon completing the survey you will be provided with a list of referrals to counselling services should you have experienced any emotional or psychological reactions to participating in the survey. You will have the option to print this information or send a copy to your email.

4) Finally, you will be prompted to a web page where you will have the opportunity to enter your email address in a draw for a gift certificate to Chapters/Indigo bookstore (explained further below) or bonus marks towards psychology courses.

#### POTENTIAL RISKS AND DISCOMFORTS

Anticipated risks for participating in the current study are minimal. You will be asked a variety of questions regarding your acculturation experiences, relationship with your sibling, your psychological state and your difficulties with cultural adaptation. There is a chance that thinking about these topics may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss you will be provided with referral information for counselling services. You will also have the opportunity to speak with the principle investigator to discuss your concerns.

#### POTENTIAL BENEFITS TO SUBJECTS AND/OR SOCIETY

A potential benefit of participating in this study is the insight you might gain regarding your own acculturation experiences, your relationship with your sibling, and your psychological adjustment. Further, your participation in this study will be important in understanding how siblings contribute to the psychological adjustment of Vietnamese and Chinese Canadian young adults. For example, the results of this study may inform the practice of psychotherapy/counselling with ethnically diverse families and/or lead to the development of various programs for Vietnamese and Chinese immigrants in Canada. By understanding the variables which lead to psychological adjustment and intercultural adjustment difficulties, we will be able to suggest ways in which these difficult experiences can be minimized for this group.

#### PAYMENT FOR PARTICIPATION

You will be compensated for your participation in this study in one of two ways:

- 1) If you participated in this study through the University of Windsor participant pool, you will receive 1 bonus marks towards a participating psychology course



of your choice.

- 2) If you were recruited through other means, you will be entered into a draw for one of twelve \$25 gift certificates for Chapters/Indigo bookstore or Cineplex Theatres. The draw will take place after data collection has ended. It is anticipated that data collection will end in the Summer of 2010. Given this end date, please provide an email address that you will have access to for at least the next year.

## CONFIDENTIALITY

Your participation in this study will be confidential, but not necessarily anonymous due to the collection of your email address for entry into the draw for gift certificates to Chapters/Indigo bookstore or the assignment of bonus marks through the participant pool system. You will not be asked to provide your name in any of the questionnaires, and your responses will only be identified by a tracking number assigned when you begin the survey and your computer's internet protocol (IP) address. Your computer's IP address will only be used for the purpose of data organization, and it will not allow the researchers to identify you.

The data obtained from your responses and your identifying information will be kept in separate electronic password protected files on a password protected computer that only the principle investigator can access. Information that is obtained within the context of this study that can be identified with you will not be disclosed to other parties without your permission or used for any other purpose than for disbursement of incentives. After incentives are distributed, which is expected to occur in the Summer of 2010, your identifying information (i.e., email addresses) will be destroyed via permanent deletion from the computer hard drive.

## PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so (e.g., if you do not meet the study's eligibility criteria).

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

The findings of this research will contribute to the principle investigator's Doctoral Dissertation and therefore, will be available in the public record after its completion. As well, you may also view the results of this study on the REB web site at [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb) under 'Study Results'. The results of the study are expected to be available by October of 2010.

## SUBSEQUENT USE OF DATA

This data may be used in subsequent studies.

#### RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

#### SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

By clicking the button below, I indicate my understanding of the information provided for the study, *Sibling acculturation discrepancy, sibling relationship quality, and adjustment among Vietnamese and Chinese Canadian young adults* as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I agree to print or request an email copy of this page for my records. To request an email of this consent form please contact [le4@uwindsor.ca](mailto:le4@uwindsor.ca).

## APPENDIX F

## Web Survey Consent to Participate in Research – Sibling Pairs

**CONSENT TO PARTICIPATE IN RESEARCH**

Study: Sibling acculturation discrepancy, sibling relationship quality, and adjustment among Vietnamese and Chinese Canadian young adults.

You are asked to participate in a research study conducted by Trang Le (principle investigator) under the supervision of Dr. Ben Kuo (faculty supervisor) from the Department of Psychology at the University of Windsor. The results of this research will contribute to the principle investigator's Doctoral Dissertation. If you have any questions or concerns about the research please feel free to contact Trang Le at [le4@uwindsor.ca](mailto:le4@uwindsor.ca) or \*\*\*-\*\*\*-\*\*\*\* or Dr. Ben Kuo at 519-253-3000 ext. 2238.

**PURPOSE OF THE STUDY**

The purpose of this research study is to look at the role siblings play in cultural adaptation and psychological adjustment among Vietnamese and Chinese Canadian young adults

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to complete a web based survey. You can access the survey from any computer which has access to the internet. Please complete the survey in a quiet place where you will have few distractions. To ensure that your responses are as accurate as possible, please complete the survey on your own without assistance from friends or family members.

