

FROM A TYPOLOGICAL TO NETWORK UNDERSTANDING OF  
ACCULTURATION

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## Abstract

The focus of this research is acculturation in a multicultural student community. It used full-network analysis to investigate three questions: (1) Defining acculturation as formation of social relations, how did participants acculturate in a multicultural community?; (2) how well did they adapt?; and (3) what is the relationship between their ways of acculturation and their adaptation?

Given the salient cultural diversity in the community studied and its unique location on an island between the East and the West, it is believed that the combination of the dominant bi-dimensional theory and the social network analysis provided the best analytical framework. The study included a full-network online survey about two social relations among those within the community: who the participants socialized with and whom (up to six) they felt closest to. Out of 280, 150 members of the community responded to the questionnaire. Twenty-seven follow-up interviews were conducted to elicit insiders' views on the acculturation phenomenon.

The findings showed that this is a culturally diverse and cohesive community. Different patterns of social relations were observed in network visualization and analyzed as ways of acculturation at individual, dyadic, triadic, and group levels. In addition, unlike conventional wisdom, neither homophily nor proximity appeared to be the major mechanism for the formation of social ties in this community. Interviews suggested that the presence of cultural diversity, the institutionalized community events, and the student association's leadership are the major drives of intercultural friendship. Overall, the students adapted well socio-culturally, psychologically, and academically. The sociability of themselves and that of those they are connected to account for ~50% of the variance of their acculturation outcomes.

This study illustrated how a network understanding of acculturation can advance the theory by going beyond type categorization to a relational view. Its implementation demonstrated the potential of using networks as measures of acculturation in multicultural settings and how making networks visible itself might benefit those in the studied community. Limitations and future research directions were discussed to continue this effort of bringing culture and context back to acculturation research as called for.

# Table of Contents

Acknowledgements.....	i
Abstract.....	iii
Table of Contents.....	iv
List of Tables .....	vi
List of Figures .....	vii
List of abbreviations.....	viii
Chapter 1. Problem Statement.....	1
1.1. Context of the Study .....	5
1.2. Research Questions .....	7
1.3. Contributions and Limitations .....	9
Chapter 2. Literature Review.....	13
2.1. Acculturation Research.....	13
2.1.1. Bi-Dimensional Framework of Acculturation.....	16
2.1.2. Challenges to the Theoretical Framework.....	25
2.2. Social Network Analysis (SNA) .....	31
2.3. SNA in Acculturation Research .....	37
2.3.1. Antecedents of Acculturation Social Networks .....	37
2.3.2. Impacts of Acculturation Social Networks.....	43
2.4. Conclusion.....	51
Chapter 3. Method Statement.....	54
3.1. Study Design .....	54
3.2. Participants and Context.....	56
3.3. Data Collection.....	58
3.3.1. Pilot Study .....	59
3.3.2. Online Survey.....	61
3.3.3. Follow-up Interview .....	65
3.4. Data Processing.....	67
3.4.1. Network Construction.....	67
3.4.2. Non-Respondents and Missing Data.....	69

3.4.3.	Network Notation and Metrics .....	75
3.5.	Survey Data Analysis Procedure .....	78
3.6.	Interview Data Analysis Procedure .....	82
Chapter 4.	Data Analysis .....	83
4.1.	Population Demographics.....	83
4.2.	Acculturation Patterns in the Community Network .....	90
4.2.1.	Characteristics of the Community Networks .....	90
4.2.2.	Cultural Groups and Network Clusters .....	101
4.2.3.	Homophily and Proximity Effects.....	110
4.3.	Acculturation Outcomes .....	112
4.3.1.	Socio-Cultural Adaptation .....	113
4.3.2.	Psychological Well-Being .....	116
4.3.3.	Academic Performance.....	117
4.4.	Relations between Acculturation and Adaptation .....	118
4.4.1.	Structural Indicators in Networks .....	118
4.4.2.	Perceptions from the Participants .....	121
4.5.	Conclusion.....	126
Chapter 5.	Discussion.....	128
5.1.	Summary of the Findings .....	128
5.2.	Interpretation of the Findings.....	131
5.3.	Contributions and Implications.....	135
5.3.1.	Theoretical and Methodological Contributions.....	135
5.3.2.	Contributions to Practice .....	139
5.4.	Limitations .....	141
5.5.	Future Research Directions.....	143
Appendix A:	Online Survey .....	146
Appendix B:	Interview Protocol .....	155
References	.....	156

## List of Tables

Table 1. Research Literature Summary on Research Question 1 .....	42
Table 2. Research Literature Summary on Research Question 2 .....	44
Table 3. Research Literature Summary on Research Question 3 .....	48
Table 4. EWC 2012-2013 Participants by Region and Country .....	57
Table 5. Demographic Survey Items .....	61
Table 6. Interviewees by Region, Gender and Dormitory.....	66
Table 7. Survey Response Summary by Region .....	69
Table 8. Missing Data Patterns in Full-Network Construction.....	72
Table 9. Full Networks Constructed for Data Analysis.....	74
Table 10. Matrices Used in Data Analysis .....	74
Table 11. Basic Network Measures.....	77
Table 12. Tested Models on Mechanism of Network Tie Formation .....	80
Table 13. Variables and Measurements .....	81
Table 14. Interview Coding Scheme.....	82
Table 15. Survey Response by Regions .....	84
Table 16. Crosstabulation of Respose Status by Gender .....	86
Table 17. Respondents by Dormitory .....	87
Table 18. Religion: Family Tradition and Self-Practice.....	88
Table 19. Top 10 Languages Spoken by the Participants.....	89
Table 20. Structural Description of the SOCIAL Networks.....	91
Table 21. Socialization Occasions at the EWC .....	96
Table 22. Structural Description of the CLOSE Networks .....	97
Table 23. Normative Assortative Mixing in SOCIAL and CLOSE Networks.....	100
Table 24. Top 15 Markov-Clustered Groups in CLOSE Network.....	102
Table 25. Regression Models on Homophily and Proximity .....	112
Table 26. Missing Value Summary in SCAS .....	114
Table 27. Descriptive Statistics of SCAS by Item .....	115
Table 28. SCAS Summative Score Descriptive.....	116
Table 29. Descriptive Statistics of SOS by Item.....	117
Table 30. SOS Summative Score Descriptive .....	117
Table 31. Self-Reported GPA.....	118
Table 32. SCAS Regression Models .....	119
Table 33. SCAS Regression Model Coefficients.....	120
Table 34. SOS Regression Models.....	120
Table 35. SOS Regression Model Coefficients .....	120

## List of Figures

Figure 1. Typological and Network Representation of Cultures in Acculturation .....	10
Figure 2. Trend of Scholarly Publications Indexed with Acculturation in PsycINFO Database .....	14
Figure 3. General Framework for Conceptualizing and Studying Acculturation (Berry, 2003:20) .....	17
Figure 4. Illustration of Gordon’s Assimilation Topology.....	18
Figure 5. Berry’s Bi-Dimensional Model of Acculturation Strategies (Berry, 1999:14) .....	20
Figure 6. Acculturation Strategies in Ethno-cultural Groups and the Larger Society (Sam & Berry, 2010: 477) .....	21
Figure 7. Additional Host Society Dimension in Interactive Acculturation Model (IAM, Bourhis, Moise, Perreault, & Senecal, 1997:380) .....	22
Figure 8. Relational Outcomes of Host Community and Immigrant Acculturation Orientations (IAM, Bourhis et al., 1997:382) .....	23
Figure 9. Relative Acculturation Extended Model (RAEM, Navas et al., 2005: 27).....	24
Figure 10. Illustration of Tree-Type Categorization of Cultures in Research Literature Using Bi-Dimensional Acculturation Framework .....	29
Figure 11. Illustration of Study Design .....	55
Figure 12. Online Survey Screenshot 1: SOCIALIZING relation .....	63
Figure 13. Online Survey Screenshot 2: CLOSE relation .....	64
Figure 14. Comparison of Individual Attributes and Network Properties between Survey Respondents and Non-Respondents .....	71
Figure 15. Boxplots: Survey Respondents’ Age and Length of Stay in Hawai’i.....	85
Figure 16. Bar Chart: Survey Respondents’ Length of Stay by Entry Year .....	86
Figure 17. Pie Chart: Survey Respondents’ Ethnicity Composition .....	88
Figure 18. Graph: Community’s Full-Networks on SOCIAL and CLOSE Relations .....	99
Figure 19. Graph: Multicultural Clusters Visualized in 2-Mode Network.....	104
Figure 20. Graph: Simmelian Network Labeled by Country and Colored by Clusters (Ties representing the Number of Shared Friends between Two Friends) .....	107

## **List of abbreviations**

EWC: the East-West Center

EWCPA: the East-West Center Participant Association

QAP: Quadratic assignment procedures

SCAS: Socio-Cultural Adaptation Scale

SNA: Social Network Analysis

SOS: Schwartz Outcome Scale

UH: University of Hawai‘i at Mānoa

# Chapter 1. Problem Statement

*“The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them.”*

Sir William Bragg, winner of 1915 Nobel Prize in Physics

The “phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups” is termed academically as acculturation (Redfield, Linton, & Herskovits, 1936: 149). This complex and fascinating territory has attracted many researchers. Thanks to their continuous efforts, today we have documented numerous approaches, findings, insights, and reflections about people involved in this intercultural process. For example, theories were developed on how to think about the direction and stages of acculturation as well as its impacts as reflected in cognitive, behavioral and attitudinal changes. Empirical evidence accumulated about what leads to successful and smooth adaptation and what might cause bumpy and painful maladaptation. Nations and organizations were advised on policy making that could help accommodate people in cultural transition and conflict resolution. Reflections and debates on the academic issues and related social practices in turn led to more research. The current study is set out in this context and with the same spirit.

Over the past four decades, a research paradigm in acculturation research has been formed around the bi-dimensional framework proposed and continuously elaborated by John Berry and his colleagues (Berry, 1999, 2003; Berry & Annis, 1974). It is acknowledged by many as the most instrumental theoretical guide (Chirkov, 2009a; Nguyen & Benet-Martínez, 2013; Ward, 2008, 2013; Ward & Kus, 2012) and completely changed the way acculturation was perceived and understood. Previously, acculturation was treated as unidirectional with the end goal of complete assimilation into the host culture in all life domains. But Berry and his colleagues pointed out that other alternatives were possible as well. In their framework, heritage cultural maintenance and host cultural participation are treated as two orthogonal dimensions. So a choice made on one dimension does not affect that on the other, which resulted in a two by two model

structure with four options of acculturation strategies or modes. Those who choose cultural contact or participation over maintenance are categorized into the assimilation mode, which used to be the only option allowed in the uni-dimensional thinking about acculturation. The reverse of such choices (i.e., maintaining heritage culture and avoiding other cultural contacts/adaptation) put people into the separation group. Such are evident in the ethnic enclaves, such as Chinatown, Koreatown, little India, and little Saigon, etc., found in many host nations. Those who endorse both are termed as taking an integration strategy. The rest are considered as the marginalized as they do not have a strong affiliation with either culture.

Compared to the uni-dimensional models, the bi-dimensional understanding of the acculturation process has several advantages. It offers an expanded explanation framework that could account for alternative approaches observed in immigrants and sojourners' acculturation experiences. It is theorized in a straightforward and concise manner that allowed for easy adoption in empirical studies. It emphasizes the equal involvement of the acculturating group and the host group in the process by putting the interaction (i.e., orientation and actual behavior) between them at the center of the theory.

However, there are two issues that could not be handled easily following the conventional application of the bi-dimensional framework. Coincidentally both of them are present in this particular study.

The first issue concerns the assumption that only two cultures are on contact and each is monolithic within the larger social environment. The community of interest to this research is at the East-West Center (hereafter referred to as the EWC or the Center) in Honolulu, Hawai'i. It is a non-profit organization established by the U.S. Congress in 1960. Its goal is to foster mutual understanding and cooperation among the governments and peoples of the Asia Pacific region and the United States through research and education (<http://www.eastwestcenter.org/about-ewc/mission-and-organization>). Annually, it hosts about 300 graduate students from over 30 countries in its two residential buildings on the campus of the University of Hawai'i at Mānoa. Both international students and American students from the mainland and Hawai'i stay together and interact on a daily basis on various social events. Given its unique geographic location and the multicultural policy the Center endorsed, it is hard to define

the host culture as the mainstream American culture. This created a problem for operationalizing the host-culture dimension in the framework. It is possible to bifurcate the two issues as one heritage culture versus all the other cultures, but field observation reveals that such an aggregation does not capture the essence of the acculturation experience in this particular community. Participants do not hold the same attitudes towards different cultural groups they interact with. In addition, such an operationalization might only confirm the integration ideology and miss the nuance between different cultural groups.

The second issue poses a more fundamental challenge to the bi-dimensional framework. The understanding of each heritage-host bicultural relation separately and in comparison is useful and helpful, but the sum of them together does not constitute a fair representation of the acculturation phenomenon when there are more than two cultures in play. So, a study that considers all types of dyadic relations between different cultural groups is believed to provide a more accurate picture of the acculturation phenomenon than studies focusing on heritage-host pair relations only. Although the bi-dimensional framework has been instrumental in guiding the latter kind of studies, its typology does not leave room to theorize about the other types of relations, which are the key differentiating acculturation in a multicultural setting from that in a bicultural context.

Thus, this study turned to social network analysis (SNA), because it is not only able to handle the two issues summarized above, but also has had an impressive record of applications across disciplines and levels of analysis. This combination of SNA with social sciences has been called on earlier and expected to lead to a paradigm shift in many fields of study (Borgatti, Mehra, Brass, & Labianca, 2009; Robins & Kashima, 2008). Particularly for research about acculturation, the promises of SNA have also been hailed for decades (Kim, 1978; Rogers & Kincaid, 1981; Smith, 1997, 1999; Yum, 1988). The size and ethnic composition of individual's social networks have gradually getting more academic attention (Bhattacharya, 2011; Domínguez & Maya-Jariego, 2008; Froese, 2010; B. J. Kim, Sangalang, & Kihl, 2012; Smith, 2013), but these were mainly implemented as ego-network studies. This study takes the step further by implementing a full-network analysis to investigate acculturation, which by itself is worth pursuing.

In the theoretical framework of SNA, a phenomenon of interest is constructed using (human or nonhuman) agents as nodes or actors and relations between them as ties or links. Its focus on relations and positions instead of the agents (Marin & Wellman, 2010) and ability to test multilevel hypotheses in one model (Monge & Contractor, 2003) make it a suitable candidate for conducting this research. Specifically, network study does not assume groups based on membership labels but define them based on the actual interactional patterns suggested by the relational data. It also allows for the visualization of individual behavior not just the average. These advantages can help reveal the complexity in acculturation. Also, network analysis can take into consideration other intergroup relations present in the acculturation context, so those who are involved in the process (other cultural groups beyond the heritage-host pair) would no longer be absent from the research as the result of incompatibility with the theoretical framework.

On the other hand, the application of the network perspective does not require a complete break up with the bi-dimensional framework. All four acculturation modes theorized before can be translated into the SNA paradigm, and the inflexibility relaxed to include more intercultural relations that could matter to those involved. More unique questions about acculturation in a multicultural setting could be explored in this way. For example, what is the difference between people who are bicultural-oriented (culture-specific) and those who are multicultural-oriented (culture-general)? Should interacting with host-nationals only and interacting with people from many other cultures be considered as the same or different acculturation strategy? Does the latter (in a multicultural context) still qualify as an integration strategy? Does it make a difference in terms of adaptation whether a person is bicultural or multicultural? These questions can be investigated more thoroughly using the SNA method.

The critiques here are not made to discredit the bi-dimensional framework and models as “no text (no matter how generous the word allocation), nor figure (no matter how complicated), can represent every aspect of the realities of the acculturation process.” (Berry, 1997a:62). These critiques are presented with an aim to reflect on the challenges that a unique acculturation case has posed to the conventional analytical framework and to show how an interdisciplinary approach could continue the dialogue in new directions and with new questions.

The following sections moves from general discussion of the problems in acculturation research to describe the specific context of the current study. They then lay out the three research questions investigated. Finally, the contributions of this study to theory building and methodology innovation as well as implications for practices are summarized.

## **1.1. Context of the Study**

Today's technology has enabled greater mobility of people and resulted in diverse demographics in many places all over the world. As the phenomenon itself becomes more complicated, so should the research addressing the phenomenon. Rudmin (2003:6) brings home this point when he states that,

*“... as a result of the speed and ease of world travel, global communications, and international marketing, all humans, everywhere, are subject to acculturation processes, whether they know it or not and whether they like it or not. There are no contained societies or protected people isolated from intercultural contact or exempt from cultural change. It is scientifically and ethically wrong to presume otherwise in our theories, in the performance of our research, or in the presentation of our theories and research to the public.” (p. 6)*

Demographic research in the United States has found that ethnic minorities (i.e., African Americans, Hispanics, and Asians) in metropolitan areas are more integrated into the residential areas than before (Frey & Farley, 1996; Logan, Stults, & Farley, 2004; Logan & Zhang, 2010). A glimpse of the visualization at MigrationsMap.net (<http://migrationsmap.net/about.html>) also shows clearly that most of the countries in the world nowadays are hosts of immigrants from more than one country. Such a world-wide trend towards more culturally diverse demographics provides a macro-context for the need to conduct this study.

First of all, at the East-West Center, people from many different cultures live together and are inevitably involved in each other's acculturation experiences. Such a

situation is exactly where the world is heading, which makes it desirable to deepen our understanding through studies like this one in a similar context.

Secondly, as Brislin (1981: 329) noted, success stories are worth studying for appreciation of efforts facilitating intercultural relations and motivating continuous attempts. Simply given the Center's impressive world-wide alumni networks as the result of the many intercultural friendships formed there, it is worth documenting and investigating the students' acculturation experience in the community. Admittedly, the acculturation experience here is special given the geographical location and the institution's reputation and tradition. Yet, the goal of promoting intercultural relations is shared by many organizations and nations in the world as cultural diversity becomes the norm.

Lastly, the particular socio-cultural context at the East-West Center provides a unique opportunity to tackle the issues facing the dominant theoretical framework for acculturation research. Fong and Shibuya's (2005) review of literature on residential patterns in multiethnic cities noted that there is a stream of studies focusing on the effects of the presence of racial and ethnic groups in the city or neighborhoods on the residential segregation of these minority groups, but "the pairwise measure has circumscribed the theoretical development of residential segregation in a multiethnic context" (Grannis 2002, Reardon & Firebaugh, 2002). Thus, they argued that "given that residential patterns reflect group relations, the failure to explore residential segregation among minority groups can limit the full account of intergroup dynamics, especially among minority groups, in multiethnic contexts" (p. 288). A similar issue motivated the current study and its choice of full-network analysis. The same argument is made here: acculturation in a multicultural setting is different by kind, not by degree, from a bicultural context, and a full-network analysis is able to capture the differences.

With the general goals set and the reasons of choosing SNA paradigm to address the issues raised in the arguments stated, the following section further discusses the specific research questions explored.

## 1.2. Research Questions

In the field of acculturation, three questions have attracted the most scholastic attention and been investigated thoroughly: the strategies people use to acculturate; how well they adapt; and the relation between the way they acculturate and their adaptation outcomes (Sam, 2006). Theories and models developed from such research have deepened the public's understanding of the impacts of intercultural contact and interactions. They have inspired and guided numerous studies and policies aiming to facilitate those in cultural transition. But, some criticized the *acultural* and *acontextual* nature of applications (see Chirkov, 2009b) and called for efforts to go beyond the current framework.

This study addresses the same set of questions in a particular socio-cultural context, but uses the SNA approach instead of the conventional operationalization of the four acculturation modes. Such a choice is an attempt to complement the dominant framework and bring cultures and contexts back into the empirical picture.

The specific research questions are listed below:

**RQ1: Defining acculturation as formation of social relations, how did participants acculturate in a multicultural community?**

**RQ2: How well did the EWC participants adapt?**

**RQ3: What's the relationship between their acculturation and adaptation?**

**The first question** looks for structural characteristics and their explanations of the acculturation patterns based on the socialization and close friendship relations formed within the selected multicultural community. Berry's bi-dimensional model categorizes the identity strategies into four modes of acculturation in a discourse focusing on the dynamics between heritage and host cultures. Smith (1999) extends this logic to a network theory for acculturation, and proposed that "intercultural identity strategies are discernable within social network structure. (p. 646)" In other words, the conventional way of applying the four-fold model and the network approach are connected by their shared assumption of agent-based acculturation choices, but they operationalize the options differently. *Assimilation* and *separation* are two different types in the original model, but similar structurally as they both indicate the association (or lack thereof) with

a relatively homogeneous cultural group. They differ in whether the acculturating person's original culture or the host culture is dominant one. Similarly, *marginalization* could manifest in a network as socially less connected members because of their lack of identification with any specific culture. It is trickier with the *integration* mode. Clearly, connections in the network denote a degree of integration, but questions such as whether bi-cultural, tri-cultural, and n-cultural connections result in different integration modes in a culturally diverse context need to be explored.

Structurally speaking, the full-network design of this study allows the visualization and analysis of acculturation modes from the original model, but is not limited to those predefined categories. This is necessary and desirable for an exploratory attempt to go beyond the bi-dimensional framework. If the same classifications of acculturation modes are imposed, relations that might matter in the multicultural context but do not fit neatly into the typology could be missed again. Moreover, using the full network in analysis could also reveal the structural constraints and opportunities of the hosting community on the options for acculturation. Thus, it would be possible to see whether the third proposition of the intercultural network theory is plausible that “as socio-structural heterogeneity increases, the probability of acculturation increases” (Smith, 1999: 647).

**The second question** aims to quantify the outcomes of acculturation in two major domains: socio-cultural adaptation and psychological well-being. The former, pertaining to the ability to “fit in” or negotiate interactive aspects of the new culture, comes from the cultural learning framework for understanding cross-cultural transition. It is concerned about whether a person can function normally in a new environment. The latter, referring to psychological or emotional well-being, is best understood and interpreted in the stress-coping framework originating in research about “culture shock”. Research has indicated that the two adjustment outcomes, although interrelated, are conceptually distinct. Sociocultural adaptation, measured in relation to the amount of difficulty experienced in the performance of daily tasks, is more dependent on variables such as length of residence in the new culture, language ability, cultural distance, and the quantity of contact with host nationals. Psychological adjustment, operationalized in terms of depression or global mood disturbance, is strongly influenced by personality, life changes,

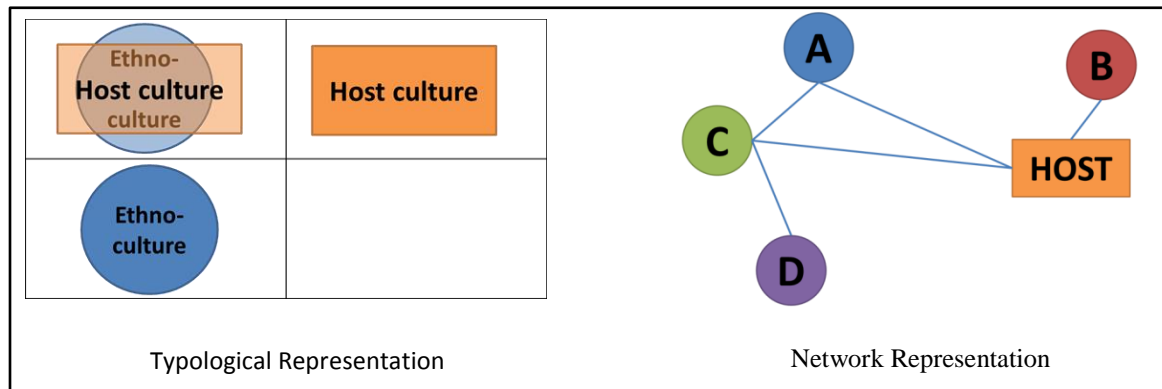
and social support (Searle & Ward, 1990; Ward & Kennedy, 1993, 1994, 1999; Ward & Rana-Deuba, 1999). In addition, as this is a student community, their academic performance is also considered as another indicator of their cultural adaptation in the educational domain.