The questionnaires will take approximately 60 minutes to complete and you will have the opportunity throughout your participation to save and finish the survey at another time. You will also have the opportunity to end participation at any time and be eligible for partial compensation (explained further below).

- 1) If, after reading this consent form, you wish to participate in this study, please click on the 'I agree' button at the bottom of this page. By clicking 'I agree' you are indicating that you understand and agree to the terms under which this study is being undertaken. On the next page, you will have the option to print or email a copy of this consent form for your records.

- 2) After providing informed consent to participate in this study, you will be asked to enter the Code provided by the researcher. Then you will be asked to complete a series of questionnaires and open-ended questions that involve a variety of questions concerning your acculturation experiences (behaviours, thoughts and feelings related to your affiliation towards your heritage culture and the Canadian culture), your perceptions of your siblings' acculturation experiences, the quality of your relationship with your sibling, the difficulties you have experienced within your heritage culture and the Canadian culture, and your psychological adjustment.
- 3) Upon completing the web survey you will be provided with a list of referrals to counselling services should you have experienced any emotional or psychological reactions to participating in the survey. You will have the option to print this information or send a copy to your email.
- 4) Finally, you will be prompted to a secure web page separate from your survey where you will enter your mailing address to receive the monetary compensation by cheque. You will receive \$10 if your sibling also completed the survey. If your sibling did not complete the survey, you will receive \$5. If you decide to discontinue the survey you will receive the opportunity to enter a draw for one of twelve \$25 Chapter's bookstore or Cineplex Theatres gift certificates.

#### POTENTIAL RISKS AND DISCOMFORTS

Anticipated risks for participating in the current study are minimal. You will be asked a variety of questions regarding your acculturation experiences, relationship with your sibling, your psychological state and your difficulties with cultural adaptation. There is a chance that thinking about these topics may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss you will be provided with referral information for counselling services. You will also have the opportunity to speak with the principle investigator to discuss your concerns.

#### POTENTIAL BENEFITS TO SUBJECTS AND/OR SOCIETY

A potential benefit of participating in this study is the insight you might gain regarding your own acculturation experiences, your relationship with your sibling, and your psychological adjustment. Further, your participation in this study will be important in understanding how siblings contribute to the psychological adjustment of Vietnamese and Chinese Canadian young adults. For example, the results of this study may inform the practice of psychotherapy/counselling with ethnically diverse families and/or lead to the development of various programs for Vietnamese and Chinese immigrants in Canada. By understanding the variables which lead to psychological adjustment and intercultural adjustment difficulties, we will be able to suggest ways in which these difficult experiences can be minimized for this group.

## PAYMENT FOR PARTICIPATION

In compensation for your participation, you will receive \$10 if both you and your sibling complete the study, \$5 if only you complete the study, and a chance to enter a draw to win one of twelve \$25 gift certificates to Chapters bookstore or Cineplex Theatres if you discontinue participation in the study. Compensation will be distributed shortly after both siblings complete the study, when one sibling discontinues the study, when recruitment is complete (the required number of participants is reached), or in August 2010 when recruitment ends. Given this end date, please provide a mailing address that you will have access to until August 2010.

## CONFIDENTIALITY

Your participation in this study will be confidential, but not necessarily anonymous due to the collection of your email address for entry into the draw. You will not be asked to provide your name in any of the questionnaires, and your responses will only be identified by a tracking number assigned when you begin the survey and your computer's internet protocol (IP) address. Your computer's IP address will only be used for the purpose of data organization, and it will not allow the researchers to identify you.

The data obtained from your responses and your identifying information will be kept in separate electronic password protected files on a password protected computer that only the principle investigator can access. Information that is obtained within the context of this study that can be identified with you will not be disclosed to other parties without your permission or used for any other purpose than for disbursement of incentives. After incentives are distributed, which is expected to occur in the Summer of 2010, your identifying information (i.e., email addresses or mailing address) will be destroyed via permanent deletion from the computer hard drive.

## PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time and be eligible for partial compensation (please see Payment for Participation). You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so (e.g., if you do not meet the study's eligibility criteria).

## FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

The findings of this research will contribute to the principle investigator's Doctoral Dissertation and therefore, will be available in the public record after its completion. As well, you may also view the results of this study on the REB web site at [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb) under 'Study Results'. The results of the study are expected to be available by October of 2010.

## SUBSEQUENT USE OF DATA

This data may be used in subsequent studies.

## RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

## SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

By clicking the button below, I indicate my understanding of the information provided for the study, *Sibling acculturation discrepancy, sibling relationship quality, and adjustment among Vietnamese and Chinese Canadian young adults* as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I agree to print or email a copy of this page for my records. To request an email copy please contact [le4@uwindsor.ca](mailto:le4@uwindsor.ca).