**The third question** intends to link the structural characteristics identified by the first question to the adaptation status investigated in question two. Nguyen and Bennet-Martinez's (2013) study found general support for the positive relation between biculturalism orientation and integration, but the relation between other modes and adaptation outcomes are inconclusive. One reason for this result, as they pointed out, might be that most studies meta-analyzed in theirs did not include variables that account for the social contexts surrounding acculturating individuals. With a hybrid design that combines the theoretical framework of acculturation and the strength of network analysis, this study is able to explore the relations between acculturation and adaptation in a way that better incorporates the social contexts. In other words, the cultural composition and the cohesion of the acculturation networks bring the contextual influence directly into the equation, which is needed given the unique ecological environment in this case.

### **1.3. Contributions and Limitations**

As the old saying goes *when in Rome, do as the Romans do*, when entering a different socio-cultural context, people need to adapt. "Rome" as a hosting place for acculturation is not abstract, hypothetical, or homogeneous as it is often theorized about or treated in research. It is a specific, living, and complex community. Those who come into contact with the "Romans" may or may not belong to the same cultural groups; thus their interactions with each other and with the "Romans" (whom themselves might have been newcomers at an earlier time) together shapes what "the Romans do." In an increasingly diversified world, a step outside of the heritage-host pair analytical framework would allow for a more culturally sensitive and expanded vision to frame relevant issues. In this sense, the study responds directly to Ward's (2008) call for research outside of Berry's box. It offers a way to deal with the critics on the rigidity and limitation resulting from the typological or taxonomic nature of the bi-dimensional framework (Pick, 1997; Schönflug, 1997). This paradigmatic shift in the academic

understanding of the phenomenon in question is illustrated in Figure 1. More questions are raised when the common context for acculturation is multicultural rather than bicultural, and what is learned from this study will shed light on how they could be addressed in future studies.



**Figure 1. Typological and Network Representation of Cultures in Acculturation**

When cultures in a multicultural setting are represented in the bi-dimensional framework’s typology, they often appear as separate host-heritage dyads in analysis. Specific measures are developed for each pair in most studies. The network approach makes it possible to put together the ethno-cultures (A, B, C, and D) and the host culture in the same social context and visualize them side by side. This makes it easy to compare and contrast all cultures on the same ground. Moreover, by dropping the host-home dyad contrast and taking a relational network perspective, such an approach is able to account better for the complex nature of acculturation context today. Such a shift is significant for intercultural research in general as it echoes the call for studies “on the role that context of reception plays in the acculturation process (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). More questions are raised when the common context for acculturation is multicultural rather than bicultural and what is learned from this study shed light on how they could be addressed in future studies.

Methodologically, the present study creates a link between the old and the new paradigms as a response to the critiques. Thus, the exploration is able to reference explanations provided by the old model, to validate or question them, and, at the same time, is not confined by its limitations. The testing of such an approach will have a transformative impact on acculturation studies as it challenges the most popular mindset

in place now. As a result, the documentation of the procedures itself is of value to those who would like to pursue a similar line of research that integrates the strength of social psychology and social network analysis as recommended by Robins and Kashima (2008).

The findings from this study are in line with existing literature about the positive impacts of cultural integration on adaptation. But, they also point to new directions for theorizing about acculturation at both micro- and the meso-level using full-network analysis. Kuhn's (1996) observation of paradigm shift in the history of science suggests that the new paradigm should be able to draw the same conclusion as the old paradigm given the same input, but is also able to explain what the old paradigm cannot. It is hoped that the proposed theory could serve in the same way. The results also illustrate how full network analysis makes it possible to benefit from multi-level analysis, which is desired from the social ecological perspective in researching about human behavior in actual environment (Bronfenbrenner, 1994).

In addition, the findings about the particular community in this study deepen our current understanding of acculturation experiences as it takes into consideration the presence of local multicultural connections. The implementation of this research also demonstrates that those who took part in the data collection have already benefited from their participation. The results of the study shed light on how well the EWC is achieving its goal for cultivating multiculturalism, what issues or problems there are, and how the knowledge of the community network could help maintain such a healthy and integrated student body. Educators, community leaders, trainers, and consultants may draw insights from such an analysis and apply them to their own work with people of multiple cultural origins in acculturation.

However, these grand goals cannot be achieved single-handedly or in one shot. This study is an initial step to gauge whether the reframing of acculturation outside of the binary discourse makes a difference and how much insight it might inspire on ways to address questions about acculturation strategies and outcomes. Thus, the choice of the community is not concerned much with the generalizability of the results, but rather as a case for exploration. The testing of the SNA approach as an explanatory mechanism for acculturation and an alternative paradigm that goes beyond framing the phenomenon dichotomously are the purposes of this study, so shall its results be examined and

interpreted in this sense. Other limitations that pertain to the full network analysis are discussed in detail in subsequent chapters.

As the leading quote suggested, this study is not so concerned about “obtaining new facts”, but is exploring the “new ways of thinking about them”. The entry point for this study into the academic dialogue is the network representation and understanding of acculturation. This approach captures intercultural relations that could not be considered in the typology of the bi-dimensional framework. It also provides an example of an alternative methodological approach with regard to the measurement issues associated with the four-fold model. This network understanding of acculturation and what was found in this study are in line with the integration hypothesis, which is the most vigorously researched and debated in the bi-dimension framework. What’s more, it also demonstrates the potential for SNA approach to offer a broader and contextual vision for theorizing about acculturation, which could not be accommodated easily in the typological models.

## Chapter 2. Literature Review

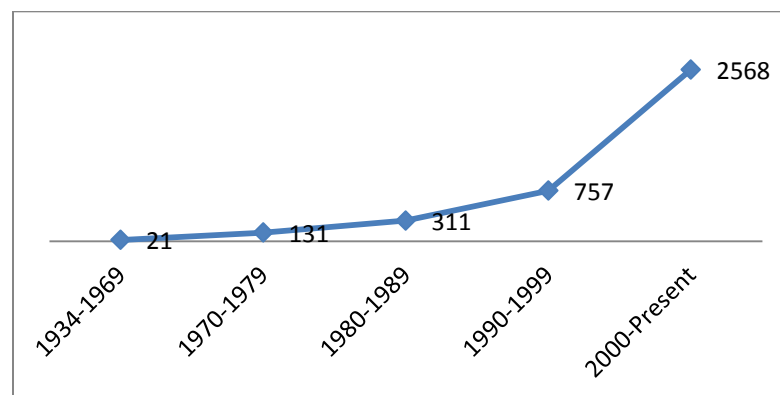
The first chapter states that this research is a study of the acculturation phenomenon in a particular socio-cultural context provided by the East-West Center in Honolulu. Relevant theoretical frameworks and empirical studies are reviewed in this chapter to show how a full-network analysis used in this particular case adds to the existing acculturation literature. This chapter starts from an overview of the field to gauge the current study and puts it into perspective. Then, the evolution of theoretical models and debates are reviewed to show what valuable understanding has been gained from decades of systematic research. The scope of the dominant framework and its limitations are also discussed. Following this, a digest of social network analysis (SNA) is provided to pave the way for paradigm shift. Previous attempts to apply SNA to acculturation research are then summarized and compared to the current study design. Altogether, this chapter reveals why such an alternative approach to study acculturation experience in a multicultural setting is not only necessary but also desirable theoretically and methodologically.

### 2.1. Acculturation Research

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) officially states, in its online thesaurus, that, “*Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups.*” This is a paraphrased version of the often cited definition given by anthropologists Redfield, Linton, & Herskovits (1936) in the *Memorandum for the Study of Acculturation*. Two decades after its publication, the Social Science Council Summer Seminar on Acculturation comes to a similar understanding of acculturation “*as culture change that is initiated by the conjunction of two or more autonomous cultural systems*” (Social Science Research Council, 1954). When the definitions used by prominent scholars are placed together, it is easy to see the shared consensus on the key elements that characterize this process. Sam (2006) summarizes it elegantly, in the first

chapter of *The Cambridge Handbook of Acculturation Psychology*, that the building blocks of acculturation are contact, reciprocal influence and change. First of all, acculturation results from contacts between culturally different people (be it at individual or group levels). Secondly, it has an impact on all who are involved, although to various extents. Thirdly, changes are likely to be observed in those who are involved in cognitive, affective, and behavioral domains.

The publication records in PsycINFO (see Figure 2) provide a good sketch of the academic interests in this phenomenon. This bibliographic database covers a wide range of journals, book chapters, and dissertations in psychology and communication which are the two most important publication platforms for acculturation research. “Acculturation” as an index term was assigned to 3,788 records in total (October 16, 2012). The number of publications by year is graphed in Figure 2. It shows clearly a soaring interest in this phenomenon from the academia since the 90’s. In fact, from 2005, there have been over 200 publications per year. Index terms that are highly associated with these publications include immigrant, ethnic identity, Hispanics (including Mexican Americans), and Asians. This gives a glimpse, to an extent, of which populations are the most studied and what concepts are often studied together in acculturation research.



**Figure 2. Trend of Scholarly Publications Indexed with Acculturation in PsycINFO Database**

The types of people that acculturation researchers have interests in are immigrants, refugees, asylum seekers, sojourners, and indigenous peoples (Sam, 2006). The immigrants and sojourners are the most studied groups. The difference between them is that immigrants expect to stay in the host culture permanently, while sojourning is a temporary state to accomplish tasks or goals such as business, education, humanitarian

aid, or military service. Business people assigned to overseas posts and international students constitute the two biggest portions of the sojourners. Their acculturation contexts sometimes differ considerably from immigrants given that they often function in only a few domains in the host country and there is much institutionalized support targeting them.

The outcomes of acculturation are normally termed as adaptation or adjustment. Researchers have found relationships between how individuals acculturate and how well they adapt (Sam & Berry, 2010). The outcomes of acculturation appeared empirically to be two independent but related domains: sociocultural (behavioral) and psychological (affective) adaptation/adjustment. The sociocultural adaptation is often measured by the skills acquired by the acculturating person so that he or she can fit in the new cultural community and behave properly. Thus, a social learning framework is useful for explanation. The psychological domain is better understood in terms of a stress-coping framework developed from clinical practices involving immigrants, refugees, or sojourners. It is often measured by general life satisfaction, depression, homesickness, etc. (Ward, 1996; Ward & Kennedy, 1993, 1999).

The process itself and subsequent changes incurred by the acculturation experience have been theorized and modeled in various ways. The first type is process oriented. One of the most known to the general public is probably the U-curve hypothesis (Oberg, 1960; Ward, Okura, Kennedy, & Kojima, 1998). Its graphic representation shows the ups and downs experienced by those in the process of acculturation, hence is it so named. The Developmental Model of Intercultural Sensitivity (Bennett, 1993) and the Stress-Coping-Growth model (Kim, 2008) are two other well-known examples.

A second type is typological by nature. The widely known and most used bi-dimensional (i.e., relation with heritage culture and relation with host culture) framework elaborated in the works of John Berry (Berry, 1999, 2003; Berry & Annis, 1974) and his colleagues is in this realm. This model categorizes acculturation attitudes, identity preferences, and behavioral orientations into types according to the four patterns of opinions on two issues: (1) whether it is preferable to maintain heritage/ethno-culture; (2) whether it is preferable to make contact with or adopt behavior of other culture(s). The interactive model developed by Bourhis and his colleagues (Bourhis, Moise, Perreault, &

Senecal, 1997) and the relative model by Navas and others (Navas, et al., 2005; Navas, Rojas, Garcia, & Pumares, 2007) both fall into this category as extensions of Berry's original model.

The third type is the component model. They normally include individual- and societal or cultural level constructs that matter in the acculturation context. Berry's framework for acculturation research (1997b, 2001), Ward, Bochner, and Furnham's (2001) ABC model (referring to the affective, behavioral, and cognitive aspects of acculturation) and Arends-Toth, Van de Vijver, and Berry's (2006) Framework of Acculturation are illustrative of this kind.

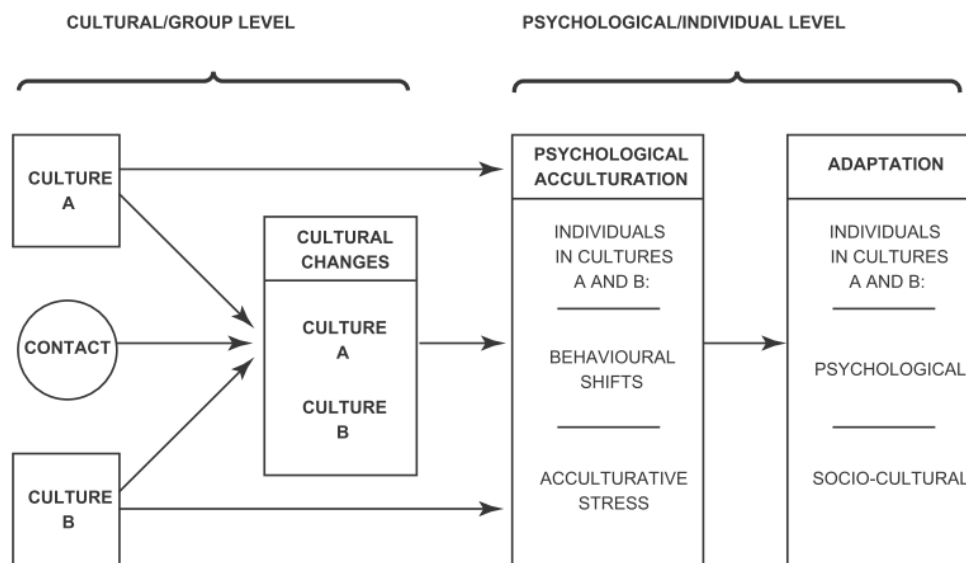
It is easy to criticize any of the models mentioned above as they all have limitations, but what should be kept in mind is that they all have functioned well in representing and explaining part of the phenomenon in focus. For example, the process models are good at capturing long-term trends in acculturation experience, be it cultural learning, emotional adjustment, or personal growth (e.g., Jackson, 2008; Pitts, 2009; Ward et al., 1998). The typological models define meaningful and generalizable rules that can profile or categorize acculturating behavior and people, and relate them to specific outcomes (e.g., Berry, Phinney, Sam, & Vedder, 2006; Nguyen & Benet-Martínez, 2013). The component models help the researchers keep in mind the big picture in designing and interpreting findings or developing theories. Taken together, these theoretical frameworks and models provide different angles to mirror the phenomenon labeled as "acculturation". What is not given attention to in one might be the focus of the other. The point is that all of them together contribute to an all-round understanding of what acculturation involves, implies, and influences. The current research is interested in finding out the relationship between acculturation behavior and its outcomes, and is most informed and inspired by the bi-dimensional framework. So the next subsection reviews in detail the evolution of this framework and its models.

### **2.1.1. Bi-Dimensional Framework of Acculturation**

A paradigm has formed in the scientific studies about acculturation with John Berry as the champion of the bi-dimensional framework. An understanding of the major models under this paradigm is essential for positioning the arguments of this study and

appreciating the suggested paradigm shift. Thus, this subsection reviews a number of acculturation models (Assimilation Model, Acculturation Model, Interactive Acculturation Model, and Relative Acculturation Extended Model) preceding or following Berry's four-fold model, to show the evolutionary changes in theorizing about this phenomenon.

Before proceeding to the specific models, it is important to keep in mind the general framework (Figure 3, Berry, 2003:20) that guided this line of theoretical thinking and discussion. This figure illustrates that acculturation takes place when two cultures come into contact, resulting in changes in different aspects and at different levels. Such dynamics are the most basic underlying mechanism for intercultural interactions and relations. It also clearly depicts a bi-cultural discourse (culture A vs. culture B), which has framed most of the academic dialogues in this line of research.

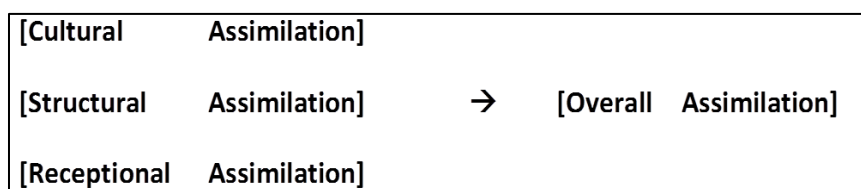


**Figure 3. General Framework for Conceptualizing and Studying Acculturation (Berry, 2003:20)**

One of the earliest models in this realm is developed by Gordon (1964, 1978) and named the Assimilation Model. It views acculturation as a “unidirectional” (Sam, 2006:17) process, or in today’s terminology, it equates acculturation to assimilation. According to Sam, assimilation and acculturation used to be two synonyms referring to the same phenomenon respectively by sociologists and anthropologists. But here assimilation is used to refer to one type of acculturation strategies following the major

paradigm’s convention, which means adopting the host culture completely. Immigrants are perceived as having only one preferable option to pursue if they want to adapt successfully—that is to assimilate into the mainstream host culture. Such a view is reflective of the socio-historical context after the two world wars when large numbers of immigrants and refugees flooded into the developed countries for political or economic reasons. They were, at that time, expected to blend in and leave their heritage cultures behind.

According to Gordon, assimilation into the mainstream culture is manifested in seven assimilation variables: (1) cultural and behavioral assimilation (speaking the host language and participating in activities of the host cultural tradition) happens first. Then, as an increasing number of immigrants merge into institutions of the host society, (2) structural assimilation takes place, which leads to (3) marital assimilation (intermarriage) and (4) identification assimilation (developing a new sense of identity). Finally, as a result of immigrants blending and merging into the host culture, there will be no separate groups as target for prejudice or discrimination, thus leading to (5) attitude receptional assimilation (absence of prejudice), (6) behavior receptional assimilation (absence of discrimination), and (7) civic assimilation (absence of value and power conflict). These variables in Gordon’s typology were later empirically categorized into three factors by Williams & Ortega (1990) as illustrated in Figure 4:



**Figure 4. Illustration of Gordon’s Assimilation Topology**

As research progresses, more and more studies notice that some immigrants choose not to assimilate into the host cultural norms, but are still able to thrive in the new culture. Others might choose to adopt some cultural practices and keep some heritage cultural behaviors of their own at the same time. Gordon’s model cannot offer satisfactory explanations for those situations because it does not see these as possible

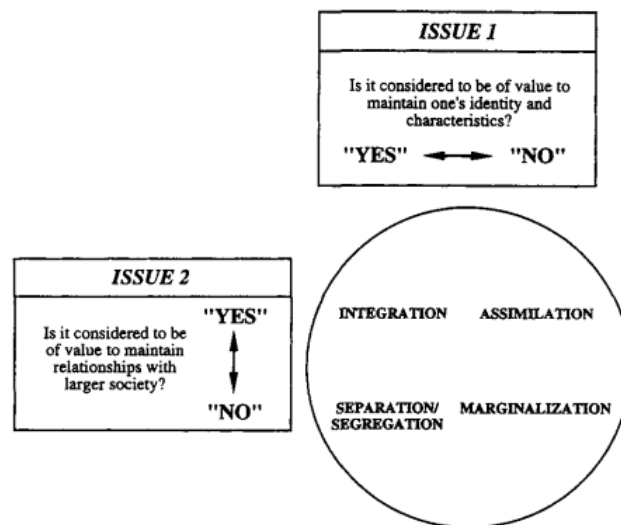
outcomes. Gradually, the legitimacy of one directional acculturation (assimilating into the dominant culture) as well as its uni-dimensionality (a tradeoff choice between host and heritage cultures) become questioned and challenged.

The problem is that the view of seeing home culture and host culture as competing with each other in a zero-sum game forbids the option of successful adaptation forms other than assimilation. In today's discourse, this model is getting more courtesy citations rather than being used as a guiding framework for the reason of not being "politically correct". However, such a line of thinking is still visible in some studies about acculturation. For example, the description of strangers' acculturation (acquiring new skills from and fit into the host culture) and de-culturation (unlearn or discard some heritage cultural practices) in Gudykunst and Kim's (1984, 1997) book reflects a similar logic by alienating the strangers and blaming them for failure in adaptation (M.-S. Kim, 2012; Kramer, 2000).

A breakthrough in thinking about the acculturation process is made when Berry's model was proposed (1974). His model revolutionarily puts orientation towards one's own culture and other cultures on two independent dimensions. This leads to a model specifying four types of acculturation strategies (see Figure 5, Berry, 1999:14). It moves away from the unidirectional understanding of expecting the immigrant group to conform to the mainstream culture in all possible aspects, and acknowledges the different strategies that might be pursued in acculturation as a result of larger sociocultural and ecological contexts.

The bi-dimensional framework and its operational model demonstrate good theoretical quality with its original, insightful, neat and parsimonious nature. In fact, Berry's theorizing of acculturation strategies (also referred to as modes) is widely acknowledged as the most prominent model used in this field (Chirkov, 2009a; Y. Y. Kim, 2000; Rudmin, 2003a, 2003b; van Oudenhoven, Ward, & Masgoret, 2006; Ward & Kennedy, 1999; Yoon, Langrehr, & Ong, 2011). Its great influence is evident given alone the impressive record of total citation of 1754 to his 24 publications in the PsycINFO database. A recent bibliometric study of publications on intercultural research (Chi & Young, 2013; J. Young & Chi, 2013) also identifies him as one of the top cited and most influential authors.

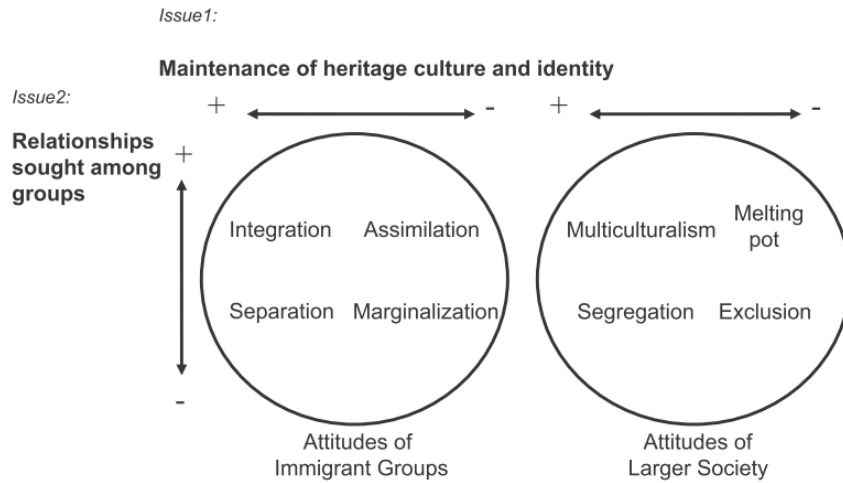
The four-fold model was first published in 1974 and has kept its 2X2 box or circle form for a long time (see Figure 5). Berry points out that there are two issues that affect how people acculturate: (1) relationships with one's ethno-culture (maintenance or not); and (2) relationships with larger society (contact/adoption or not). These have been operationalized as acculturation orientation, attitudes, identity preferences, or behavioral choices in empirical studies and respondents' choice patterns on the two dimensions can be categorized into the four types: integration (Yes, Yes), assimilation (No, Yes), separation (Yes, No), and marginalization (No, No). As Berry publishes more on consolidating and elaborating the framework, acculturation research is on the rise as well. Nowadays, this framework has been widely applied and systematically tested. A recently published meta-analysis by Nguyen and Benet-Martínez (2013) found a general empirical support across different studies for a positive relationship between integration (bi-culturalism) and optimal acculturation outcomes.



**Figure 5. Berry's Bi-Dimensional Model of Acculturation Strategies (Berry, 1999:14)**

One common concern raised by critiques about this model is whether immigrants have the autonomy to choose their preferred acculturation strategy or not (Horenczyk, 1997; Kağıtçıbaşı, 1997). Actually, Berry did theorize about the influence at multi-levels in a plural society (Berry, 1997b, 1999, 2003; Berry & Annis, 1974) and incorporated this host perspective dimension in his model, which was later visualized side by side to his bi-

dimensional model (see Figure 6, Sam & Berry, 2010: 477), but most follow-up studies that used this model failed to acknowledge that. A possible reason is the methodological challenge of including properly the micro-level (acculturating individuals) and macro-level (host country's multicultural policy) of analysis in one research.



**Figure 6. Acculturation Strategies in Ethno-cultural Groups and the Larger Society (Sam & Berry, 2010: 477)**

Bourhis and his colleagues' (1997) Interactive Acculturation Model (IAM) is one attempt to address this issue by looking at different matching possibilities between the acculturating group and the receiving society in their respective orientations. In IAM, the host society's reaction towards immigration and their attitudes towards acculturation are added to the original four-grid framework of Berry's as another dimension and are arranged in the same manner (see Figure 7). It is easy to see the similarity between these two representations.

Dimension 1:  
Do you find it acceptable that immigrants maintain their cultural identity ?

Dimension 2:  
Do you accept that immigrants adopt the cultural identity of the host community?

	YES	NO
YES	INTEGRATION	ASSIMILATION
NO	SEGREGATION	EXCLUSION INDIVIDUALISM

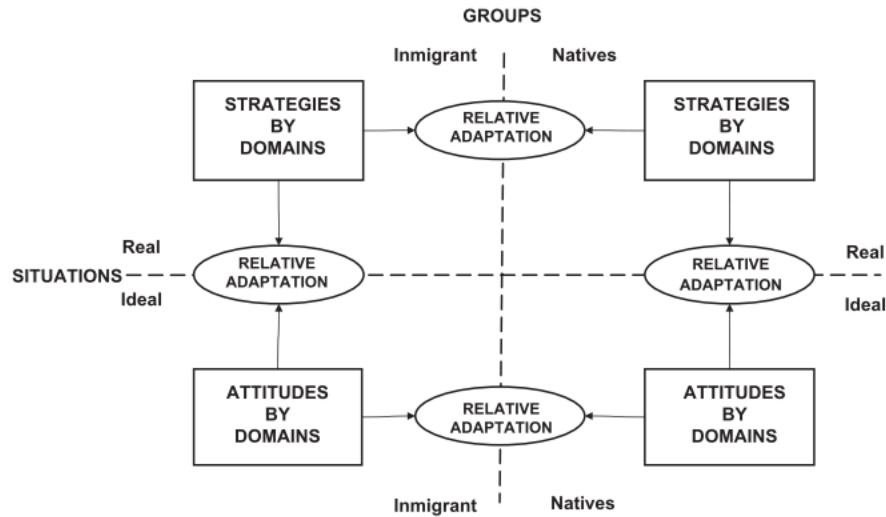
**Figure 7. Additional Host Society Dimension in Interactive Acculturation Model (IAM, Bourhis, Moise, Perreault, & Senecal, 1997:380)**

What is more interesting is that, for the first time, the relational outcomes of host community and immigrant acculturation orientations are articulated in this extended model. Bourhis and his colleagues categorized them as consensual, problematic, and conflictual relationship between the two groups (see Figure 8). Such theorizing on the interactive nature of acculturation has generated a large amount of studies focusing on the matches and mismatches of the orientations on the two sides involved in the process (e.g., Florack, Bless, & Piontkowski, 2003; Piontkowski, Florack, Hoelker, & Obdrzalek, 2000; Piontkowski, Rohmann, & Florack, 2002; Rohmann, Piontkowski, & van Randenborgh, 2008). The contribution of this model to the original one is that it emphasizes the fact that acculturation process and outcomes are the results of the interaction and tension between the two parties involved, so it makes a difference if their perceptions mismatch with each other. This helps shift the academic attention from mainly on the acculturating people to the interface between cultures and the question asked is what will happen when the two sides agree or disagree with each other on where the specific acculturation should head for. But whether this complex 5 × 5 matrix is a worthy trade-off with regard to the original model’s parsimony is arguable.

Host Community: Low-Medium High vitality group	Immigrant Community: low, medium vitality groups				
	Integration	Assimilation	Separation	Anomie	Individualism
Integration	Consensual	Problematic	Conflictual	Problematic	Problematic
Assimilation	Problematic	Consensual	Conflictual	Problematic	Problematic
Segregation	Conflictual	Conflictual	Conflictual	Conflictual	Conflictual
Exclusion	Conflictual	Conflictual	Conflictual	Conflictual	Conflictual
Individualism	Problematic	Problematic	Problematic	Problematic	Consensual

**Figure 8. Relational Outcomes of Host Community and Immigrant Acculturation Orientations (IAM, Bourhis et al., 1997:382)**

A further modification was later made to Berry's and Bourhis' model frameworks by Navas and his research team (2005, 2007), based on their research of a province in Spain that has two different immigrant groups. In addition to the juxtaposed views from immigrant and native (i.e., host) perspectives, the proposed Relative Acculturation Extended Model (RAEM, see Figure 9) adds two layers to the original one. First, it distinguishes the ideal attitude from real strategies as a response to the critiques regarding the freedom of choice the acculturating groups actually have. Secondly, it specifies seven specific domains (namely political, work, economic, family, social, and ideological contexts of acculturation), in which different orientations might be pursued or allowed. Similarly, such elaborations of the original model complement and enrich it at the cost of parsimony, so on some occasions, the extended parts are merits, but on other times, might not be.



**Figure 9. Relative Acculturation Extended Model (RAEM, Navas et al., 2005: 27)**

Together with the extension of the framework to include more contextual aspects of acculturation, scales for measuring the four strategies or modes have also undergone several changes. Two ways of measuring have been proposed: one uses two statements representing the two-issue dimensions; and the other uses four statements representing respectively each mode (Arends-Toth, & Van de Vijver, 2007). What are assessed in the measurements to categorize the four acculturation modes also vary across studies. Berry's original postulation is acculturation attitude, but identity and behavior (contact and adoption) are also used in many measuring instruments (Berry & Sabatier, 2011; Ward, 2013). Such inconsistency in measurement might explain the sometimes incoherent and conflicting conclusions in the application studies of this model as reflected in the title of Demes and Geeraert's (2014) paper on acculturation and adaptation instruments—"Measures matter".

In sum, Berry and his associates' theorization of the four acculturation strategies/preferences have inspired and guided many studies in this field. On the one hand, the model provides a convenient formula for acculturation research design and some of its propositions are empirically supported in certain social context. On the other hand, the structure of the model, the accuracy of its measurement, and its ability to capture a larger context are still being challenged constantly.

It is clear that these models demonstrate a path of evolution with several critical turns. The move from atheoretical documentations of intercultural contacts to the development of scientific theories and models (Sam & Berry, 2006; Ward, et al., 2001) is one. The theoretical contemplation of acculturation as a bi-dimensional process took the place of the previous uni-dimensional model is another one. The shift from focusing on acculturating personnel only to a more balanced system view is another (Y. Y. Kim, 2008). The four-fold model has been refined and expanded with the addition of (1) the matching and mismatching interaction between the host and the acculturating groups' perspectives; and (2) the various life domains where different acculturation strategies might be preferred. These mutations help generate more research and incorporate the critiques constructively. All of these have pushed the field forward and provided us useful tools and guidance in contemplating the acculturation phenomenon.

This study is mainly interested in how international students and American students in the same community interact as their way of acculturation, how well they adapt, and how their ways of acculturation in the community relate to their adaptation. The bi-dimensional framework and its various models reviewed previously are about the same type of questions and have informed the study design theoretically. The following sub-section reviews the critiques of and challenges to this theory as the reason of choosing social network analysis approach over its conventional implementation methods.

### **2.1.2. Challenges to the Theoretical Framework**

With the trend of globalization, what Ness and Kim (2001) reported as an increasing trend of a more diverse America in terms of race and ethnicity a decade ago has become true when the Census Bureau announced that “White births are no longer a majority in the United States” (Tavernise, 2012). Census 2010 in Australia (Australian Bureau of Statistics, 2011) also shows for the first time that one third of its population was born overseas. UNESCO points out that “awareness of this diversity has today become much more widespread, being facilitated by globalized communications and increased cultural contacts. While this greater awareness in no way guarantees the preservation of cultural diversity, it has given the topic greater visibility. Similar diversifying trends were noticed in the New Zealand’s census as well (Ward, Leong, &

Berry, 2009). “Cultural diversity has moreover become a major social concern, linked to the growing diversity of social codes within and between societies” (UNESCO, 2009:3). This inevitable and accelerating trend of multicultural or plural society (Ward & Leong, 2006) raises the challenge to acculturation research under the bi-dimensional framework: the mainstream culture of the receiving societies became harder to characterize as minority groups started to outnumber the used-to-be “dominant” cultural groups. In addition, the mix of cultures is taking place not just between the acculturating groups and the host countries, but also within and between different acculturating groups.

After years of cultural mingling across various immigrant groups and generations within a country like the United States, Canada, and Australia, what constitutes an American, Canadian, or Australian host culture is harder to define. The existence of the mainstream host culture is seldom examined nor is its uniformity as perceived by the acculturating groups validated. Kramer (2010) tapped on this issue by saying that “another unfounded presumption made by the original students of immigration is that the host society presents a monolithic ‘mainstream’ culture. This is denied by the presence of modern multicultural societies such as the United States. . . ., the reality of immigrant experience is a co-evolutionary process whereby the host culture and the sojourner communicate, that is, exchange, interpret, and borrow some of each other’s ways” (p.387).

With regard to the current study, the location of the community in Hawai‘i already questions the legitimacy of conceptualizing the host culture as mainstream American culture (i.e., often referring to the white middle-class American practices). As the middle point between the East and the West, with a complicated history of colonization and migration, even the locals have varied opinions about the detailed aspects of the host culture. Plus, there is native Hawaiian culture that is reviving and thriving, the international tourism culture that is commercializing the islands more and more, and the influence from the large amount of people and families stationed in the military bases. It seems impossible to reach a simple agreement on a host culture to be represented in statements used in measurement instruments.

Furthermore, it is also problematic to apply the bi-dimensional framework directly because field observations already suggest that inter-cultural relations between

different acculturating groups also play a role in the process. Theoretically, Berry and his colleagues made it clear several times that the existence of a dominant culture is not a pre-requisite of using this framework and it can accommodate more cultures (Berry, 1997a; 2009; Berry, 2013; Sam, 2006). But the way of handling multi-cultural contexts does not change much from that of bi-cultural situations, as they are simply treated as separate and independent heritage-host pairs in comparison with, not in relation to, each other.

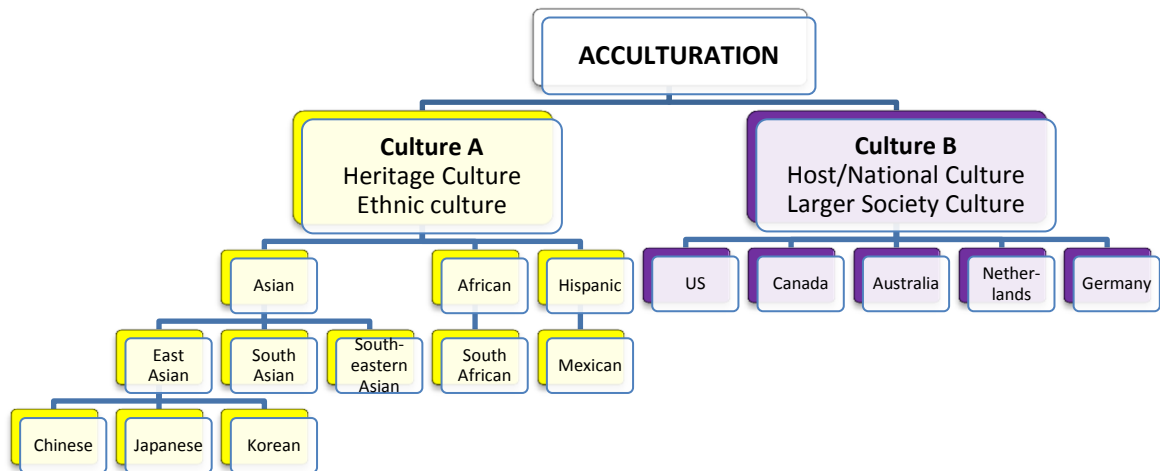
This dyadic treatment is frequently observed in the research literature that applied the bi-dimensional framework. Bi-cultural relations are the most frequently investigated because of their perfect fit to the four-fold models. When there are more than two ethnic cultures studied in one host country, they would either be considered separately with the host cultural group in comparison (e.g., the acculturation outcomes of the African-Caribbean pupils and the Bangladeshi pupils in Britain, in Bhui and his colleagues' study in 2005) or combined together as a larger cultural group (e.g., East Asian immigrants in Taiwan in Kuo, Chang, Chang, Chou, & Chen, 2013). When the interest is about the same ethnic group in different host countries, the researchers treat each pair as a separate unit of analysis as well (e.g., the Moroccan immigrants in Israel and the Netherlands by van Oudenhoven & Eisses, 1998). When the study is large enough to contain multiple ethnic groups and multiple host countries (see Berry, Phinney, Sam, & Vedder's grand project, 2006), both types of comparison analysis were done across host nations or between ethnical groups. What is worth noting is that the increased number of cultures in each study does not change their basic unit of analysis: the heritage-host dyadic pair.

The numerous measurements for acculturation developed for specific cultural groups illustrate this point as well. For example, there are acculturation scales for African Americans (Landrine & Klonoff, 1995), Greek Americans (Harris & Verven, 1996), Mexican Americans (Cuellar, Harris, & Jasso, 1980), the Chinese (Hsu, 2006), Puerto Ricans (Tropp, Erkut, Coll, Alarcon, & Garcia, 1999), the Vietnamese (Nguyen, von Eye, 2002), Asian Indians (Khairulla & Khairulla, 1999), and Eastern Asians (Barry, 2001). Even when the scale was designed for multicultural groups, such as the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA, Unger et al., 2002), it still defined the four modes in a similar way: Assimilation (United States Orientation),

Separation (Other Country Orientation), Integration (Both Countries Orientation), and Marginalization (Neither Country Orientation). In fact, Demes and Geeraert (2014) draws the same conclusion that “of the different approaches to the measurement of acculturation orientations, the bidimensional method is preferred. Limitations of existing measures are population specificity, lack of conceptual clarity, and methodological shortcomings.” (p. 94)

What is common in these studies is that only the dynamics within a host-heritage dyad are of interest and studied systematically. Multicultural contexts are simply dissected into bicultural relations and treated in an additive fashion (e.g., Peeters & Oerlemans, 2009; Phinney, Chavira, & Williamson, 1992). It is not wrong to do so as such approaches have increased our understanding of particular ethnical groups’ acculturation in different nation-state contexts and in comparison to other ethnical groups. Moreover, the primary goal of the bi-dimensional framework is to reveal the universal principles underlying different groups’ acculturation process. In that sense, this framework and models derived from it have the researchers served well. But, what is missing from the picture is the intercultural relation between those acculturating groups, as they could be an important factor given a culturally mingled context.

What is argued here is that such systematical overlook of multicultural interactions is due to the typological nature of the bi-dimensional model and its bifurcated hierarchical classification (see the color coded representation in Figure 10). The bi-dimensional acculturation framework theorizes the modes according to one’s orientation towards the in-group and/or the out-group. No matter how many cultures each of the two camps consists of, the inter-relations within each group are ignored or out of interest. In other words, the fundamental limitation of the bi-dimensional framework is that it leaves no room to theorize about relations between groups within the same camp if they matter in the process of acculturation.



**Figure 10. Illustration of Tree-Type Categorization of Cultures in Research Literature Using Bi-Dimensional Acculturation Framework**

Actually several studies mentioned briefly that their samples were collected from metropolitan areas where many cultures co-exist together (e.g., Bhui et al., 2005; Park-Adams, 1997). Then they turned to the classic typology to categorize the four modes of acculturation without attending to the fact that these different cultural groups coexist together in the acculturation process. Thus, it is worth asking how those left-out relations might have influenced the acculturation orientations and outcomes. For example, when Rohmann and his colleagues (2008) studied the two biggest acculturating groups in Germany by analyzing the Germans-Turks and the Germans-Italians respectively, the relationship between Turkish and Italian immigrants in Germany was not considered. Even when the research is about international students, who often have proportionally more contacts with other international students, most studies still only focused on the heritage-host dynamics (e.g., Chinese students in Australian universities; Vietnamese women students in American universities) or group them to a regional culture higher in the hierarchy as the opposite of the host culture (e.g., Asian students in Canada). Naming these practices is not to blame the bi-dimensional framework, but to point out that its four-fold structure is inflexible in that it cannot incorporate other types of interactions beyond the heritage-host dynamics.

As a response to these critiques, this study proposes that acculturation research should first study what interaction patterns exist in this particular multicultural

community and then decide whether a contrast between host and home cultures is meaningful in that context. In this way, researchers could develop a comprehensive understanding of the relations between all cultures present in the process of acculturation instead of imposing choices only about host and home cultural affiliation. This echoes with Chirkov's (2009a: 101) call that "the research approach should first try to follow the nature of the phenomenon we investigate." Also Halualani's (2008) study showed that students on a multicultural campus "have complex and multilayered interpretations of intercultural interaction that are shaped in part by surrounding ideologies of diversity, specific definitions of culture, and perceptions of the nationality, race, or ethnicity of their interactants" (p.1). Thus, this study intends to explore whether those involved perceived the co-existence of multiple ethno-cultural groups and how this composition diversity affects the acculturation behavior as well as its outcomes. Such an aim requires some paradigm-shift thinking and innovative methods to take into account of the multicultural relations rather than reduce some into bi-cultural ones and leave out the others.

To summarize, the mainstream acculturation research generally follows a bi-dimensional or multidimensional (Berry & Annis, 1974; van Oudenhoven, et al., 2006) framework with varying complexity in terms of variables covered. Although Berry argues that the framework does not require the host culture to have only one majority culture but contains several ones, the dichotomous discourse for discussion and the actual operationalization of the model appear to treat both the heritage and host cultures as respectively unitary. Many studies so far have focused only on the host-heritage pairs because of the typological structure of the guiding framework, but the plural reality of many receiving communities where various cultural groups coexist and interact with each other (not just with host members) do warrant more research to enrich and further our understanding of acculturation beyond the dominant discourse.

This study is a direct response to van Oudenhoven, Ward, and Masgoret's (2006) call for acculturation research to investigate pluralism as outcomes of culturally heterogeneous host societies. The review of the theoretical models and their critiques shows clearly the dilemma facing this case study. On the one hand, it seems to be a perfect case for testing the integration hypothesis in a multicultural context with a student

population. On the other hand, the sheer number of cultures involved makes it problematic and less desirable to follow most studies in operationalization. Such a dilemma calls for an unconventional approach that can go beyond Berry's boxes but still keeps its connection theoretically. Social network analysis is introduced in the next section as the alternative perspective, and specifically its usefulness for handling the problems laid out here.

## **2.2. Social Network Analysis (SNA)**

As noted earlier, acculturation is widely acknowledged as an interactive process taking place at multiple levels and may incur changes in all parties involved. To gain a comprehensive understanding of it, the individuals, their interactions with each other, the cultural groups in the same proximity of a local community, and the societies at large should be kept in mind. However, there are challenges to incorporate the immediate receiving community's features within the current paradigm, as it theorizes only about the relation between the heritage and the host cultural groups. Social network analysis, which is acclaimed as good at combining multilevel analysis in model testing (Monge & Contractor, 2003; Robins & Kashima, 2008; Smith, 1999), offers an alternative way out.

In social science, the root of the SNA perspective can be traced back to Simmel's argument in the early 20th century that the society is not a mass of individuals but is composed of relations and patterns of these relations. He believes that the forms (patterns of relations) are purely social while the contents are not. In his view, individuals are subject to the constraints and opportunities posed by the relational networks they are in, although he did not represent his ideas in mathematical format or graphically. Methodologically speaking, the invention of sociograms (graphical representations of social relations) is attributed to the psychiatrists Moreno and his colleague's study of the runaways of Hudson School girls in 1932 (Borgatti, et al., 2009; Freeman, 2004; Marin & Wellman, 2010; Oliveira & Gama, 2012). Today SNA has developed a large set of statistical methods, visualization tools, theoretical models, and explanation mechanisms that are widely applied to many fields from social networks to technological networks to biological networks (see Newman, 2010). In sum, with developments in graph theory, network visualization software, and information and communication technology, the

SNA perspective has demonstrated great potential for innovative research design and data processing power that adds value to conventional sociological and psychological research.

SNA brought to the study of social phenomena the possibility to quantify structural characteristics that were used metaphorically before, such as “cohesion” and “fragmentation” (Bandyopadhyay, Rao, & Sinha, 2011: 135). Marsden’s (1990) explanation of the SNA approach illustrates this point clearly:

*“Moving away from the use of the concept of a social network as a sensitizing metaphor and toward its development as a research tool, the approach seeks to describe social structure in terms of networks and to interpret the behavior of actors in light of their varying positions within social structure. Emphasis is on constraints placed by social structure on individual action and the differential opportunities—known variously as social resources, social capital, or social support—to which actors have access. (pp. 436-7)”*

A network is constructed by a set of agents/ nodes and a set of ties of certain types defined by the researcher. The ties could represent (1) shared location, membership, or attitude (e.g., co-citation, co-participation); (2) relations due to roles (e.g., supervisor and supervisee, parent and child); (3) relations due to perceptions (e.g., likes, knows); (4) interactions (e.g., talk to, get advice from); or (5) flows of things (e.g., information, disease). Nodes can have attributes that are innate to the individual agent only (e.g., gender, age). In other words, attributes are variables whose values do not depend on the network. For example, wages, titles, and marital status can be the attributes of employees in an organization. These attributes do not depend on whether the employees are studied in a network of advice-seeking, friendship, or collaboration. The relations studied can have directions if they are not reciprocal. They can also be valued as the strength of the same relationship might be contingent on who is connected to at the other end. There are two ways of studying networks: an ego-network approach, in which all nodes are related to one focal node and the nodes related to it are alters; and a complete or full network approach, which contains all nodes that satisfy a defining criterion of that network. The claims made in network research are often about (1) what leads to specific relational patterns (i.e., structure) observed in a network and (2) what impacts (i.e., opportunities

and constraints) the structure of a network have on the group or individual outcomes (Borgatti & Halgin, 2011).