## Appendix G

## Post Hoc Probing of Significant Interaction in Multiple Regression

Rearranged Simplified Regression Equation:

$$\begin{aligned}
 Y &= b_0 + b_1X + b_2Z + b_3XZ + b_4A + b_5B + b_6C \\
 Y &= (b_1 + b_3Z)X + (b_2Z + b_0) + b_4A + b_5B + b_6C \\
 &= (1.78 + (-3.12Z))X + (4.36Z + 194.74) + (-37.78) + (-25.60) + (-49.92) \\
 &= (1.78 + (-3.12Z))X + (4.36Z + 194.74) - 113.30
 \end{aligned}$$

A = Canadian Acculturation (CA-self)

B = Heritage Acculturation (HA-self)

C = English language proficiency (EngLanPro)

Y = Intercultural Adjustment Difficulties (INTAD)

X = Perceived Heritage Acculturation Discrepancy (HA-DIS)

Z = Sibling Conflict (CON)

The following simple regression equations for centered data were generated:

Low Conflict, Z = -1 (one standard deviation below the mean)

$$Y = (1.78 + (-3.12Z))X + (4.36Z + 194.74) - 113.30$$

$$Y = 4.9X + 77.08$$

High Conflict, Z = 1 (one standard deviation above the mean)

$$Y = (1.78 + (-3.12Z))X + (4.36Z + 194.74) - 113.30$$

$$Y = -1.34X + 85.80$$

Six data points to plot the simple slopes of the regression were calculated:

Low Sibling Conflict

$$X_{\text{Low}} = -2 \quad Y = 4.9X + 77.08 = 67.28$$

$$X_{\text{Med}} = 0 \quad Y = 4.9X + 77.08 = 77.08$$

$$X_{\text{High}} = 2 \quad Y = 4.9X + 77.08 = 86.88$$

High Sibling Conflict

$$X_{\text{Low}} = -2 \quad Y = -1.34X + 85.80 = 88.48$$

$$X_{\text{Med}} = 0 \quad Y = -1.34X + 85.80 = 85.80$$

$$X_{\text{High}} = 2 \quad Y = -1.34X + 85.80 = 83.12$$

## Appendix H

### Additional Themes from Qualitative Analysis

#### **Siblings as Communication Aids**

While translating was not a topic that appeared very often in the participant's responses, it clearly played an important role for the siblings that subsequently impacted their family relations. Siblings who were less fluent in the heritage language relied on their more fluent siblings to effectively communicate with their parents. As is evident in the following excerpts, the siblings who are more fluent in the heritage language is not always the older sibling as had been suggested in previous literature (Pyke, 2005). This 23-year-old female participant explained how she relied on her younger sister to translate parts of her communications with their mother.

Its easier for her to speak vietnamese so sometimes she becomes my translator when we are having a conversation with my mom. Sometimes there are just words or topics that I wouldn't know how to explain to my mom in vietnamese

This role was not simply to assist with communication between other family members, but also served to maintain family harmony. Siblings who were more fluent in the heritage language were also called upon by family members to translate heritage cultural information as well. This was the role played by this 23-year-old female participant's younger sister. She wrote,

I recall a few times when my parents were upset at me for holding some (more Canadian) values about some topics, or considering a decision from an individualist point of view, that my sister would be able to interpret my parents' feelings and better explain them to me in terms of an 'Asian values' perspective.

With siblings playing this role, parents and children stand a better chance of understanding each other's differing cultural views and family harmony is more likely maintained.

#### **Differing Types of Sibling Support**

Participants reported a variety of ways their siblings provided support and influenced their psychological well-being ranging from giving no support to having emotional support to being a role-model. Those who reported that their sibling was not a main source of support tended to espouse the value of independence or sought support



from other sources. For example, this 21-year-old male participant described how his sister provided him with support in very circumscribed situations:

I usually cope with life's stresses on my own as I am independent when it comes to personal problems. However, my sibling does help to relieve stress when she coincidentally has a source or connection that is able to assist in me reaching my goals.

Similarly, an 18-year-old female participant wrote about how she coped with stress on her own:

Not much, I actually do a lot of self-discovery and self-mediation on my own so I know how to deal with stress on my own

This 26-year-old male participant identified a number of other relationships from which he derived support:

My influence for coping with stress did not come from my brother, but my own experience, friends, and parents.

Most participants identified that their sibling provided some type of support. Some participants reported that they felt secure in the knowledge that their sibling was always available to them even if they rarely accessed them for support. This 22-year-old female participant explained how having access to her older sister was a form of support:

Although we don't always see eye to eye, I do see her as someone that I could go to for help if absolutely necessary. This gives me a sense of security.