According to Wellman (1983), the basic explanatory mechanism of SNA differs greatly from normative, categorical, dyadic, and bounded-group approaches often found in sociological analysis. Normative explanations, which treats shared and internalized social norms as the motives and causes for similar behavior, are common in psychology. SNA sees access to resources as more structurally determined, thus leaving less room for personal choices or motives. Constraints and opportunities inherent from a network structure are studied and used to explain social behaviors and the formation of social norms are considered to be dependent on and transmitted through social networks. Methodological individualism is another factor that is prevalent in traditional approaches but criticized by network analysts. Social categories that lump people together according to their individual attributes are often used as independent variables to account for social behavior similarities or differences. But “aggregating each member’s characteristics independently destroys structural information just as centrifuging genes destroys structure while providing information about composition” (White, Boorman, & Breiger, 1976: 734, as cited in Wellman, 1983). SNA aggregates people based on equivalent structural location rather than categorical membership so as to keep relational information found in social network structure. Moreover, SNA also treats dyads and groups differently. Traditional approaches analyze dyadic ties in isolation without considering other nodes and ties that are connected to the dyads in a larger network context. SNA will take either a “zoom in” or “zoom out” perspective when studying dyads. It is believed that other relations in the network affect a dyad’s behavior and the dyad’s relation has an impact on the network, too. Last, SNA analysts do not impose a priori grouping labels but rely on the structure itself to reveal the groups. This allows discoveries of social structure and flow of resources that may not be visible using formally defined groups. Many techniques have been developed to detect communities in social networks and statistical methods that are in line with SNA perspectives are also available (Fortunato, 2010).

Actually, in the two domains where acculturation is widely studied, the relational structural perspective innate in SNA is acknowledged as a promising trend that

complements previous research, but not without its limitations. In sociology, network analysis offers a more powerful way to structurally analyze relations beyond categorical attributes and “encompass both social structural and cultural perspectives on social actions”, but it requires sophisticated design to counterbalance “structural determinism” (Emirbayer & Goodwin, 1994). Emirbayer (1997) also argues that SNA allows for the reconceptualization of the macro-, meso-, and micro-levels of analysis as a continuum that can better capture a phenomenon of interest than single-level designs. Similarly, Robins & Kashima (2008:2) urges “a greater integration of social psychology and social network perspectives in future research” and that individualist and structuralist accounts be empirically tested together so that fair comparisons and critiques of either are possible. These general arguments about the benefits and limitations of SNA with regard to conventional paradigms in sociology and social psychology set the conceptual stage for the proposed study.

With regard to acculturation research, it makes sense to apply the SNA perspective as it is a multi-level process that involves relational development. For example, the concept of culture shock and the U-curve hypotheses that are often used to depict the acculturation process of expatriates or immigrants state that when people move into a new culture, there will be a short honeymoon period followed by a crisis stage, which brings the mental and physical well-being of the acculturating individual to the lowest point. Then after a recovery period, the person will finally adapt to the new environment. If perceived from the network perspective, this situation may actually correlate with the impacts of cutting off from one’s original social network as well as the time needed to reconstruct a new functional one. How and in which context the social ties are established, and where one enters the existing community networks (through which node and the role of that node in the whole network) are all worth exploring. Thus, the fact that the U-curve hypothesis is not well supported by empirical data (Ward, et al., 1998) is understandable. Possibly the variables regarding social network changes were not monitored in those studies and the constraints and opportunities contingent on the overall acculturation network structure were not considered in the explanation.

SNA’s focus on interactions and relationships as well as its integration of various levels of measurements and analysis also fits well the scope of acculturation studies.

“Cultures, like individuals, exist in relationship to one another” (UNESCO, 2009). In the early 1980’s, several writers foresaw that SNA paradigm may help advance acculturation research (Anderson & Christie, 1982; Y. Y. Kim, 1978; Rogers & Kincaid, 1981; Smith, 1999; Yum, 1988). J.K. Kim (1980) advocated an approach to acculturation studies focusing on the role of communication that treats interactions and relationships as the basic unit of analysis, which is exactly the essence of network analysis. He believes that the types and nature of ties in a network structure offers complementary and insightful explanations in addition to the dominant psychometric approach. Anderson & Christie (1982) and Rogers and Kincaid (1981) also had great confidence that the network approach offers an impetus for new research and initiatives about assimilation and integration in ethnic studies. Gudykunst and Kim (1984) posited that the ties with host nationals are instrumental to all aspects of cultural adaptation. Y.Y. Kim (1986) later proposed several theorems using social network features as indicators of different levels of host cultural communication competence and adaptation. For example, “the degree to which natives are incorporated into the [expatriate’s] personal network, the degree to which native ties are strong, and the degree to which they are central in network position, are considered to reflect, as well as facilitate, the [expatriate’s] host communication competence and adaptation.”

Fontaine (1986) proposed a module that incorporates developing social support systems into traditional intercultural training programs. Its uniqueness lies in the postulation of social support systems as both a content area of and a context for the training. Training programs are advised to help trainees understand the impact of sojourning on their social support systems and mobilize new support resources. He also suggested that the basic unit for training should go beyond “individual-level social skills” and focus more on other “more meaningful social units” such as the cohort, the work, and the family units. This is one of the earliest attempts to applying social network perspective in theorizing about intercultural training.

After almost a decade, based on extensive case studies, Smith (1997, 1999) proposed an intercultural network theory. In this theory, he predicts that the general intercultural network structure will reflect differences in identity preferences, cultural perceptions, and interpersonal relationship types (Propositions 1, 2, and 7). He also

specifies network measures that may be related to or indicative of acculturation modes and adjustment in terms of the nodes' heterogeneity, change rate in network composition, overall network size and density (Propositions 3, 4, 5, and 6). However, there has been little research published supporting these network theories (Gudykunst, 2002: 201). This is understandable as SNA itself was still developing then. It has a much bigger theoretical and methodological reservoir now. Descriptions of networks can use measures based on standard mathematical definitions. Statistical packages to test network related hypotheses and visualization tools have become more sophisticated and can be done using specially design network software. Thus, it is time to fully embrace the network perspective and its strength, to put the theories into practice.

Moreover, the acculturation experience has changed as a result of the boom of social media. The fact of being connected socially through physical and online platforms needs to be explored more as it affects the basic means of communication, establishing relationship, information sharing, and learning, all of which are the foundations for most theorizing about acculturation.

To summarize, it is believed that taking a network perspective inspires new questions to be asked and provides alternative explanations for some questions. At the same time, it should also be able to embrace the main body of knowledge obtained so far about acculturation. Otherwise, the value and the validity of the paradigm would be questionable. This study is proposed as a testing step in this sense. It is built upon earlier theorizing about acculturation, but will take advantage of the more developed SNA reservoir. It combines the attribute-oriented approaches from the current paradigm and the structure-oriented approaches from the SNA paradigm together into the research questions and hypotheses so as to create a channel between the two paradigms for more productive dialogue in the future. The next subsection explained in detail how the challenges to the bi-dimensional acculturation framework could be dealt with using the SNA.

Theoretically, it can be seen that SNA promised an innovative way to address the particular setting of acculturation in this case study. What aspects of acculturation have been studied using the SNA approach? The next section reviewed such studies and their findings in detail.

## **2.3. SNA in Acculturation Research**

Rogers & Bhowmik (1970) pointed out long ago that the use of relational analysis could inform and complement an individual approach or “aggregate psychology” as Coleman put it. SNA is fundamentally about relations. “Social network theory is about describing, accounting for, or even predicting interactions between social units that could be people, groups, organizations, countries, ideas, social roles, or just about any social entity that can be named” (Kadushin, 2012: 202). So it is hoped that our understanding about acculturation and adaptation could also be expanded by implementing a network analysis. The following sub-sections reviewed literature about the mechanisms that might affect the formation of social networks during acculturation process and the possible impacts of social networks on it.

### **2.3.1. Antecedents of Acculturation Social Networks**

As this study advocates a shift from the current bi-dimensional paradigm to a network perspective, it makes sense to first describe the phenomenon of interest in network terminology, specifically, the network characteristics for this multicultural student community.

Yum (1988) describes the shape of the newly established networks of sojourners or immigrants as radial like a wheel. This corresponds to the type of ego-networks with low clustering coefficients in the terminology of SNA. Yum’s reasoning is that most sojourners and immigrants develop their social ties with alters in very specific and limited contexts (e.g., occupational or educational), so it is less likely that the alters from different contexts would know each other. He also hypothesized that people in an intercultural network (the social networks of the acculturating persons) are connected by fewer relations than one can find in an intra-cultural networks. When two actors are linked together by more than one relation, it is termed as multiplexity (Monge and Contractor, 2003: 31). In other words, Yum posits that multiplexity is more characteristic of an intra-cultural network than of an intercultural one. He explained that some host nationals occupy peripheral roles (such as shoemaker, barber, etc.) in the social networks

of sojourners or immigrants. As they are constrained to their own roles, there is less possibility of them to develop other types of relations with the sojourners or immigrants.

Based on interviews with nine people in the process of acculturation, Smith (1997) describes that their social networks could (1) look like a wheel with a single center, be radial and consist largely of home culture others (which is consistent with Yum's prediction); or (2) have multiple centers, be radial, and consist predominantly of host nationals; or (3) have integrated heterogeneous strong ties. He uses Berry's framework and explains that the three observed types of networks indicate the acculturation modes one chooses. The first type corresponds to a separation approach, the second to assimilation, and the third to integration. He also links them to the outcomes of acculturation that the framework is often used for, and this is discussed further in the next subsection review of this chapter about the impacts of social networks on adaptation. In his later proposed intercultural network theory, Smith (1999) restated this observation that "intercultural networks will be less dense, with more radial ties in cultures reflecting a contextual-based relationship norm than those found in cultures reflecting a personal-based relationship norm" (p. 650).

Another proposition Smith (1999: 647) has in his intercultural network theory about the antecedents for acculturation is that the probability of acculturation increases if socio-structural heterogeneity increases. Vanhoutte and Hooghe (2012) found that when individual level characteristics are controlled, cultural diversity at the community level is an important indicator of the diversity found in the social networks of individuals. A more culturally diverse community offers more opportunities for making intercultural connections and establishing such social relations. However, there is little research on how the presence and promotion of cultural diversity in a community is reflected in or shaping the ways people socialize.

In sum, the review shows that there hasn't been much outlined in the current literature about the characteristics of acculturation social networks. Even when this is done, it is mainly from an ego-network perspective rather than taking into consideration a complete network that offers the most immediate context for acculturation. The descriptions of the networks also lack of precision and are used in a more metaphorical sense regarding visualization layout rather than based in actual structural analysis of the

networks. These issues lead to the breaking down of the first research question into sub-questions that focus on the description of the community level and the cultural group level relational patterns observed in the networks:

**Q1.1: What are the characteristics of the EWC community’ social networks?**

The second and third research questions shift the focus from explaining the structural patterns of social networks to their impacts on cross-cultural adaptation.

**Q1.2: How are people from different cultures relate to each other in this community and what kinds of groups are formed?**

Following the description of the network structure, the question about what accounts for the observed patterns comes naturally. The complete network design allows this study to define the parameters of a multicultural community where acculturation occurs. This is necessary for testing whether cultural similarity and residential proximity affect the social relation patterns within this community. Despite the fact that the formation of social networks is instrumental to successful acculturation, “there is a dearth of studies investigating the antecedents of expatriates’ social networks” (Osman-Gani & Rockstuhl, 2008) and more efforts are needed.

Monge & Contractor (2003) summarized in their book that “Homophily, proximity (physical and electronic), and social support ... have been identified by social scientists as important motivations for why we create, maintain, dissolve, and reconstitute our communication networks” (p. 223). This applies to the social networks established during acculturation as well. “Homophily is the principle that a contact between similar people occurs at a higher rate than among dissimilar people” (McPherson, Smith-Lovin, & Cook, 2001:416). In acculturation network research, the homophily effect is seldom expressed as a hypothesis for testing, but the common practice of categorizing social relations of the acculturating person as co-national ties (vs. host-national ties) allows for connecting the findings to the homophily mechanism.

Bochner, McLeod, and Lin (1977) identified a strong preference for co-national friendship among international students. They also argued that the preference is not only for co-nationals in the strict sense but also for those who came from the same continent or geographic/religious/linguistic area. In a subsequent replication study with a much bigger sample, Bochner, Hutnik, and Furnham (1985) and Alibhai (1985) follows this broader

definition of co-nationals and finds that the overall pattern of foreign students' friendship networks consist of 54% co-nationals, 18% host-nationals, and 28% other-nationals. Wimmer's (2004) study of the immigrants in three communities in Switzerland identifies higher homogeneous ego-networks even in the second generation. The homophily effect is obvious. However, Hendrickson, Rosen, and Aune's (2011) study fails to see such an effect, which is attributed to the inclusion of more weak ties by asking respondents to list all friends (50 maximum) compared to the best-friend nomination in the previous studies. This inconsistency suggests that homophily effect might be more evident in a closer relationship.

However, homophily is a complex construct that can cover a wide range of aspects of similarity. Lazarsfeld & Merton (1954) described two types of homophily: "status homophily, in which similarity is based on informal, formal, or ascribed status, and value homophily, which is based on values, attitudes, and beliefs" (as cited in McPherson, et al., 2001). For example, Vanhoutte & Hooghe's (2012) study found that homophily is less present in weak ties than that in strong ties. In addition, when acculturation studies highlight shared cultural origin, the other shared similarities among those international students can be overlooked. The hidden assumption as discussed in the first chapter of this study is that those involved in acculturation are treated as representatives of their cultural groups regardless of how different a cultural luggage one might carry. More refined and controlled testing of the homophily effect is definitely needed to make strong claims in a multicultural context, which is one of the goals that this study intends to accomplish.

Physical proximity assumes that the probability to meet and interact face to face increases the likelihood of establishing social ties. This factor is seldom studied in acculturation research, but often used as a post-hoc qualifying explanation. Furnham and Alibhai (1985) used a group of students as samples who lived in university residencies, but they did not include proximity in the survey as a factor that influences the formation of friendship networks. Vanhoutte & Hooghe (2012) also suggested that geographical proximity is still an important indicator of friendship ties across cultural groups; however, its impacts are limited in weak tie relationships.

Given the facts that the East-West Center requires all participants (without underage dependent children) to live in one of the two on-campus residential buildings; that the design of the buildings encourages mixing through commons areas such as shared cooking facilities and kitchens, TV rooms, lounges, etc.; and that many events organized by the Center take place in the vicinity, physical proximity becomes a salient factor to be included as explanations of relationship formation.

To obtain social support is another reason for forming social ties. But it differs from the first two factors. Homophily and proximity are both attributes of the individuals and exogenous to the networks. They often rely on the resemblance on appearance and opportunity for contact, so are the basic two mechanisms used to explain the formation of social relations. Social support, although residing in each individual, is enabled through the network connections. In the literature of acculturation research, the cultural origins of the social support is considered a determinant factor by which one would establish relationship. For example, a functional model of foreign students' friendship network (Bochner, et al., 1977; Furnham & Alibhai, 1985) suggests that the primary, mono-cultural network serves mainly the function of rehearsing and expressing the sojourner's ethnic and cultural values. The secondary, bi-cultural network has instrumental function in academic and career development. The third, multi-cultural network is for companionship and recreational activities. This focuses more on what is transmitted through the ties and less on the generic reasons of the structure at a global level. Moreover, studies about social support are often directly linked to the impacts of social networks on adaptation. For example, Farh, Bartol, Shapiro, & Shin (2010) proposed a five-stage model depicting the motivation to seek tie formation, selecting of sources, offering support, utilizing and finalizing the bonding tie. Each of the stages is explained by purposeful attempts made by the expatriates to acquire desired social support for better adjustment.

In sum, social network research has used different indicators of homophily such as race, ethnicity, sex, age, religion, education, occupation, social class, behavior, attitudes, abilities, beliefs, and aspirations. The overall literature is "remarkably consistent across many different relationships and many different dimensions of similarity: Homophily characterizes network systems, and homogeneity characterizes

personal networks” (McPherson, et al., 2001). Therefore, it is reasonable to assume that the multicultural community network will be characterized by homophily as well. But which indicator(s) are the most salient in this context need to be tested. Proximity, as permitted and facilitated by the unique situation of the community studied, is predicted to be another important factor to explain the network structure as well. It will also be interesting to see how these two mechanisms work interactively in the multicultural context as no previous studies about acculturation have put these two factors into test together. Thus, this study addresses a third sub-question:

**Q1.3: To what extent do homophily and proximity account for the formation of social ties in this community?**

To summarize, Table 1 shows how the first research question is divided into two sub-questions corresponding to what has been suggested by the literature as well as the issues that need to be dealt with.

**Table 1. Research Literature Summary on Research Question 1**

RESEARCH QUESTION	SUB-QUESTIONS	BRIEF SUMMARY OF LITERATURE
<b>RQ 1. Defining acculturation as formation of social relations, how did participants acculturate in a multicultural community?</b>	1.1: What are the characteristics of the EWC community’ social networks?	<p><b>Acculturation network characteristics</b></p> <ul style="list-style-type: none"> <li>• Intercultural networks are different from intra-cultural networks in density, shape, and composition.</li> <li>• Different ego network structures are linked to the acculturation strategies used.</li> </ul>
	1.2: How do people from different cultures relate to each other in this community and what kinds of groups are formed?	<p><b>Issues with previous approaches</b></p> <ul style="list-style-type: none"> <li>• Mainly ego-network perspective</li> <li>• Imprecise description of network features without making use of defined SNA measures</li> <li>• More theorizing than empirical testing</li> </ul>
	1.3 To what extent do homophily and proximity account for the formation of social ties in this network?	<p><b>Mechanisms for tie formation</b></p> <ul style="list-style-type: none"> <li>• Similarity in cultural background</li> <li>• Opportunity for frequent contacts</li> <li>• Social support</li> </ul> <p><b>Issues with previous approaches</b></p> <ul style="list-style-type: none"> <li>• Culture as a homophily factor overshadows other shared similarities.</li> <li>• Proximity is seldom studied but used as a post-hoc qualifying explanation.</li> <li>• Homophily and proximity were seldom considered together.</li> </ul>

### **2.3.2. Impacts of Acculturation Social Networks**

The outcomes of acculturation are normally termed as adaptation or adjustment. Studies suggest that there are two empirically independent but related domains for the adaptation construct: sociocultural (behavioral) and psychological (affective) adaptation/adjustment.

Sociocultural adaptation is often measured by the skills acquired by the acculturating person so that he or she can fit in the new cultural community and behave properly. Thus, a social learning framework is useful for explanation. Host-national language proficiency and marital status are often found as important indicators of social adaptation (Dao, Lee, & Chang, 2007; Eustace, 2008). Studies also suggested that friendship with others sharing the same culture and with host nationals are instrumental in the acculturation experience of international students (Al-Sharideh & Goe, 1998; Bang & Montgomery, 2013; Brown, 2009; Hotta & Ting-Toomey, 2013). Physical activities are also found to be conducive for adapting socially as they created a way of connecting with the host nationals (Brunette, Lariviere, Schinke, Xing, & Pickard, 2011).

The psychological domain is better understood under the stress-coping framework developed from clinical practices involving immigrants, refugees, or sojourners. It is often measured by general life satisfaction, depression, homesickness/ feeling out of place, etc. (Pedersen, Neighbors, Larimer, & Lee, 2011; Ward, 1996; Ward & Kennedy, 1993; Ward & Rana-Deuba, 1999).

Specifically for international students, their academic performance is considered a sign of their adaptation, too (Bang & Montgomery, 2013). This aspect is often measured by their language ability, course grades, years of completion, or advisor support (Curtin, Stewart, & Ostrove, 2013; Neri & Ville, 2008; Ramachandran, 2011). The variables that are often used to measure the different domains relevant to the second research question are summarized in Table 2.

**Table 2. Research Literature Summary on Research Question 2**

RESEARCH QUESTION	SUB-QUESTIONS	BRIEF SUMMARY OF VARIABLES
<b>RQ 2. How well did the EWC participants adapt?</b>	2.1 How well did they adapt socio-culturally?	<ul style="list-style-type: none"> <li>• Language proficiency</li> <li>• Marital status</li> <li>• Social difficulty</li> <li>• Friendship</li> <li>• Events and sports</li> </ul>
	2.2 How well did they adapt psychologically?	<ul style="list-style-type: none"> <li>• Life satisfaction</li> <li>• Depression</li> <li>• Homesickness</li> </ul>
	2.3 How well did they adapt in the academic context?	<ul style="list-style-type: none"> <li>• Course grades</li> <li>• Advisor-advisee relation</li> </ul>

Stress-coping and culture-learning are the two major perspectives taken by acculturation researchers in their causal reasoning (Ward, Bochner, & Furnham, 2001). Both consider social support as a crucial factor that affects sociocultural and psychological adjustments. An ego’s social network is often used as an indicator to gauge how much support one can obtain and the type of support is operationalized as determined by the cultural identity of the source (Furnham & Alibhai, 1985; Hayes, 1994; Hendrickson, et al., 2011; Hotta & Ting-Toomey, 2013).

Interactions or contacts with host nationals are theorized as a major source for learning the host language, information about local communities, and culturally appropriate behaviors. A study about Scandinavian students in the U.S. found that social interaction with Americans significantly correlates with satisfaction (Sewell and Davidson, 1961). Richardson (1974) also finds that difference in friendship patterns (with compatriots and host nationals) correlates with satisfaction. The frequency of sojourners’ interaction with host nationals is positively associated with sojourners' general satisfaction (Gudykunst, Wiseman, & Hammer, 1977). In Church’s (1982) review, a common finding from previous acculturation studies is that more host-national friendship correlates with higher level of satisfaction, less homesickness, and less loneliness. Ward and Kennedy (1992) posit that more host-national friends will lead to better adaptation, less social difficulties, and improved communication competence. The most recent study of international students’ social networks by Hendrickson and his colleagues (2011) also finds that those with “a higher ratio of host nationals in their friendship networks reported significantly higher levels of satisfaction, contentment, and significantly lower levels of

homesickness” (p. 10). But Myles & Cheng’s (2003) study finds that some international students are “well adapted to the university life despite the fact that they had not made an intentional effort to contact native English speaking students.” This puts the assumption of host-national relations as necessary for socio-cultural adaptation into question. Hayes (1994) also argued that because “individuals vary widely in their ability to achieve success in various relationships such as family, romance and friendship, individual differences must be considered when attempting to understand why some students are more likely than others to encounter barriers to potential support.

In a similar fashion, interactions or contacts with co-nationals (either in the same host culture or back at home) are considered to offer an emotional buffer during stressful time and benefits psychological adaptation. Bochner et al. (1977) even advocates that “co-national bonds are of vital importance to foreign students, and should therefore not be administratively interfered with, regulated against, obstructed, or sneered at.” On the other hand, it is also considered to hinder sociocultural adaptation by blocking opportunities to interact more with the host nationals. J.K.Kim (1980) argues that there are two effects of local ethnic (i.e., co-national) networks: the retarding effect that slows down the acculturation process and the braking effect that helps maintain stable ethnic identities in acculturation. His study shows that the negative effects of ethnic networks on acculturation at both initial and advanced stages are significant. No positive effects were identified in that study. Anderson and Christie (1982) follow a similar line of argument by stating that the ethnic networks (with co-nationals) can be either assets or liabilities. In terms of access to information, useful contacts, and needed tangible resources, they definitely have positive effects on acculturation. However, a dense ethnic network can exclude their members from other resources available through alternative host-national ties. The visibility of a strong ethnic network also limits the chances for acculturating individuals to mingle with host nationals or other internationals as well. Searle and Ward (1990) argues that the reinforcement of cultural identity makes international students less willing to adapt to the local customs. Maundeni, Malinga, Kgwatalala, and Kasule (2001) posits that co-national friendship can help maintain cultural identity and offer emotional support. However, it can also hinder language acquisition and cause poor adjustment. Y.Y. Kim (2008) theorizes similarly that co-national friendship benefits acculturation in a

short-term and attenuates stress. But having more co-national friends means less intercultural transformation, which will affect one's functional fitness, psychological health, and intercultural identity. Although the positive and negative impacts of co-national ties are well documented in the literature, its conclusions are not all in agreement. Further studies are needed to see how it plays out at a higher level of analysis side by side with host-national ties and other relations.

The general conclusions from the reviewed literature here about the impacts of social networks on acculturation outcomes seem to be (1) ties with host-nationals are found to exert positive impacts on adaptation; and (2) ties with co-nationals, on the other hand, are shown to have both positive and negative effects on adaptation. However, in the SNA literature, the impacts of networks are perceived as being facilitating and constraining at the same time. Thus, the almost unanimous finding that social ties with host-nationals are beneficial seems questionable. Since most of the measures of sociocultural adaptation is based on host culture standards, is it possible to find the constraints of such contacts? This shall motivate future studies to investigate.

One issue with the current research literature on this topic is that local ties with other internationals is not well studied and often left out of the dichotomous host- and co-national contrast discourse. According to Ong and Ward (2005), 74.8% local social relations of international students are with other nationals not with their co-nationals or host-nationals. Sobre-Denton (2011) suggested that a cosmopolitan social support group where connections are "not divided along the line of home and host cultures" can be more beneficial to international students' acculturation. Such dichotomous discussions can fall back easily into the uni-dimensional reasoning that perceives interacting with host-nationals as competing with interacting with co-nationals, for which the four-fold model paradigm criticized as being inappropriate and ethnocentric. A final issue is related to the limitations of the ego-network approach. An ego-network provides less information than a complete network. The size of it is informative as well as the connection patterns, but it is still essentially an individual-centered approach. The network approach's power of assessing outcomes based on the relational structure from a larger context and higher level is not explored.

This study is designed to take advantage of the complete network approach to complement previous efforts. According to Smith's intercultural network theory, "intercultural identity strategies are discernible within social network structures" (1999: 646). In other words, the four modes can be operationalized in a complete network approach based on the actor's culture of origin (attribute-based nominal groups in contrast to structurally identified groups) and put to test. Accordingly, each strategy can be linked to acculturation outcomes as predicted by the theory and supported by previous studies: integration as the optimal mode for adaptation; assimilation is the next, then separation, and finally marginalization. Thus, the sub-question can be stated as: Which network characteristics are related to the individual's sociocultural and psychological adaptation?

Although in-group and out-group social ties are often compared and contrasted in most studies, it has been argued that they should not be conceptualized as mutually exclusive and a more balanced friendship network might result in less acculturative stress and more social support compared to mono-cultural networks (Poyrazli, Kavanaugh, Baker, & Al-Timimi, 2004; Swagler & Ellis, 2003). In fact, an a priori grouping based on attributes of alters in one's social network may not be the optimal way to explain acculturation process and outcomes. Wimmer (2004) argues that although co-national ties are prevalent among ethnic minority groups, their existence may result from everyday pragmatics rather than conscious choice of acculturation strategies. This challenges the practice of interpreting the function of social ties based on the attributes of the actors involved. The assumption that learning about the host culture is mainly from host nationals may not always be true. Learning could come effectively from previously arrived residents, from institutionalized efforts to welcome newcomers to the community, and from the internet. The sources of such information are abundant, so the connections with host-nationals should not be equated to the function of providing information. In addition, host-nationals might not be a good source for acculturation information as they could have a very different reference in mind (such as monetary value, travel means, living conditions, entertainment style, etc.)

Moreover, Ying's (2002) study of Taiwanese students in the United States found that the availability of Chinese students on campus has an impact on the students'

adaptation, which shows a possibility of research artifacts from an attribute-based approach. Vanhoutte & Hooghe's (2012) study found structural constraints of similar kind across levels of analysis. Sobre-Denton's (2011) case study also showed that a multicultural network involving internationals from many other countries can be a more relevant and effective social support system for international students. Thus, a structural view that links individuals with acculturation outcomes might bring in new insights.

It can be inferred that with the increase in the size and density of a network, the more resources may be available from its nodes, and thus the possibility of coping with difficulties for an individual might increase as well. Also, there may be an innate relationship between the network structure, the position one holds, and the outcomes of acculturation. For example, Olaniran's (1993) study shows that the quantity (number of all ties) more than the quality (number of strong ties) of host nationals in an international students' social network is significantly associated with the reduction of their cultural stress and in turn influences their attitudes towards and outcomes of acculturation. T.-C. K. Hsu, Grant, and Huang's (1993) study shows that the degree of acculturation of the alters in an ego network is indicative and predictive of the ego's degree of acculturation. In other words, the better the alters acculturate, the better the ego does or will do. But the acculturation of alters was not measured directly. The ratings were based on the ego's perception of how well the alters adapt. It is hoped that the structural explanations for adaptation can shed light on previous findings, provide alternative measurements for adaptation, and bridge the two paradigms by completing the attribute-only approach.

The third research question and relevant research literature that informed the hypothesis-testing models are summarized in Table 3 below.

**Table 3. Research Literature Summary on Research Question 3**

RESEARCH QUESTION	SUB-QUESTIONS	BRIEF SUMMARY OF LITERATURE
<b>RQ 3. What's the relationship between their acculturation and adaptation</b>	3.1 Acculturation → Socio-cultural Adaptation	Factors affecting socio-cultural adaptation <ul style="list-style-type: none"> <li>• Host-national friendship: +</li> <li>• Size of ego-network</li> <li>• Features of immediate communities (multi vs. mono) matter</li> <li>• Length of stay</li> </ul>
	3.2 Acculturation → Psychological Well-being	Factors affecting psychological well-being <ul style="list-style-type: none"> <li>• Co-national friendship: + and –</li> <li>• Schoolwork pressure</li> </ul>

Finally, it is both interesting and important to learn about the interpretations from the respondents themselves about their social networks, acculturation process, and its outcomes. This would serve two purposes: to validate or qualify the findings from the previous empirical approaches; and to open new ground for future studies. Such goal can be best achieved using an interpretative approach. Fuhse & Mützel (2011) argued that “qualitative methods are important for exploring network structures, and for understanding the meaning connected to them. ... Combinations of these methods prove useful when considering the various aspects of networks (individual connections, structural patterns, and meaning)” (p. 1067).

Smith (1999) proposed that culturally influenced perceptions can shape the function and the experienced nature of social networks. H. K. Kim and McKenry's (1998) study also illustrated cultural variances in perceptions of where to look for social support using sociometric analysis. A study of social interactions and acculturation in a multicultural community cannot assume a unanimous understanding about the phenomenon of interest. The researcher's interpretations should be put into perspective by including the insiders' views. Halualani's (2008) study found that the existence of cultural diversity tends to be interpreted by students of a multicultural university as intercultural interactions. In-depth interviews also reveal that culture becomes less salient in more intimate relationships between close friends. Ingram and Morris' (2007) experiment has an interesting finding that people do not mix at mixers, although they explicitly expressed such intentions. They also found that there are no obvious homophily effects in the mixer parties organized by the research, but people tend to “join and continue engagement with a group as long as it contained at least one other person of the same race as them”. This might suggest that in a multi-racial community there exists a threshold for people to make decisions about mingling with culturally different people or not.

Another aspect that might be enlightening for further studies is the role of information and communication technologies (ICTs) in the process of acculturation. Several studies have shown that ICTs play an instrumental role in sojourners' acculturation in terms of keeping connections with home culture, maintaining ethnic identity, and obtaining local information or support. Kramer (2010: 387) states neatly the

need of researching the acculturating groups and their use of social media when she writes

*“Increasingly, culturally mobile individuals do not abandon contact with their home culture even as they live in another. New technologies such as the Internet and cell phones allow immigrants to stay in close, even daily, contact with their home societies and cultures. They stay abreast of the latest changes in music, television programs, news, and so forth via the Internet. They also can stay in close touch with friends and family back home. Social networks among immigrants today are extensive and vital, transcending cultural and geopolitical boundaries. Immigrants master a repertoire of communication and cultural rules and move between cultures with increasing facility.” (Kramer, 2010: 387)*

The majority of such studies focus on the acculturating groups’ use of ICTs to keep in touch with home. For example, Castro and Gonzalez (2009) found that hometown websites are used by immigrants to strengthen their ethnic identity and stay connected with daily life in their hometown. Jomhari, Gonzalez, and Kurniawan (2008) interviewed young immigrant Malaysian mothers in the U.K. about their use of rich-media types of CMC (e.g., blogs and media-sharing social sites). Their results suggest that these young mothers get many benefits from communicating narratives about raising their babies, communication with families and friends back home, preservation of the life of their babies abroad, and release of stress. Khalid & Dix’s (2010) case study showed that Malaysian expatriate women’s use of photo-logging not only helps them connect with home, but also provides a means for participating in local events in their host culture. A recent study of Chinese students’ acculturation in the U.S. and their use of social media actually concluded that social media are adopted for different uses in the acculturation process and there is no single tool that can serve alone the integration of cultural identity (Zhang, Jiang, & Carroll, 2011).

A quote from So (2011:32) captures the unique functions of social media for the immigrant groups in terms of their connections with home,

*“Social media for migrant workers here in Taiwan and other parts of the world work like a mobile phone charger. They plug in to the net whenever*

*possible and connect with families and friends, check the pictures of their growing children back home that they have missed through years of separation and thus acquire more energy to keep them going. It is an antidote to homesickness, boredom and loneliness.” (So, 2011:32)*

As the ties with home nationals are maintained or sought for more easily with the help of modern ICTs, their role in acculturation should be integrated into previous theories that focus mainly on local co-nationals and host nationals.

In addition, the visibility of social networks and personal profiles on online social networking sites may help sojourners and immigrants to become aware of their available social support from their existing network. It can also trigger implicit judgments about whether or not to friend someone, which may reflect and at the same time affect the selection of acculturation strategies and adjustment outcomes. The public display of social relations at online social networking sites leads to both larger networks and better affordance of more weak ties to be established and maintained (Donath & Boyd, 2004). A simple hypothesis is that whether more friends on the SNSs are correlated with satisfaction towards acculturation as many previous studies shows that the mere size of a social network can be a strong indicator of how sojourners and immigrants feel.

## **2.4. Conclusion**

“Diversity is a fact of life; whether it is the ‘spice of life’ or a significant irritant to people is the fundamental psychological, social, cultural and political issue of our time” (Berry, 2005:711). The overview of acculturation research at the beginning of this chapter demonstrates clearly how academia has been affected by and tried to catch up with such changes in demographics of human society. The prevalent theories and models used in such studies evolved gradually from the uni-dimensional model to a bi-dimensional framework represented primarily by Berry’s four-fold acculturation model. This by far has been the most widely known and applied theoretical framework and guided many studies. Yet, it inherits the dichotomous framing of acculturation issues as well. The neat categorization of acculturation orientations could confine the exploration of acculturation when more than two cultural groups are present. Methodologically, the

bi-dimensional framework has difficulty in matching the receiving society and the acculturating groups' perspectives. Bi-cultural relations are studied extensively but separately. So, it is hard to assess whether adding the discoveries about each pair of cultural groups together provides a complete picture of acculturation in a community where there are more than two ethno-cultural groups. Such issues invite the proposal of SNA as an alternative and complementary paradigm for acculturation research.

The brief review of the history and development of SNA as well as its implications for social and psychological research leads to the effort of combining both approaches to explore the phenomenon of interest. This study is designed accordingly to combine psychometric and structural explanations to address the three classic acculturation questions about how people acculturate, how well they adapt, and what impacts their acculturation exert on adaptation.

Previous literature talks about the shape and composition of social networks of the acculturating people, but most of the descriptions are imprecise (i.e., not mathematically defined network terminology). Studies about the composition and attribute distribution offer limited explanatory power as most of them center on ego-network measures. Thus, the first step is to accurately describe the parameters of the social networks in the community. The second step is to test the mechanisms that can help explain the formation of social ties in such a multicultural community. Literature in network science suggests that homophily and proximity are the two major factors (Monge & Contractor, 2003). Although acculturation research does not use the same terminology as SNA, findings about preferences for co-cultural ties and the effects of availability of co-cultural members on friend-making have similar implications. Thus, these two will be tested and see how much they can account for the existence of social ties.

There are abundant studies in acculturation about social support and its impacts on adaptation. The primary findings are that co-cultural relations are instrumental for psychological well-being and host-cultural relations are conducive to sociocultural adaptation. However, categorizing the functions of ties based on attributes is challenged by findings such as that the quantity of ties matters more than the quality and the diversity of the immediate communities allows for more diverse friendship patterns. Moreover, the dichotomous framing of acculturation issues leads to the neglect of ties

with ethno-cultural groups other than the claimed host cultural group. Thus, the influence of acculturation social networks on adaptation shall be tested in two different ways: attribute-based and structure-based.

Arguments about adding critical and interpretative perspectives to the acculturation literature were reviewed as well. Earlier attempts in this direction reveal that the presence of diversity does not turn into intercultural interactions automatically nor are cultural divisions always salient. Therefore, it is necessary to cross-check findings from different methods. In addition, the fast development of digital media is also worth investigating as they might be appropriated differently for various purposes of acculturation.

As the literature review shows, SNA is beneficial to acculturation studies as it expands the typological frame to a networked focus that resembles more multicultural composition in many hosting societies. As intercultural experiences become more common and communities become more multicultural, it is highly possible that the immediate context in which the acculturating group enters is a hybrid of several cultures inside. Thus, all parties involved could be picking up new identities and behaviors from each other and the static distinction of host and home cultures might not be as important as before. The relational and interactive perspective adopted in this study might provide more insights about the acculturation process and definitely invites more studies.

## **Chapter 3. Method Statement**

This case study explored the acculturation phenomenon in a multicultural student community by modeling the structure of social relations between participants. This chapter starts with an overview of the study design. It then gives a detailed field description about the participants and their life at the Center. How data were collected and processed is explained in the next two sections followed by a brief account of the methods used to analyze the networks and interviews.

### **3.1. Study Design**

The design of this case study was informed by both the existing paradigm of a quadratic framework and the emerging paradigm of social network analysis. On the one hand, the network terminology and structural analysis allow for a description of acculturation experiences in a non-binary discourse. On the other hand, the four types of acculturation modes identified previously serve as references to engage a discussion of the results under the network perspective with relevance to the dominant framework in use now. Moreover, the possibility of multilevel modeling in a complete community network complements previous studies by bringing other relations into the often separately studied bi-cultural groups of the host and one ethnic group.

In order to conduct a full-network analysis, the population (not the sample) of interest needs to be defined. In other words, the decision about how to set the boundary around who are included in or excluded from the full network should be made (Borgatti, et al., 2009; Wellman, 1983). In this study, the official and current membership of the East-West Center (EWC) was set as the criterion for inclusion. For this purpose, the 2012-2013 EWC Participant directory list was used.

Data used to address the three research questions were collected from online surveys and interviews respectively (as illustrated in Figure 11). The first question is about how participants acculturated in this multicultural community. Previous literature suggests that whom one chooses to establish social relations with in the new environment reflects one's acculturation modes or preferences. So here acculturation behavior was

quantitatively operationalized as (1) socialization (casual acquaintance) and (2) developing close friendships with others within this student community. Follow-up interviews investigated interviewees' perceptions of the various cultural groups at the Center and reflections on their acculturation experience.

The second question is about how well those in this community acculturated. Here the outcomes of acculturation were measured in the self-reported survey in three aspects: the difficulty experienced in socio-cultural context, general life satisfaction, and academic performance. Interviewees were also asked about how they felt about living at the EWC and how living in this multicultural setting influenced them.

The last question is about the relation between their acculturation strategies and their adaptation outcomes. This relation was examined both quantitatively and qualitatively. The way that participants acculturate was measured using the community networks constructed on the participants' socialization and friendship relations. The interviewees were also prompted about what they thought as conducive to their adaptation at the Center and what suggestions they would give to others regarding this.

Figure 11 illustrates the study design in relation to the research questions. The next section provides a detailed account of the context and about the participants of this study.

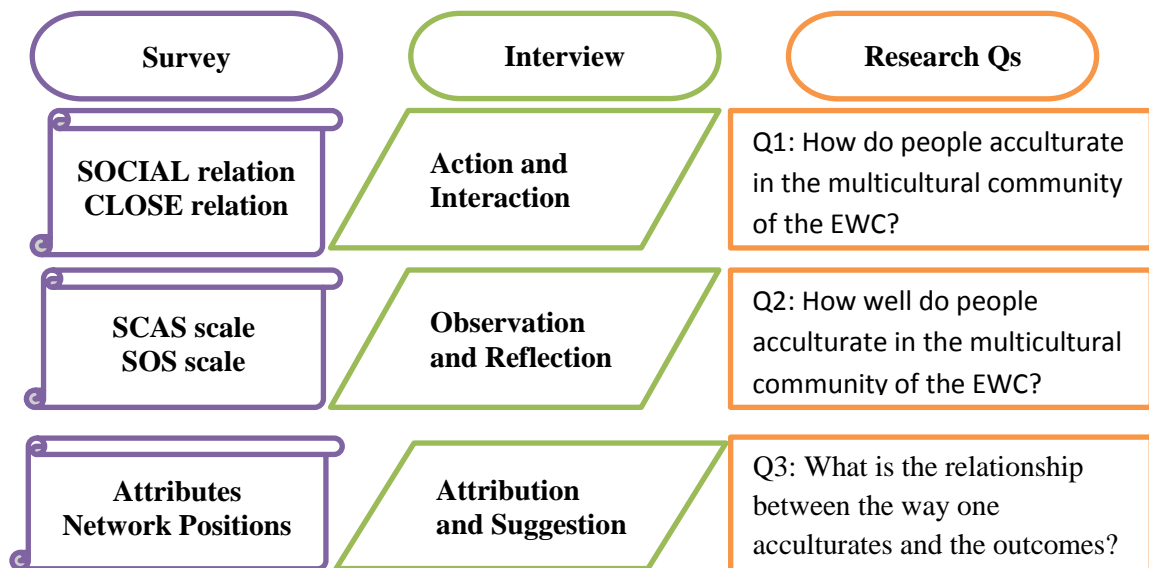


Figure 11. Illustration of Study Design

### 3.2. Participants and Context

The community of interest to this case study is the East-West Center (EWC). It was established by the United States Congress under the Mutual Security Act of 1960 to enhance understanding and collaboration between the U.S. and Asia & Pacific regions in study, training, and research (<http://www.eastwestcenter.org/>). Each year the EWC receives and hosts about 300 students in residence from over 40 countries (mainly from Asia-Pacific regions and the United States). It has gained a world reputation over its 60 years' existence for its multicultural community building. It now boasts a 57,000 alumni network worldwide.

The final report from the *EWC 2020 Participant Vision Project* (EWC Participants, Alumni, Staff, & Friends, 2013) summarized well the Center's success on nurturing positive international relations as,

*“Invaluable networks and relationships have been built and barriers broken down. This is a legacy that includes numerous international leaders whose experiences were positively shaped by their time at the Center” (p. 6).*

All participants sign agreements upon receiving the sponsorship from the EWC to approve the use of their directory information in research. This makes it handy to conduct the full-network analysis. The directory provides the official full names of all current affiliates together with their ID photos. It also contains information about gender, nationality, the EWC program, and the field of study on each participant.

The directory list used in this case study included 280 current participants (excluding the researcher herself and one deceased member) for the academic year of 2012 Fall to 2013 Spring. Each participant was later represented as a node in the full community networks. As is shown in Table 4, the majority of this community came from the Asia-Pacific regions and the U.S.. Given the sheer number of countries covered in each geographical region, it is understandable that, except for some special cases, most countries have only a few representatives in this community. The participants are here pursuing graduate degrees at the University of Hawai'i or attending certificate programs at the EWC.

**Table 4. EWC 2012-2013 Participants by Region and Country**

<b>Code</b>	<b>Region</b>	<b>Countries/Areas</b>	<b>Total</b>	<b>Percentage</b>	
1	EA	East Asia	China Mainland, Taiwan, Hong Kong, Japan, Korea, Mongolia, Russia	75	26.79%
2	SA	South Asia	Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka	27	9.64%
3	SE	South East Asia	Brunei, Burma, Cambodia, Indonesia, Lao, Malaysia, Philippines, Singapore, Thailand, Timor-Lest, Vietnam	85	30.46%
4	PI	Pacific Islands	Australia, American Samoa, Cook Islands, Fiji, New Zealand, PNG, Samoa, Tonga, Tuvalu, Vanuatu, etc.	24	8.57%
5	US	United States	Including Hawai'i	52	18.57%
6	OT	Other	(non-Asia-Pacific or US): Armenia, Brazil, Cameron, Canada, Germany, Italy, Kenya, Netherlands, Nigeria, Serbia, Tanzania, etc.	17	6.07%
		<b>Total</b>	<b>&gt; 40</b>	<b>280</b>	<b>100.00%</b>

At the Center, all participants are required to live in the two dormitory buildings (i.e., Hale Mānoa and Hale Kuahine) except for those that have dependent children with them. There are also other graduate students living in the two buildings, who are not affiliated with the Center. They constitute only a small portion of the total residents and also are culturally diverse. So this residential community has a characteristic multicultural setting with people from over 40 countries.

Another unique feature about the residential participants is that even those who are U.S. citizens (including local Hawaiian residents) are also required to live in the dorm buildings. Thus this community is not just an international student community, but a fair mixture of the host cultural group and all the other cultural groups.

The two residential buildings where the participants live are called Hale Mānoa and Hale Kuahine<sup>1</sup>. Hale Mānoa is a 13-story building with 8 floors of dorms (4 for mixed-gender, 2 for females, and 2 for males) and 5 floors of common space (including the lobby, 2 communal kitchens and 1 water stand on 3 floors, designated lounges for study, TV, social events, instrument play, and laundry, etc.). Hale Kuahine is a 4-story building with 3 floors of dorms (all for mixed-gender) and 1 common floor (including the lobby, 1 communal kitchen area, and rooms for social activities). In both buildings, 10 residents share one unit facility (bathrooms and storage) by 6 single rooms and 2 double rooms. There are 48 units in Hale Mānoa and 12 units in Hale Kuahine, totaling space

<sup>1</sup> Hale in Hawaiian means house, so these are building names.

for 600 people at full capacity. Besides most of the EWC participants, there are other graduate students, EWC alumni, and short-term visitors living in these two buildings.