Another participant (22-year-old female) suggests that Vietnamese family values play a role in her older sister's readiness to provide her with support. She wrote,

My sister has helped me in pivotal times such as during break-ups or letting me stay over during late-night outings. Although our relationship isn't the closest, I'd always know that she'll be there for me if I needed her to be there. I suppose it comes with Vietnamese morals that family always comes first, which she supports. Therefore, on a daily basis, my sister has little influence over my sense of well-being or ability to cope, but when it comes to bigger issues, she does try her best to be comforting and give helpful advice.

The majority of participants reported that their sibling provided them with emotional support which included listening to their problems, giving advice and guidance, and providing encouragement. It seems unclear whether this form of support is a reflection of Canadian or heritage values. This 23-year-old female participant wrote:

She plays a vital role as a listener in times that I am stressed out or dealing with problems. She does not provide any solutions or help, but she is there to hear me vent.

Another participant, aged 21 years old, was grateful for her older sister's support:

She is my life line. I always turn to her when I have a crises happening in my life and she is so smart she always knows what to say to me to make me put everything into perspective. I wouldn't be the person I am today without her.

Some participants reported that their sibling provided them with financial support or resources. A 19-year-old female participant described the different resources her older sister provided to her:

from childhood, she took care of me and basically gave me everything. Now adulthood, she still takes care of me meaning of sometimes giving me money if i really need it and small details such as contacts and glasses. she also sometimes buys clothing for me.

Another 24-year-old female participant wrote about the resources her older brother provided her in lieu of emotional support:

My brother has not influenced much of my sense of well being. He is supportive by providing me resources (such as school supplies, or taking me out for dinner) but does not really support me emotionally. We do not really share our emotions

Overall, participants reported that their sibling was a source of support, either through emotional or material means. In contrast to previous literature, provision of financial resources was a less likely type of support reported by most participants.

### **Sibling Influences on Acculturation**

Siblings are not only aware of each other's acculturation levels but they also influence each other's acculturation paths by exerting pressure on each other to conform to either the heritage or Canadian culture. Participants identified that influences on their acculturation from their sibling occurred through explicit demands made by siblings acculturate to either the Canadian or heritage culture, or through comparisons of their own acculturation level with their sibling's. Both positive (cultural pride and increased cultural competence) and negative (decreased sibling closeness and feelings of shame or guilt) consequences of sibling influences on acculturation.

Yes, she always told me to not be ashamed of being Chinese when I went through that awkward teenager stage where I was trying to "find" and identify myself in the world. And now I embrace both my cultures! (18-year-old female)

I think that my Heritage culture is more pronounced because I feel as though hers is lacking. I feel like I may be compensating for her lack of "Chinese-ness". (22-year-old female)

An interesting finding from the qualitative data was that participants tended to report that their siblings had decreasing influence on their acculturation process as they transitioned from adolescence to adulthood due to either acculturation differences or the developmental stage.

We've gained more independence and are more determined to do separate things. We used to do similar activities if one of us got involved, but now we go our own ways. For example, if I preferred to play a certain sport, she would participate in a different activity instead. We stopped following each other. (21-year-old male)

### **Parental Influences on Acculturation**

Participant responses reflected an awareness of their parents' impact on their individual acculturation paths and the sibling relationship. Parents were typically viewed as a main source of heritage cultural knowledge as they would place direct pressure on siblings to participate in the heritage culture. A 25-year-old, second-born female relates that her older brother, "only visits our birth country when he is pressured to do so by our parents." Heritage cultural values were also encouraged by parents through the sibling relationship. An 18-year-old younger sister recalled how her father encouraged her and her older brother to have a strong sibling relationship.

I remember growing up and my dad really stressed the fact that it was important for us to always stick together. He really hated it when we got into fights.

It was apparent, however, that parental involvement in the sibling relationship was not always effective in the long term due to other influences and siblings often relied on their parents to maintain the sibling relationship. A 23-year-old female wrote of her distant relationship with her older sister.

Because I identify with Canadian culture and my sister identifies with Chinese culture, we have very little in common. We don't really have a relationship with

each other...But we do not email or call each other, unless our parents are involved or we need something from each other.

Parents also influenced their children's acculturation paths through their own acculturation experiences. This 26-year-old female participant described her close relationship with her younger brother and their parents' role:

There aren't that many cultural differences between me and my sibling that I am aware of. I think we are quite similar. A lot of the reason why we get along so well is probably because my parents straddle the "in-between" gap between Canadian and Chinese culture very well. Of course, they are much more "Chinese" than their children. They have more traditional attitudes about marriage, families, respect for those in authority and such, but they always treated us with respect and they always treated us equally, which is different from some other traditional Chinese parents that I know.

Thus, while siblings are an important part of the acculturation process, parents continue to play an integral role in their children's acculturation process.

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