All participants of the EWC educational programs are required to volunteer for certain hours as community service (within or outside of the EWC community, and ranging from 10 to 45 hours per semester depending on the type of the program). The Center organizes many social and educational events (such as Wednesday Evening Seminar, Community Building Institute, International Graduate Student Conference etc.) for participants, and these are also occasions for volunteering, too. The student's self-elected board for the *East-West Center Participant Association (EWCPA)* also arranges activities such as weekly shopping shuttles and movie nights, annual East West Fest, International Cuisine Day, Concert on the Lawn, etc... In a word, there are plenty of opportunities for participants to get to know and interact with each other during their stay there. Thus, it is feasible to use a complete network approach to map the social relations among members of this community as the community has a salient existence and people are provided with sufficient opportunities to develop social relations with each other.

In sum, the required dorm living and the isolation of Hawai'i from the mainland makes the EWC community a major part of participants' social life. The impacts of these factors on the participants' acculturation experience are discussed in the next chapter's network analysis. As reviewed in Chapter 2, many studies found that one of the crucial elements in the acculturation process of international students is making friends with host-nationals. In many cases, this is difficult because of varied foreign language proficiency, separate housing and student organizations. But at the Center, such difficulties were alleviated to a great extent, and such a unique socio-cultural context makes the case study approach and the full network perspective more meaningful.

### **3.3. Data Collection**

As illustrated in Figure 11, this study collected data mainly in two ways: an online survey and interviews. It used archival data from the EWC 2012 Fall – 2013 Spring directory, which includes all participants' name, photo ID, gender, EWC scholarship program, nationality, and major at the University of Hawai'i or Pacific University. The

following sections give a detailed account of the procedure and instruments that were used for data collection.

### **3.3.1. Pilot Study**

A pilot study was conducted to test the online survey (which is not exactly the same as Appendix A as several changes have been made according to the feedback). 17 out of 29 participants of the Asia Pacific Leadership Program at the East-West Center responded to it. This group is part of the targeted population but differs in three ways: (1) it is a short-term certificate program of 5 month rather than a long-term degree program; (2) its participants attend together the same courses organized by the program rather than spread across departments at the University of Hawai‘i at Mānoa (UHM); (3) they need to complete a 3-week field trip in small groups during which relationship among members tends to develop at a faster pace than those enrolled in degree programs at UHM who meet less frequently. These differences are expected to influence the characteristics of the social networks and distinguish this group from others. Thus the features of the network from the pilot study might not be informative to the whole study. Yet, despite that, issues pertaining to the implementation of the survey, such as online display, response time, and comprehension were valuable feedback for revising the survey before opening it to the whole community. This is especially true for complete network survey as the burden on respondents can be daunting and directly affect the quality of the data.

The response time for the testing survey according to the log record was between 13 to 25 minutes (with one lasting over an hour). In this version, the first network question asked was “Who do you KNOW?” (defined as facial recognition and brief exchanges of words or interactions). It was hoped that answers to this question would help the researcher gauge how big the general social network of a respondent can be within the community. Results show that the mean number of people each respondent knows is 82 (ranging from 34 to 124). However, feedback from respondents suggests that this relationship is too general to convey any meaning or have any influence on them. It also involves a lot of clicking on the images, which is fun but tiresome at the same time. When respondents finally get to the second and third questions about their SOCIALIZE

and TRUST (original wording, but changed to CLOSE later, see below for explanation) networks, the ability to recall names is still an issue reported although it has been facilitated by the prompt of the images and the auto-complete list. With what was said, this question was dropped in the final version to ease the response burden, shortening the time of completing the survey, and allowing for more accurate data input for the major questions about socialization.

On average, respondents report that they socialize with 7 people (ranging from 1 to 12). One response says “all APLP fellows”. This is probably unique to this group: as stated before it is a very intense program and all 29 fellows spend a lot of time together each day for courses or field work. For the third network question, respondents nominated 4 to 5 people whom they trust (ranging from 1 to 9), which is not surprising as this represents a strong tie and for a short-term program, such strong relations may not have been developed much yet.

Comments made by respondents suggest that the question on trust was problematic, even though a brief definition was provided in brackets accompanying the question. Trust is considered too value laden and results in reluctance or hesitance to respond. So in the current version, the definition is kept (feel comfortable to share personal thoughts and feelings), but the question is worded as “Name up to 6 friends by closeness to you”.

Recall that social media are identified in previous literature as instrumental to acculturation, so the survey listed different types of media for the respondents to choose from as communication channels with people at home or in Hawaii. But the replies from the pilot study did not differentiate much. Fifteen out of the 17 respondents checked all types of media. Since the answers did not offer much information, most of these questions were dropped to shorten the response time further. Only one open-ended question was added with an aim to capture social media use in case there is a difference in the actual population.

The feedback from respondents and issues encountered in the pilot study were taken into consideration in revising the final released version of the survey.

### 3.3.2. Online Survey

The officially released online version of the survey (see Appendix A) consists of three parts: the demographics, the social network questions, and the acculturation scales (Table 5). Besides the basic information obtained from the directory, additional questions asked including the time they have been in Hawai‘i, dormitory of residence, languages they speak, relationship status, religious beliefs, social media use, and social connections outside of the EWC community. Such information was collected as nodal attributes to provide more context for understanding the basic mechanisms behind the formation of the networks in question.

**Table 5. Demographic Survey Items**

<b>Demographic Survey Items</b>	<b>Rationale for Inclusion</b>
Ethnicity, religion, language, identity	Homophily indicators
Dorm location (building, floor, kitchen)	Proximity indicator
Relationship status, parental status, time in Hawai‘i	Controlling factors
Social media use	Informing follow-up interviews

The second part of the survey collects relational data within this community. In order to map the respondents later to their corresponding nodes in the final social network, they were asked to provide their real names, but were informed twice (at the beginning and before the network questions) that confidentiality would be carefully protected following proper procedures. No one except the researcher has access to the lookup table for such information; thus the results cannot be pinned back to the individuals. An exempt approval from the Institutional Review Board at the University of Hawai‘i was obtained.

Two questions about social relations in the EWC community are stated in the questionnaire as: (1) Please **CLICK ON ALL** whom you have **SOCIALIZED** with (i.e., on occasions you have just selected) **HERE** in Hawai‘i, and (2) Please **NAME** up to 6 friends (from those you just selected) by **CLOSENESS** to you (from the most to the least). Capitalization and colored keywords were used for emphasis and definition of the type of relations in question was provided in notes. Later in the analysis, two social networks were constructed based on name selections from the 280 participants for the first question

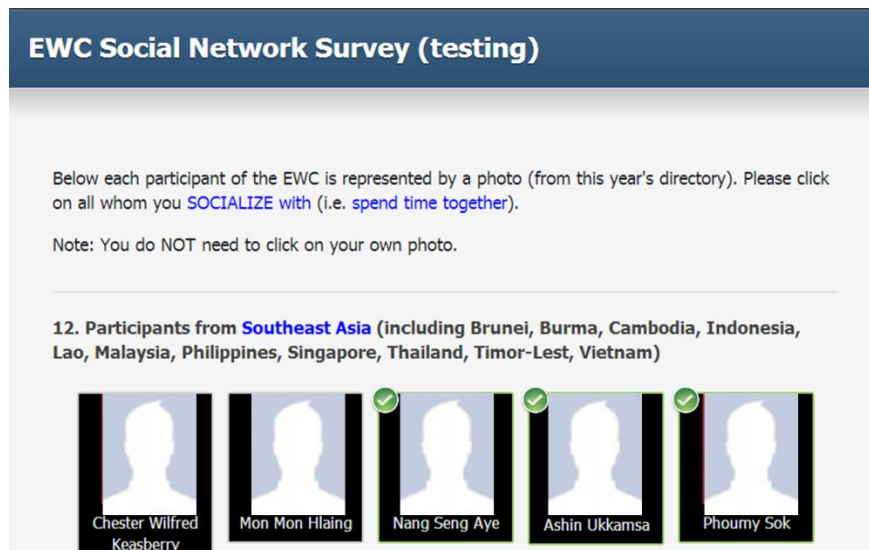
and the six name nominations in the second question. These names were later matched to the numbered directory name roster and replaced by the ID numbers.

Investigators report that the most accurate social network generation technique is from recognition based on a list of members with respect to unaided recall or direct estimation of the network size (Hlebec, 1993; Sudman, 1985). Moreover, it is relatively more difficult to remember and spell correctly a foreign name, so the EWC ID images with names as captions were used as prompts for the first question on socializing relational question to ease the respondents' burden. Socializing here is defined as often spending time and doing things together. A multiple choice question on socializing occasions was asked before the name nomination question in order to get a sense of what contexts the respondents have in mind for the defined social relations.

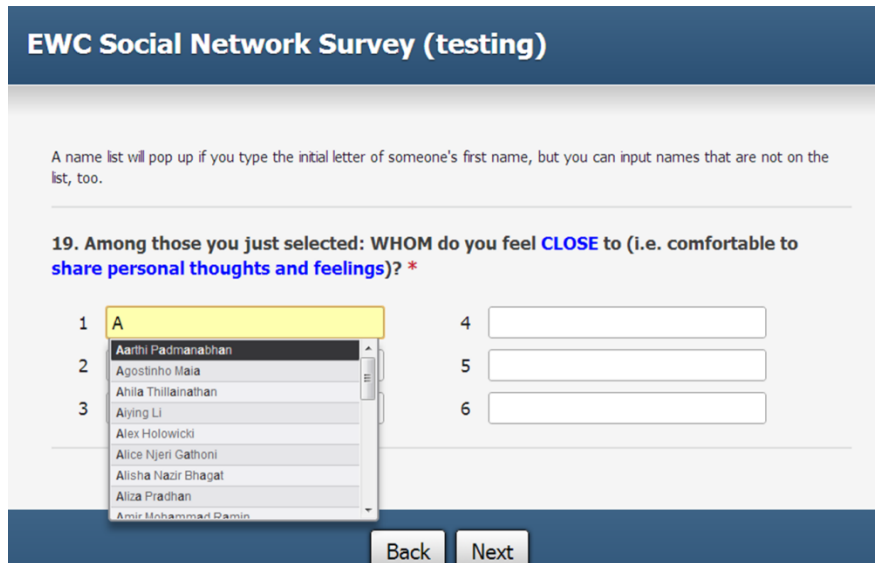
Three participants did not have ID photos, thus blank images captioned by their names were used as position holders. The remaining 277 pictures were broken down to regions according to the customized categorizations in the EWC annual fiscal reports (e.g., East Asia, Pacific Islands, see Table 4). For each region, respondents were instructed to click on the pictures of those they socialize with. The pictures within each region were arranged by nation as the first order and first name as the second order. Such an arrangement is to facilitate efficient name recognition. Feedback from initial testing of the survey suggested that it took longer for respondents to look for people they know if the pictures were arranged in alphabetical order. At the end of the name and picture list of all participants, an additional question was asked to allow respondents to input names of those they did not see pictures of in case that they missed a few amidst the 280 pictures or some nominations were for those who were not affiliated to the Center currently as defined in this study. This allowed for the maximum nominations of 286 names (280 within the community plus 6 outsiders). Such a relatively non-constraining approach for network size is recommended as the most successful and appropriate for the optimal results it often produces (Marsden, 1990). Although there is an upper bound for this survey, the sheer number on the name roster is a proxy of a non-constraining name-generating technique as studies have suggested that the average size of an ordinary American's social network is about 250 (Killworth, Johnsen, Bernard, Shelley, & McCarty, 1990).

Images were used because it is the least mentally taxing and is a great help for name recognition in this question and recall for the subsequent question. The nominations were considered as directional (e.g., A socializes with B, but B does not socialize with A) and binary (e.g., one either does or does not socialize with one another). The second question required nominations and ranking of up-to-six friends with whom the respondents feel the closest to. An auto-complete list of all 280 participants by the alphabetic order of first name was offered, but it was also noted that respondents could nominate others outside of the EWC community. This provided a more accurate picture of how many close friends one had within the community rather than forcing reluctant choices when such friends were not in the studied population.

To illustrate how these options appeared to the respondents, two screenshots (Figure 12 and Figure 13) are included here.



**Figure 12. Online Survey Screenshot 1: SOCIALIZING relation**



**Figure 13. Online Survey Screenshot 2: CLOSE relation**

The final part of the questionnaire consisted of two scales: Sociocultural Adaptation Scale (SCAS, Ward & Kennedy, 1999) and the Schwartz Outcome Scale (SOS–10, Blais et al., 1999). They were used to capture the behavioral and affective domains of acculturation outcomes. As reviewed in Chapter 2, previous studies suggested that they are conceptually and empirically distinct domains of adaptation (Searle & Ward, 1990; Ward, 1996; Ward & Kennedy, 1993, 1994), so it was worth measuring both.

Respondents to the SCAS were asked to indicate how much difficulty they find in certain situations in a specified hosting culture (i.e., Hawaii in this case) on a Likert scale of 5 (1 = no difficulty; 3= moderate difficulty; 5= extreme difficulty). It is a flexible scale that can be modified and used for different populations. The scale’s cross-cultural validity was well documented (Ward & Kennedy, 1999). This study chose 17 out of its 41 statement pool, which include the most common ones across studies using this scale (No.1 to 10) and those (No. 17, 24, 25, 30-33) that pertain to the specific context and population of this study (i.e., university students). The reliability test of the most common items (No. 1 to 10) is reported to have scalar alphas ranging between .75 to .91 across diverse sojourner samples (Ward & Kennedy, 1999). Examples of the social contexts and behaviors asked about in this scale are: making friends, going shopping, and understanding local words and expressions, etc.

The SOS-10 was originally developed as a short scale (10 items) to measure the effectiveness of mental health treatment (Blais, et al., 1999). Young and his colleagues (Young, Wawehler, Laux, McDaniel, & Hilsenroth, 2003) used four different samples of college students in a study to illustrate the SOS-10's robustness and validity in various settings with normal population as an outcome measurement of psychological well-being. In both Blais, et al.'s (1999) and Young, et al.'s (2003) studies, the scale was reported to have satisfactory convergent validity (all  $r \geq .67$ ) and divergent validity (all  $r \leq -.66$ ) with other scales on mental health. High test-retest reliability was reported as well ( $r = .87$ , Chronbach's  $\alpha = .96$ ;  $r = .86$ , Chronbach's  $\alpha = .90$ ). The respondents were asked to indicate how they have generally been feeling in the past seven days on a 7-point Likert scale (0=never and 6=all the time or nearly all the time). Statements are about whether one feels hopeful or satisfied with their current life conditions and whether they feel confident or have the ability to sustain relations and handle things. The survey was built on the platform of SurveyGizmo (<http://www.surveygizmo.com/>) and was kept open for two months from March 3rd to May 7th, 2013. The link to the survey was sent out to the community's listserv<sup>2</sup> three times as well as embedded in personal correspondence via email and Facebook page. It was also advocated at various EWC events. All together 182<sup>3</sup> people completed the survey. Among them, 150 are on the directory name roster (i.e., members within the defined network boundary) and this gave the study a response rate of the targeted population at 54% roughly.

### **3.3.3. Follow-up Interview**

Follow up interviews were conducted to collect more qualitative information to contextualize the empirical results and to bring the respondents' perspectives into the interpretation of the data. The primary goal is to understand how acculturation was experienced and interpreted by the members of this multicultural community as well as

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<sup>2</sup> This listserv is open to all participants for making announcements, but it is a self-opted in/out email subscription, so it does not guarantee to reach all current participants. Actually, many alumni are still on the list as well as no-longer-used email addresses.

<sup>3</sup> Actually, 185 responses were collected, but 3 of them were identified as having been filled out by the same persons at the final call for participation and were taken out during data cleaning.

the outcomes of it in their own words. The interview protocol was submitted to and approved by the IRB office after the survey was completed.

Interviewees were selected in order to cover a wide range of participants in terms of their personal attributes. All together twenty seven interviews were conducted from mid-June to September. 17 of the interviewees are females and 10 are males. Their ages range from 24 to 57. They are from five different EWC programs (both short and long term) and major in 20 different fields. 13 of them are single and among the rest, half are maintaining a long-distance relationship and half have their partners living with them during the study time. The interviewees came from all the six cultural regions (see

Table 6). All floors in the two residential buildings were also represented. The detailed information for each interviewee was not provided here for confidentiality reason.

**Table 6. Interviewees by Region, Gender and Dormitory**

Region	Gender		Residency			Sum
	Male	Female	Hale Mānoa	Hale Kuahine	Off-Campus	
<b>East Asia</b>	1	4	4	1	0	5
<b>South East Asia</b>	1	4	4	1	0	5
<b>South Asia</b>	3	2	4	0	1	5
<b>Pacific</b>	0	3	1	1	1	3
<b>US</b>	3	3	5	1	0	6
<b>Other</b>	2	1	2	1	0	3
<b>Sum</b>	10	17	20	5	2	<b>27</b>

The interview was semi-structured and the protocol was revised three times as the interviews went (see Appendix B for the final version). They were conducted mainly on the site nearby the residential buildings. Three were done through Skype because the interviewees or the researcher were on field trips. Each interview took approximately 45 to 60 minutes and they were all recorded with the informed consent from the interviewees. The longest one lasted over two and a half hours. Most interviews were conducted in English and only two were in Chinese as per the preference of the interviewees.

The interviewees were asked about their life path before joining the EWC, especially their previous intercultural experience. They were then asked to reflect on their social life and adaptation to this community and how living with people from other

cultures might have changed them. The interviewees were also prompted about their perceptions of other cultural groups in this community. At the end of the interviews, the interviewees' personal socializing and close friend networks were shared with them (anonymized but with information of nationality and cultural region). This was especially appreciated by the interviewees, and the implications of this are discussed in the final chapter.

### **3.4. Data Processing**

One hundred and eighty two complete questionnaires were exported from the SurveyGizmo platform in Excel format at the end of the survey phase. The names of respondents were cross-checked with those listed on the directory. Whether the listed participant responded to the survey or not was coded as a binary variable (“response status”) as a personal attribute. Some survey respondents who were not in the directory were given temporary and unique ID numbers and marked out in another binary variable (“EWC status”) to signify their non-affiliation with the Center.

Answers to the first part (demographics) and the last part (scales) of the survey were coded into attribute variables that were used in further analysis. Replies to the two relational questions on “socializing” and “feeling close to” were cleaned, standardized, and matched to the directory list and populated the networks used for data analysis. The following sections explain the procedures in detail.

All interview recordings were transcribed partially (covering major contents and themes, but not word by word). The identities of the interviewees were cross-referenced with their survey responses and directory information and then anonymized. They were given unique interview ID numbers as well for record keeping.

#### **3.4.1. Network Construction**

To construct a full network, one needs at least a node/actor list and an edge/tie list (based on a certain relation). Nodes/actors represent the participants and edges/ties represent the relations connecting them. Node attributes and edge weight are additional information that can be added later for more refined analysis. In this case, each

participant on the directory list was given an ID number and it served as the node list for both the SOCIAL and CLOSE networks.

Choices made by clicking on the photos of other people provide the initial edge list for the SOCIAL network. Then nominations of those who were not on the list (or were not seen by the respondents due to various reasons) were checked and added to the list. Answers to “who do you feel the closest to” provided a ranked list of names of participants that are connected to the survey respondents by close friendship ties. They were cross-checked with the directory as well as with the list of “other name(s) one goes by in this community” obtained from the survey. As the network boundary was drawn according to the directory, names that were not on the list could not be added as a new node, so were left out in this study. This design is to ensure that respondents did not feel forced to pick their closest friends only from those in the community.

Four respondents commented that they did not want to rank their friends because all of the friends in their minds rank the same. Therefore they gave no responses. All the other respondents have nominations ranging from 1 to 6 ranked by closeness. The nominations were used as the edge list for the CLOSE network and the ranking was transformed into edge weight from 6 to 1 correspondingly.

Among the 182 people who responded to the survey, 150 were on the directory list, which means that their pictures and names were available on the survey. The remaining 32 were all residents in the two EWC dorm buildings, but not currently affiliated with the EWC. Because their photos were not on the directory list, they lacked substantial and consistent nominations of them from most respondents. Fourteen of them received no nomination at all. Besides, their individual attributes, such as gender, nationality, study programs, could not be obtained from the EWC directory, so it was decided to exclude them from the full-network analysis. But, their responses to the two adaptation scales were used for assessing the psychometric properties of the measures and the estimation of the socio-cultural adaptation and life satisfaction indicators for all (explained in more detail in the next section).

After names were cross-matched, corresponding personal information (e.g., gender, program, major, relationship, dorm, etc.) of all nodes were saved as an attribute matrix as input data files for the network analysis software UCINET (Borgatti, Everett, &

Freeman, 2002). Two initial adjacency matrixes were generated based on the (1) SOCIALizing and (2) CLOSE friend relations. The SOCIAL network is directional and binary. The CLOSE network is unidirectional and weighted.

Table 7 below shows the breakdown by regions of the survey respondents in comparison to the total number of participants on the EWC directory. It can be seen that the survey covers a representative portion from almost each region (all are over 45%) and the overall response rate is 53.57%.

**Table 7. Survey Response Summary by Region**

Code	Region	Survey Respondents	Directory Participants	%Coverage
1	East Asia	37	75	49.33%
2	South Asia	19	27	70.37%
3	Southeast Asia	42	85	49.41%
4	Pacific Islands	11	24	45.83%
5	United States	29	52	55.77%
6	Other	12	17	70.59%
	<b>TOTAL</b>	<b>150</b>	<b>280</b>	<b>53.57%</b>

Note: Specific countries in each region are listed in Table 4.

### 3.4.2. Non-Respondents and Missing Data

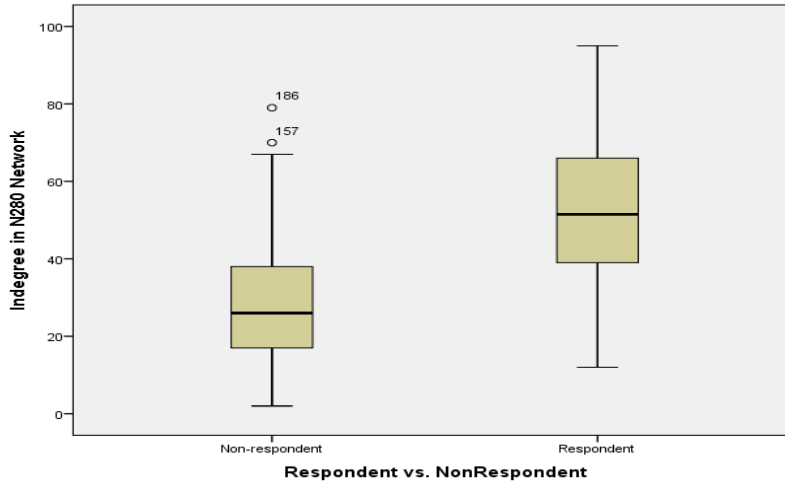
According to Stork and Richards (1992), it is necessary to compare respondents and non-respondents on their personal attributes to see whether there is systematic difference between them before deciding on the method of treating the missing values. Therefore, Pearson Chi-square tests were run to check and compare the counts of two demographical variables (SEX and REGION) with regard to the respondent status (responded or not to the survey). The results suggest that the two groups have a similar mixture of people (SEX,  $\chi^2=.684$ ,  $df=1$ ,  $p=.408$ ; REGION,  $\chi^2=6.854$ ,  $df=5$ ,  $p=.232$ ). In other words, the respondents and non-respondents did not differ significantly in terms of demographical variables such as sex and region (See Figure 14).

The previous results suggest that there is no systematical missing of data due to the characteristics of respondents (i.e., gender or cultural regions). Then the difference in network positions between respondents and non-respondents was checked. It was found that in the ranking list of the in-degree centrality (i.e., top nominated by survey

respondents, representing social popularity) of all in the full SOCIAL community network, there are

- 9 non-respondents ranked between 1-100, and
- 50 non-respondents ranked between 101-200

This result is understandable as those who are active in the community have more opportunities to be informed of the survey. They might also be more willing to respond to it as some felt proud of being highly sociable persons. The researcher tried to explain more in person and spread the word about this misunderstanding, but it is hard to estimate the negative impact of such thoughts. In addition, the very nature of those who were not closely connected to the community were more likely left out of the study as it was the community's social network that enabled the distribution of the questionnaire. An independent t-test was run to see whether the number of received nominations (aka in-degree) of respondents differ considerably from those of non-respondents. The in-degree distribution is approximately a normal one with a slightly positive skew of .418 and its kurtosis is -.442. The t-test result is statistically significant ( $t=12.3$ ,  $p < .001$ ) and suggests that respondents receive more nominations (higher in-degree) in general than non-respondents (see Figure 14).



**Group Statistics**

	Respondent vs. NonRespondent	N	Mean	Std. Deviation	Std. Error Mean
Indegree in N280 Network	Respondent	150	53.47	19.254	1.572
	Non-respondent	130	28.22	15.051	1.320

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Indegree in N280 Network	Equal variances assumed	10.663	.001	12.089	278	.000	25.250	2.089	21.139	29.362
	Equal variances not assumed			12.300	275.178	.000	25.250	2.053	21.209	29.292

**Figure 14. Comparison of Individual Attributes and Network Properties between Survey Respondents and Non-Respondents**

Thus, the caveat for understanding the results from this study is that the analysis of these networks provides a more reliable account of the core people rather than the peripheral ones in this community.

Moreover, note that there are 29 participants who were affiliated through an EWC certificate program (Asian Pacific Leadership Program) and lived locally for five months in the dorms. Most of them had left prior to the starting date of the survey, although they were actually the group that participated in the pilot study. As there was a major change made to the questionnaire, their responses could not be re-used together with the main study. There are another 32 who graduated from their respective EWC programs in 2013 Spring and some of them also have left for good. These two groups have the highest non-response rate: about ~75% (i.e., 15 out of the total 61 of them replied to the survey) mainly due to the end of their programs.

Although several means were taken to boost the response rate, there were still 130 EWC participants who did not reply to the survey, which means 46% missing data from non-respondents. Since whole-network analysis is concerned about the overall structure, a decision has to be made about ways of dealing with the non-respondents before any meaningful analysis could be done. Since respondents and non-respondents differed considerably in their socialization popularity, a proper way of treating the missing values should be selected. The imputation approach based on probability was selected for this purpose and is explained below.

Znidarsic, Ferligoj, & Doreian (2012) developed a framework to address network missing data (see Table 8). This framework was applied to the current study and is illustrated below. Note that  $n$  represents the total number of nodes in the full network (or the complete list of participants at the EWC) and  $m$  represents the non-respondents. The upper-left cell refers to ties between respondents only (i.e., no missing values), and the ties from respondents to non-respondents are not used, which are represented in the upper-right cell. The ties from non-respondents to respondents are unknown (i.e., lower left cell), but can be estimated as the ties from respondents to non-respondents are known. The lower right cell represents the missing ties between non-respondents, which is hard to estimate.

**Table 8. Missing Data Patterns in Full-Network Construction**

	<b>Respondents (n-m)</b>	<b>Non-Respondents (m)</b>
<b>n-m</b>	Fully Observable/ Measureable Ties <b>(n-m)(n-m-1)</b>	Ties between respondents and non-respondents <b>(n-m)m</b>
<b>m</b>	Possible Missing Ties between respondents and non-respondents ① <b>m(n-m)</b>	Possible Missing Ties between non-respondents ② <b>m(m-1)</b>
All Possible Missing Ties= ①+② <b>m(n-1)</b>		

Huisman's (2009) analysis shows that using random reconstruction to impute non-random missing data (degree-related, as in this study) does not correct the effects of non-response and could result in more biases on network properties in a directed network, such as reciprocity, transitivity, and assortativity (Huisman, 2009: 25). Therefore, he suggests ignoring the missing data and qualifying the descriptive statistics for the full-

network. The reason is that random reconstruction tends to interfere with the network's structure if both ties are missing in a dyad due to non-response.

However, in order to provide a full range of possible indexes of the networks in this study, the complete-case networks, networks with missing values and the networks with missing values estimated were constructed. In each analysis reported in Chapter 4, the networks least affected by the missing values in question were used.

Table 9 lays out the three types of networks with regard to their respective ways of incorporating the missing values. The complete-case network was the smallest in size because it only included responded participants from the community. In this case, it is a 150 by 150 network. The full-network with missing values has all listed participants regardless of their survey response status. Therefore, it utilized all information offered by the respondents. The cleaned version of the full-network implemented the imputation method to treat the missing values. Specifically, the missing ties due to non-response were replaced with values reported by the 150 respondents. In other words, the missing rows are replaced by their corresponding columns in their transpose matrix thus assuming that those who do not respond will reciprocate nominations by respondents. Although this is not an ideal way of dealing with the missing values, it is better than treating the missing values as absent ties in certain analysis. Or in other words, “[t]his may not be exactly right, but it will be more accurate than treating the missing values as zeros. (P.76)” (Borgatti, Everett, & Johnson, 2013:73-6).

Table 9. Full Networks Constructed for Data Analysis

AVAILABLE DATA		MISSING DATA	
Respondents → Respondents (150 → 150)	Respondents → Non-Respondents (150 → 130)	Non-Respondents → Respondents (130 → 150)	Non-Respondents → Non-Respondents (130 → 130)
<b>Complete-Case Network</b> (N150S & N150C)* <i>Note: no missing data</i>			
<b>Full Network with Missing Values</b> (N280S & N280C)* <i>Note: all available data from the survey</i>			
<b>Cleaned Full Network</b> (CL-N280S & CL-N280C)* <i>Note: missing values replaced by corresponding columns</i>			
<b>Ideal Full Network with No Missing Values</b> <i>Note: 100% response rate is needed for constructing this network.</i>			

\*S=Socialization relation; C=Close friendship

To make it clearer for future reference in the data analysis chapter, the labels for matrixes of the networks and their attributes are listed below in Table 10:

Table 10. Matrices Used in Data Analysis

TYPE	SOCIAL network	CLOSE network**	Attributes
<b>Complete-Case Network</b>	N150S	N150C	N150_Attr
<b>Full Network with Missing Values</b>	N280S	N280C	N280_Attr
<b>Cleaned Full Network*</b>	CL-N280S	CL-N280C	N280_Attr

\* Constructed using imputation methods to symmetrize ties between respondents and non-respondents.

\*\* These networks are dichotomized at 0 and treated as undirected.

### 3.4.3. Network Notation and Metrics

The conventional notations of the symbols and definitions of relevant constructs used in network analysis are provided in Table 11 for the convenience of reference.

A network can be represented by either a matrix or a graph, both of which are used in the presentation of results in the next chapter. Following the convention, the number of nodes or actors in a network is represented by  $n$  and the number of ties or edges is  $m$  in the formula. Other symbols were explained later with regard to the measures used.

#### **Centralization**

Centralization is an indicator of the overall distribution of nodal centrality measures across the network in question. It is calculated based on an individual node's centrality scores, so nodal centrality needs to be defined first. There are different centrality measures (e.g., degree, betweenness, closeness, eigenvector, etc.) that represent different aspects of a node's impact on or importance to the network. The most common one is degree centrality, which indicates how many other nodes a node is connected to.

A degree centralized network has a small number of nodes that have high degree scores while the rest have very low scores. The extreme case is a star-structure, in which one node is connected to all and the rest are connected only to the center one. Studies show that a more centralized network is often beneficial for management efficiency.

#### **Clustering Coefficient**

This indicator can be calculated in two ways to capture the global and local network structure. The global one measures the transitivity of a network, or in other words to what extent a friend's friend is a friend. It can be calculated at the individual (ego) or network level. It indicates how many triadic relations are actualized with respect to how many are possible.

At the individual level, this is often used to suggest a person's prestige in his/her ego-network. For a full-network, a large coefficient might suggest a clumpy structure where there are some parts denser than other parts. However, this measure is not ideal and should be used in combination with other measures in perspective.

## **Density**

Density indicates how many ties are established given that all social ties within a community are possible. It provides a crude measure for the cohesion of the network and usually makes no sense in comparison across networks because the number of possible ties increases quadratically when the size of the network increases. Moreover, when the network size is very large, the implicit assumption that every node can and will interact with all the others is questionable. It might not be realistic in a real-life situation to expect that a person would make as many connections as the size of the community allows and this should be borne in mind in interpreting this network measure (Bandyopadhyay, Rao, & Sinha, 2011: 9-10) In practice, network density is often used together with the average degree as indicators of the network cohesion (i.e., how closely the nodes are tied up in the network).

## **Modularity**

Modularity is a measure of the extent of structural clustering in a network. It compares the number of internal ties with that of external ties in a given partition with those expected at random, so the higher it is, the better the clustering is. It can be implemented as an optimizing algorithm to find the partition that yields the highest score as the best partition. It can also be used to quantify different ways of partitioning the same network for the purpose of comparison. The interpretation of the structurally defined clusters is relative to attributes available for the nodes in the network and other contextual factors.

## **Reciprocity**

Reciprocity refers to the extent that a directed relation is mutually acknowledged or reciprocated and this is one of the fundamental mechanisms for interpersonal relationship development. The rates of reciprocity often differ by the measured relations. For example, people tend to reciprocate friendship but not mentorship; nations might reciprocate diplomatic relations but not necessarily export or import relations. This measure can also be used for probability estimates of the unreported relations from non-respondents in network study.

Table 11. Basic Network Measures

Measure	Definition/Explanation	Formula	Note
<b>Centralization</b> (Hanneman & Riddle, 2005; Wasserman & Faust, 1994:176-7)	Freeman graph centralization measures the degree of inequality or variance in a network as a percentage of that of a perfect star network of the same size. In the star network, all the actors but one have degree of one, and the "star" has degree of the number of actors, less one.	$Cen = \frac{\sum_{i=1}^N [C(n_{max}) - C(n_i)]}{\max \sum_{i=1}^N [C(n_{max}) - C(n_i)]}$	Range [0, 1] The numerator is the sum of the differences between the largest nodal centrality and the observed values. The denominator is the theoretical maximum possible sum of differences in nodal centrality (i.e., a star network).
<b>Clustering Coefficient</b> (Borgatti, Everett, & Johnson, 2013: 156, 260; Hanneman & Riddle, 2005; Watts & Strogatz, 1998)	1. <b>Local:</b> The average of the density of all the open neighborhoods of all nodes. 2. <b>Global:</b> The proportion of transitive triads (i.e., where there are ties from $i \rightarrow j$ and $j \rightarrow k$ , there is also a tie from $i \rightarrow k$ ) across all possible triads.	1. $\bar{C} = \frac{1}{n} \sum_{i=1}^n C_i$ 2. $T = \frac{\sum_{i,j,k} x_{ij} x_{jk} x_{ik}}{\sum_{i,j,k} x_{ij} x_{jk}}$ ( $i \neq j \neq k$ )	Range [0, 1] This measure characterizes the clustering or lumpiness in a network. The local measure is also known as <i>Watts-Strogatz clustering coefficient</i> , and the global measure as <i>transitivity</i> .
<b>Density</b> (Borgatti, Everett, & Johnson, 2013: 151-2; Wasserman & Faust, 1994: 101-2)	The density of a network is the proportion of possible ties that are actually present in the graph. It is the ratio of the number of lines presents, L, to the maximum possible.	$\Delta = \frac{L}{N(N-1)/2}$ (undirected) $\Delta = \frac{L}{N(N-1)}$ (directed)	Range [0, 1] This measure cannot be compared if the sizes of networks differ.
<b>Modularity</b> (Newman, 2006; 2010:223; Newman & Girvan, 2004) <b>*Assortativity</b> (Newman, 2010:229)	Modularity compares the number of internal links within the groups to ties between groups. <b>*Assortativity</b> is normalized modularity.	$Q = \frac{1}{2m} \sum_{ij} (A_{ij} - \frac{k_i k_j}{2m}) \delta(c_i, c_j)$	Normalized Range [1, -1] This measure assesses how good a partition is structurally. A positive value means there are more ties within clusters than would be expected if ties are randomly distributed.
<b>Reciprocity</b> (Borgatti, Everett, & Johnson, 2013: 155; Wasserman & Faust, 1994:124-5, 509)	The extent to which a tie from A to B is matched by one from B to A.	$R = \frac{\text{No. of Dyads with Reciprocated Ties}}{\text{No. of Connected Dyads}}$	Range [0, 1] It measures either reciprocity or agreement.

In the analysis chapter, different network analysis and visualization softwares (i.e., UCINET, Netdraw, Pajek, and Gephi) were used, so concepts and terms that were beyond the basic ones defined above were explained when they were used.

### **3.5. Survey Data Analysis Procedure**

The first research question that the network analysis attempts to answer is “How did the participants acculturate at the EWC community?” This was done by characterizing the community’s social networks with different structural indicators.

#### RQ 1 Network Representation of Acculturation

Several indexes that characterize the social networks of the community, such as density, centralization, diameter, and component, were calculated and reported. These are measures at the network level that indicated to what extent people in this network are connected to each other, how centralized or fragmented the network is, how reachable it is to go from one actor to another, etc. These indicators provide a rough overview of how people were related with each other by the two relations studied here.

Subgroups in the network were also analyzed based on structural clustering and cultural composition. The groups were empirically identified by Markov clustering algorithm implemented in UCINET. Then the distribution of attributes of the nodes in each cluster were examined and reported, especially with regard to cultural mixing patterns.

The common mechanisms, homophily and proximity, for forming social ties were examined. This is to see how much the overall structure could result from these forces and how big difference cultural similarity made in this equation.

It should be noted that statistical inferential analysis using network variables is different from standard statistical tests, as Hanneman and Riddle (2005) explained in Chapter 18 in their online textbook Introduction to social network methods,

*“..., many of tools of standard inferential statistics that we learned from the study of the distributions of attributes do not apply directly to network data. Most of the standard formulas for calculating estimated standard errors,*

*computing test statistics, and assessing the probability of null hypotheses that we learned in basic statistics don't work with network data (and, if used, can give us "false positive" answers more often than "false negative"). This is because the "observations" or scores in network data are not "independent" samplings from populations....*

*The standard formulas for computing standard errors and inferential tests on attributes generally assume independent observations. Applying them when the observations are not independent can be very misleading. Instead, alternative numerical approaches to estimating standard errors for network statistics are used. These "boot-strapping" (and permutations) approaches calculate sampling distributions of statistics directly from the observed networks by using random assignment across hundreds or thousands of trials under the assumption that null hypotheses are true."*

Similarly, Snijder (2011) summarized the dependency of network data due to reciprocity, homophily, and transitivity and proposed three ways of handling it: (1) incorporating network structure through covariates (longitudinal design, pre-treatment network measure); (2) controlling for network structure (permutation procedure); (3) modeling network structure (representing network dependency explicitly in a stochastic model). The last one was tried using PNet which implements the Exponential Random Graph Models (Lusher, Koskinen, & Robins, 2013). The simulation and statistical tests used in the PNet software were supposed to reveal the basic mechanism of network tie formation. However, because of the large amount of missing data, the large number of cultural groups involved, and the limited number of respondents from each, none of the tested models converged in the end, so the results are not reported.

Thus the alternative approach "permutation procedure" was used. The regression analyses were run using UCINET, a software specially programmed for network data analysis that implements Quadratic assignment procedures (QAP). QAP is the conceptual equivalent of general linear regression procedures except that the former use permutations to develop statistic distributions (Krackhardt, 1988). Variables used in each

regression model are listed in Table 12 below. In the next chapter, the results of the model testing were reported.

**Table 12. Tested Models on Mechanism of Network Tie Formation**

		<b>SOCIAL &amp; CLOSE Networks</b>	
<b>Mechanism</b>	<b>Model 1</b>	Homophily	Measures: Gender, Region, Country
	<b>Model 2</b>	Proximity	Measures: Building, Floor, Kitchen
	<b>Model 3</b>	Homophily & Proximity	All of the above

The dependent variable relation (reported links between two actors) is at the dyadic level. The two independent variables were calculated from the personal attributes and transformed into a similarity matrix. The homophily indicators used include gender, nationality, and cultural regions for the full network (N=280); and religion, ethnicity, language, age, and months in Hawai‘i were used as well for the complete-case networks (N=150). Dorm locations were measured at three levels (building, floor, and kitchen) and used as proximity indicators.

One more thing that should be noted here is that the significance test in full network analysis is different from conventional statistics in the sense that the testing statistics are developed from permutations of the relations within the studied population. In other words, a significant result from permutation regress does not mean that the same effects can be generalized to other networks formed by people of similar demographics. It only indicates that given that many other hypothetical networks could be generated by the same population, the actually observed one and its structure is unique due to certain tie-formation mechanism and less likely a random result.

## RQ 2 Adaptation

Adaptation scores were calculated directly from the two scales used in the survey after missing values were replaced as both were summative scales. Each individual has two aggregated scores representing their adaptation: socio-cultural and psychological adaptation. The self-reported GPA range was also used as an additional indicator of their academic adaptation. Descriptive statistics were used to report the general patterns of these adaptation scores of this population as well as for different cultural groups.

RQ 3 Adaptation ← Acculturation Modes (structure measure)

The acculturation modes as independent variable were operationalized by nodal level eigenvector centrality scores. Then, regression analyses were run to see how much the network structure explain the adaptation variance among the respondents.

To summarize, all variables and their measurements used in quantitative analysis to address the three research questions are shown in

Table 13 for easy reference.

**Table 13. Variables and Measurements**

RQ		VARIABLE	LEVEL	MEASUREMENT
<b>Q1</b>		<b>How did the EWC participants acculturate in this multicultural community?</b>		
1.1	\	EWC Social Network	Community	Density, centralization, reciprocity, clustering coefficients, etc.
1.2	\	Cultural groups and structural clusters	Group	Structural cluster (Markov clustering) and cultural composition
1.3	DV*	Relational ties	Dyadic	Self-reported ties for socialization and close friends
	IV*	Homophily ties	Dyadic	Same country and region
	IV	Proximity ties	Dyadic	Same floor and kitchen location in the dorm
<b>Q2</b>		<b>How well did the EWC participants adapt?</b>		
2.1	\	Socio-culturally	Individual	Sociocultural Adaptation Scale (SCAS)
2.2	\	Psychologically	Individual	Schwartz Outcome Scale (SOS)
2.3	\	Academically	Individual	GPA
<b>Q3</b>		<b>What's the relationship between their acculturation and adaptation?</b>		
3.1	DV	Adaptation	Individual	Sociocultural Adaptation Scale (SCAS)
	IV	Network Characteristics	individual	Eigenvector centrality
3.2	DV	Adaptation	Individual	Schwartz Outcome Scale (SOS)
	IV	Network Characteristics	individual	Eigenvector centrality

\*DV = Dependent Variable; IV = Independent Variable

### 3.6. Interview Data Analysis Procedure

The interviews were transcribed into text data for analysis. First, segments of transcripts were marked and coded with multiple keywords to winnow important constructs and themes with regard to the previously reviewed literature on acculturation and adaptation. In the second round of coding, the keywords were sorted and grouped into units of constructs, such as social activities, cultural learning, religious practices, etc. Views about one’s own ethno-cultural group and other cultural groups within this community were grouped by national or regional categories according to the labels used by the interviewees. Representative quotes were also marked as authentic perspectives from the insiders on their acculturation. In the third round of coding, six themes emerged and codes were re-organized into subcategories under each (as listed in Table 14).

**Table 14. Interview Coding Scheme**

<b>Themes</b>	<b>Description</b>	<b>Sub-Categories</b>
<b>Acculturation</b>	Statements about the daily routines and social life at the center	Social activities, Friendship, Communication with home, Language, Particular places etc.
<b>Adaptation</b>	Statements about changes in one’s cognition, behavior, and emotion regarding other cultures	Cultural learning, Changes, Mental well-being, Gained Perspectives, Religion, Networking, etc.
<b>Community</b>	Statements about the EWC in general	Observation, Positive aspects, Negative aspects, Leadership, Hale Mānoa, Hale Kuahine, etc.
<b>Cultural Groups</b>	Statements about people from other cultures	Americans, Chinese, Indonesians, Hawaiian, Okinawan, South Asians, Vietnamese, etc.
<b>Pre-EWC</b>	Statements about life before joining the EWC	Expectation, Local connections, Alumni contact, Prior intercultural experiences or training
<b>Feedback</b>	Statements about the way the study was conducted	Comment on study

The information obtained from the interviews was mainly used to aid the interpretation of the results of the network analysis from the participants’ perspectives. Specifically, statements about the overall social relations within the community and within or between different cultural groups were used to validate or interpret the quantified patterns of connections in the networks. Statements about the effects of living

in this multicultural community provided richer context in addition to the measured domains. Other personal background information obtained is helpful for understanding the particular position an interviewee occupied in the community's networks.

To conclude, this chapter laid out the steps taken to complete this study. The population and the community in focus were described to provide a socio-cultural background for the analysis. It then documented how data were collected and cleaned for network construction and how missing values were treated. Basic network measures and terminologies were explained and their formula listed. The coding schema used to analyze the interview transcripts was also documented and how the research questions were addressed quantitatively and qualitatively was summarized.

## **Chapter 4. Data Analysis**

This case study investigated three generic research questions about the acculturation experiences of the students at the East-West Center: (1) how did they acculturate in this multicultural community; (2) how well did they acculturate (i.e., adaptation); and (3) how is their way of acculturation related to their adaptation? A full-network analysis was applied to enable equal representations of all cultural groups on site. This inclusive discourse makes more sense to the discussion of the acculturation behavior and outcomes in this unique community, where mainstream host culture is hard to define and interactions take place not just between co-nationals and host-nationals. In this chapter, the analysis results from the networks and the interviews are presented in the order of the three research questions under separate sections and are interpreted in relation to the dominant theoretical framework.

### **4.1. Population Demographics**

This first section reports the demographic composition of the EWC participant community and descriptive statistics of the respondents who took part in the survey. As stated in the previous chapter, there are 280 registered participants (including short-term and long-term programs) in the academic year of 2012 Fall to 2013 Spring according to the EWC directory. The official directory provided the complete information of name,

gender, nationality, the EWC scholarship program, and the UH study program for all. So, the full-networks of the community have no missing values on these individual attributes data, but the relational data were incomplete as the relations from and between non-respondents were not counted. Most of the analysis used the networks with nodes of all participants (i.e. N280S for SOCIALIZE relation, directed, and N280C for CLOSE friendship relation, undirected) by default, unless otherwise stated.

Table 15 shows the survey coverage breakdown by cultural regions of the participants in the EWC 2012-2013 directory. South Asia and places other than Asia-Pacific or the U.S. are the two best covered regions as over 70% participants from these areas took the survey. The other regions all have coverage of at least 45%. A 100% coverage will be ideal for such a full-network analysis, but simulation experiments have shown that major structural indicators of the network characteristics won't be seriously affected if the coverage is above 50% but not perfect, especially in terms of degree (or in-degree in directed network) centrality (Kossinets, 2006).

**Table 15. Survey Response by Regions**

Code	Regions*	Survey Respondents	Directory Participants	Coverage (%)
1	East Asia	37	75	49.33%
2	South Asia	19	27	70.37%
3	Southeast Asia	42	85	49.41%
4	Pacific Islands	11	24	45.83%
5	US	29	52	55.77%
6	Other	12	17	70.59%
	<b>TOTAL</b>	<b>150</b>	<b>280</b>	<b>53.57%</b>

\*Note: Countries included in each region can be found in Table 4

The survey collected additional individual attribute variables such as age, dorm location, religion, language, and ethnicity, but there are at least 130 missing values for these attributes when analysis is done using the complete community networks. Among the 150 respondents, the mean age is 31 with a standard deviation of 6.15. The youngest is 22 and the oldest is 57. On average, they have been living in Hawai'i for 28 months (over two years). As shown in Figure 15 (Panel A), most of the respondents are between the ages of 25 to 35. This is understandable as the EWC mainly sponsors graduate studies. There are a small number of undergraduates and some visiting scholars and professionals

(affiliated to the center), who are the few younger or older ones. Most of the participants are enrolled in long-term degree program, so the length of stay spreads around 1 to 3 years. There are a small portion of new comers (less than 1 year). There are participants who were born in Hawai'i or have moved here long ago before affiliated with the Center, so the number of months could amount to over five years.

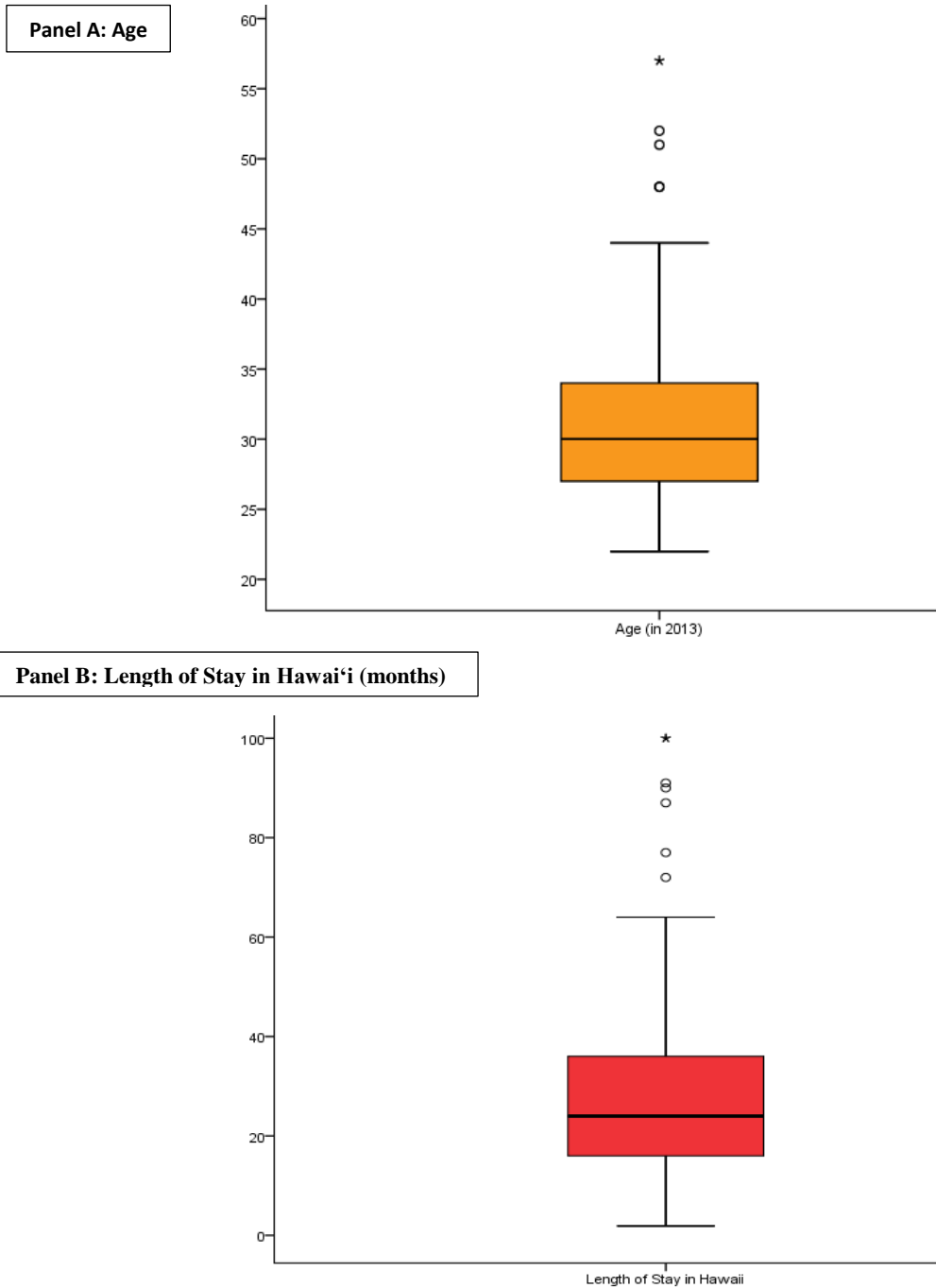
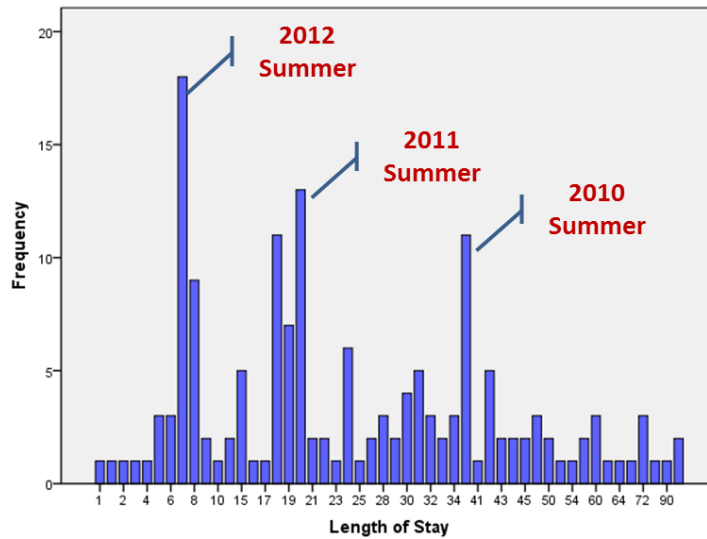


Figure 15. Boxplots: Survey Respondents' Age and Length of Stay in Hawai'i

In addition, the distribution of “length of stay” in Hawai‘i fluctuated by semesters and peaked at regular intervals (see Figure 16). The EWC admits new participants for each semester, but the enrollment in the fall is proportionally larger than the spring semester. The EWC also requires newly affiliated participants to take part in the orientation program (later renamed as the Community Building Institute in 2012 Fall), so most students enrolled for fall semesters started living in Hawai‘i the summer of that year. These features are visible in Figure 16.



**Figure 16. Bar Chart: Survey Respondents’ Length of Stay by Entry Year**

Among the 150 survey respondents, the ratio between male and female is roughly 2 to 3, which is similar to the gender composition in the community (see Table 16). Although slightly more females took the survey, the statistical test showed no significant difference ( $\chi^2 = .684, p = .469$ ) regarding the percentage of gender distribution between respondents and non-respondents of the survey. So the representation of the community is not biased in terms of gender composition.

**Table 16. Crosstabulation of Respose Status by Gender**

		Response Status		Total
		Non-respondent	Respondent	
Gender	male	61	63	124
	female	69	87	156
Total		130	150	280

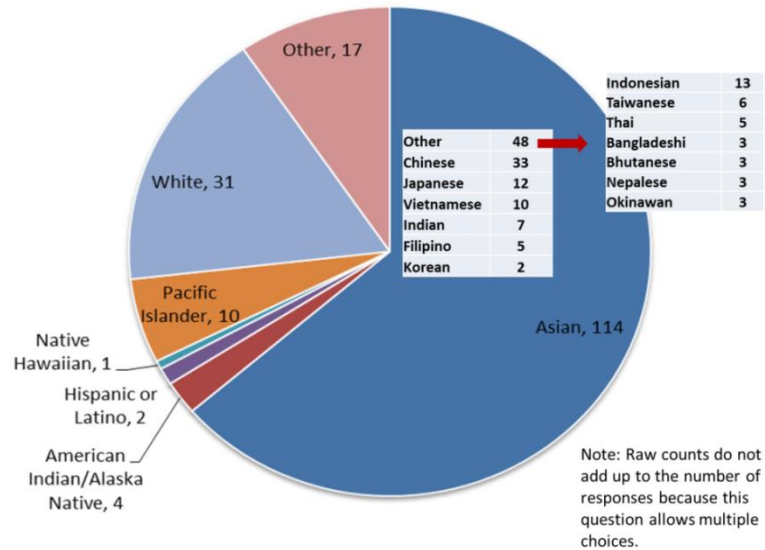
Survey respondents' residential locations closely reflect the options in this community (see Table 17). As stated in the previous chapter, the two residential buildings (Hale Kuahine and Hale Mānoa) provide housing for the majority of the participants. Their holding capacity is 1 to 4, which is roughly the same ratio observed in the survey responses. Participants who have dependent children with them are required to rent off campus housing, which constitutes only a very small portion in this case (3.3%).

**Table 17. Respondents by Dormitory**

	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative Percent</b>
<b>Building 1: Hale Kuahine</b>	26	17.3%	17.3%
<b>Building 2: Hale Mānoa</b>	119	79.3%	96.7%
<b>Off campus</b>	5	3.3%	100.0%
<b>Total</b>	<b>150</b>	<b>100.0%</b>	

As for relational status, 66 out of the 150 respondents are single. Among those who are in a relationship, slightly over half of them (46) do not have their partners join them here. 23 of the 150 respondents (~15%) are parents.

Given that the information about ethnicity is not available from the directory list, the survey provided a multiple-choice question to collect data on this. Figure 17 showed an overview of the ethnic composition of the respondents. Further examination of the data showed that the majority selected one ethnical identity and only 14 identified with more than one. Among the 29 host-national respondents (i.e., the Americans), about half categorized themselves as white only. The rest include 8 self-identified as Asian, 1 as Pacific Islander, 1 as Hispanic, and 5 as multi-racial. This is not surprising as the Center tended to sponsor American participants with an interest in Asia-Pacific regions and are willing to study a language used in those regions.



**Figure 17. Pie Chart: Survey Respondents' Ethnicity Composition**

The religions practiced by the respondents and respondents' family were also asked. The choices (see Table 18) by the respondents showed that the general distribution of different religions do not differ much, but there is a slight decline in the number of people who keep practicing the religion in which they were raised. Over one third of the total 150 respondents (~37%) are not practicing any religion now. This was validated by the later selection of "non-applicable" for Item 7 in the Socio-Cultural Adaptation Scale as it is about keeping religious traditions.

**Table 18. Religion: Family Tradition and Self-Practice**

	In which religious tradition did your parents raise you?		Which religion are you currently practicing (if any)?		
	Frequency	Percent	Frequency	Percent	
Valid	Buddhist	26	17.3%	19	12.7%
	Christian	45	30.0%	36	24.0%
	Hindu	13	8.7%	10	6.7%
	Jewish	2	1.3%	2	1.3%
	Muslim	14	9.3%	13	8.7%
	Taoism	4	2.7%	0	0.0%
	Catholic	6	4.0%	4	2.7%
	Other	5	3.3%	8	5.3%
	N/A	33	22.0%	56	37.3%
	Total	148	98.7%	148	98.7%
Missing	0	2	2	1.3%	
Total	150	100.0%	150	100.0%	

There is not much difference in terms of social media use among respondents. Out of the 150, 141 have account(s) at social media sites (e.g., Facebook, Google+, Orkut, etc.) and over 90% of them logged on Facebook in the last week. They mainly use these sites to stay in touch with friends (i.e., chatting, sharing, and posting) and the world (i.e., checking news feed, and commenting).

There are 60 distinctive languages named by the 150 respondents as their native languages or foreign languages they have learned or are learning. According to the survey responses, the top 5 languages other than English (see

Table 19) that are spoken or learned by participants in this community are Chinese, Japanese, French, Indonesian, and Spanish. Twenty-nine respondents speak more than one native language.

**Table 19. Top 10 Languages Spoken by the Participants**

Rank	Languages*	Count
1	Chinese	41
2	Japanese	37
3	French	29
4	Indonesian	16
	Spanish	16
6	German	9
	Vietnamese	9
8	Hindi	7
	Thai	7
10	Arabic	6
	Nepali	6

\*Note: English is excluded.

The summary of the results from the first part of the survey indicates that the EWC student community provides a multicultural and multi-lingual context for acculturation with a large proportion of Asian cultural origins. Half of the host-nationals in this community have Asia or Pacific ancestry and could speak one of the languages in those areas. The majority of students live in the two dormitory buildings on campus and there are slightly more female participants than males. Most of the participants who responded to the survey have lived in Hawai'i for over two years and are on average in their late twenties or early thirties. About two thirds of the respondents were born in religious families and most of them are still practicing a religion.

## **4.2. Acculturation Patterns in the Community Network**

The social network structure described and analyzed here is populated by answers to the second part of the survey on “who do you socialize with” (multiple choices among all EWC 2012-2013 participants with photos) and “who do you feel the closest to” (up to 6 ordered free nomination). The demographic description of the respondents already showed that this community provided a unique socio-cultural context for acculturation. The following subsections continue to quantify the patterns of social relations and interactions within this community. Several network measures are presented to characterize the community as a whole and information obtained from the interviews are cited to provide insiders’ perspectives for understanding the observed network features.

### **4.2.1. Characteristics of the Community Networks**

The basic measures of each SOCIAL network are reported below in Table 20. Taken together, they provide a rough picture about the networks’ cohesion (or connectedness). Three networks constructed slightly differently with the same data are contrasted here to provide perspectives on the range of these indicators given different ways of treating missing data.

Table 20. Structural Description of the SOCIAL Networks

Relation Structural Indicators	SOCIALIZATION (directed)								
	N150S			N280S			CL-N280S		
# Nodes	150			280			280		
# Ties	8011			11680			15349		
Density	0.358			0.150			0.196		
Degree Distribution	Min	Avg.	Max	Min	Avg.	Max	Min	Avg.	Max
in-degree	12	53	95	2	42	95	2	55	214
out-degree	0	53	145	0	42	272	0	55	272
<b>Out-Degree</b>									
Centralization	61.89%			82.84%			78.12%		
<b>In-Degree</b>									
Centralization	28.10%			19.17%			57.26%		
Degree Assortativity	-0.055			-0.092			-0.230		
No. of Weakly Connected Components (WCC)	1			1			1		
No. of Strongly Connected Components (SCC)	2			132			2		
Percent Vertices in Largest SCC	99.33%			53.21%			99.64%		
Reciprocity	0.695			0.477			0.841		
Transitivity*	0.599			0.452			0.452		
Mean Clustering Coefficient*	0.624			0.620			0.620		
Mean Geodesic Distance**	1.656			1.751			1.820		
Directed Diameter**	3			3			3		
Modularity (Q)***	0.103			0.146			0.147		

\*Transitivity and Mean Clustering Coefficient are named differently in different network analysis software. Here the labels follow Pajek's convention because they are more straightforward and differentiable.

\*\*If the graph is not strongly connected, only existing paths are used.

\*\*\*This is the highest modularity of the graph among different ways of partition.

Although **density** is a frequently reported measure for networks, it is not so comparable across different types and sizes of networks. Dunbar (2008) argued that individual social networks have a characteristic size of around 150 and distinct structure based on his review of evidence from behavioral ecology, neuropsychology, evolutionary anthropology, and social network theory. The implication of Dunbar's conclusion for interpreting network density is that the increase in network size after a certain level is likely to result in a decrease in density as it is getting harder and harder for anyone to be

connected to everyone. Borgatti and his colleagues (2013) came to the same conclusion from their years of work on network analysis as well that “densities are almost always lower in large networks than in small networks” (p. 151). So they recommended that network density, mean degree and transitivity be considered together when one characterizes a network.

**Degree**, or degree centrality, is the most straightforward measure for nodes in a network. It is the count of ties that link an ego-node to the rest of nodes in the same network. For a non-directional network, the count is just the number of ties a node has. For a directional network, there are both in-degree and out-degree measures depending on the direction of the ties counted. The sociological significance of these two measures varies by the nature of the networks. For example, in a network that transmits infectious disease, a high in-degree healthy person will be more likely to catch the disease from others; while a high out-degree person with the disease should be quarantined as he/she has the potential to pass it on to more. If the network is about seeking help or support, then the high in-degree person plays the role of an expert or with rich resources and a high out-degree person will be in need of whatever is sought through the network relations. In this study, the network of socialization is directed and the nodes with incoming ties are those being selected by the respondents as socializing partners in the survey. So the in-degree indicates social popularity and out-degree reflects one’s gregariousness. The interpretation of out-degree should be cautioned and not overstretched. The variations in the numbers could be the result of different understanding of the concept “socializing”. There could also be a tendency to select as many as possible if one’s culture values well-connectedness or one feels obligated to identify familiar faces in a tight community. Another reason could be the easiness of selection due to the picture-format.

As mentioned in Chapter 3, the complete-case N150S network is fully populated by the most sociable people in this community and it includes only those who responded to the survey. So the average degree in this network is larger than the other two. The CL-N280S network is of the same size as that of N280S, but slightly denser because the missing ties from non-respondents to respondents were added artificially. This is likely an overestimation given that non-respondents are less sociable. The mean degree in these

social networks indicates that each participant at the EWC socializes on average with about 42 others in the same community. That is to say that among every 7 participants in the community, there is someone with whom one can hang out. It is a sign of a closely-knit network as well.

The **degree centralization** of the graph provides information about the variation of the nodal degree distribution in the network. The larger the percentage is, the more centralized the network is. In other words, the degrees centralize on a few nodes in the network rather than distribute evenly across them. The socializing networks at the EWC are more centralized in terms of out-degree and less centralized in in-degree measures. It is understandable as the 130 non-respondents all have zero out-degree which distorted the distribution, while in-degree is not so much affected by missing values of non-respondents (Borgatti, Carley, & Krackhardt, 2006). The CL-N280S network artificially inflates the in-degrees of the nodes whose out-degrees are high and reduces the number of nodes with zero out-degrees. This explains why out-degree goes down and in-degree goes up in this version of the network, which sets the upper bound of this indicator. In the context of this study, a plausible explanation of the measures is that there existed a wide variety in the socializing capacity within the community reported by the respondents. In other words, there are a dozen very gregarious people in this community. The in-degree distribution is less hierarchical. In other words, the nominations of people do not heavily center on just a few popular “social stars”, but gradually and more linearly distributed among many (see Borgatti, Everett, & Johnson, 2013 for more examples). This is somewhat unusual for human social networks as the degree distribution tend to follow power laws. That is a few people are well connected (several nodes with high degrees) and the rest are only connected to a few (long tail for nodes with low degrees). It could be due to the missing values from non-respondents, who are more likely to be in the tail.

**Degree Assortativity** refers to the assortative mixing of degree in the network. In other words, it indicates whether nodes with high degree are more likely to connect to other nodes with high degree and low degree nodes with other low degree nodes. In a sense, it can be interpreted as the correlation coefficient of node degree (Newman, 2010: 229). The degree assortativity for both N150S and N280S is around 0, which suggests that there is little assortative mixing by degree. In other words, in this community, the

gregarious people do not preferentially socialize with other gregarious people. In the CL-N280S network, because the incoming ties to non-respondents were forced to be reciprocal, it imposed more connections between high-degree nodes and low-degree nodes. So its assortative coefficient is distorted.

**Components** are nodes that are connected in a network. The weakly connected components (WCC) refer to nodes that are connected somehow regardless the direction of ties, while the strongly connected components (SCC) take the direction into consideration. So in an undirected network, the number of WCC and SCC are equal. This indicator provides a rough picture of how much the network is connected. Nodes in the N280S network are all connected in one weak component. There are more strongly connected components if the tie direction is considered because 130 nodes have no outgoing ties at all. For the N150S network, in which there is no missing value for ties, the number of SCC is dramatically reduced to two. Even for the CL-N280S which used imputation to partially compensate the missing ties from non-respondents, the number of SCC is just two. This suggests that overall the network is well connected both weakly and strongly.

**Reciprocity** looks at the cohesion of a network at dyadic level. A dyad consists of two nodes and is one of the basic structural components in a network. There are three types of dyads: null, asymmetrical, and mutual/reciprocal dyads. A dyad is null if there are no ties between them; a dyad is asymmetrical if only one tie exists from one to the other not the other way around; a dyad is mutual if both ties from one to the other are present (Wasserman & Faust, 1994:124-5). For directed relations, such as help giving or advice seeking, reciprocity measures literally how much of the action initiated by one is answered by the other. On other occasions, reciprocity could simply mean the agreement between a dyad on a given relation that connects them (Borgatti, et al., 2013:155). In this study, the reciprocity measure should be interpreted more appropriately in the latter way as the consensus between two participants regarding whether they mutually consider each other as a socializing partner. The reciprocity rate in N280S is 47.7%, which suggests that among those one claimed to socialize within this community, about half acknowledged this connection. Both the N150S complete-case network and the CL-N280 networks have higher reciprocal rates because there are no or fewer missing ties.

**Clustering coefficients** are measures of network cohesion at the triadic level. There are two types of them, namely **transitivity** and **mean clustering coefficient** (aka Watts-Strogatz clustering coefficients), which capture respectively the global and local structural characteristics of the networks. Transitivity measures the proportion of closed triads within a network. It reflects how density is distributed across the network. The overall network clustering coefficient is between 0.33 and 0.47. This means that among all pairs of people who share a common friend, 33% to 47% of the times the two in the pairs are also connected. The mean clustering coefficient is calculated by taking the average of the ego-network transitivity across all nodes. It indicates the probability that a pair of friends of the ego are also friends. But this indicator is likely to be biased towards low-degree nodes because their smaller denominators, thus providing a less accurate representation of the entire network (Newman, 2010: 203).

The **geodesic distance** refers to the shortest path between two nodes in a graph, which is a useful concept to understand the reachability or flow in a network. Relatedly, the **diameter** refers to the longest shortest path in the network, which is the upper bound of distance between any pair of nodes. On average, it takes less than 2 steps to reach anyone within the major component and the longest it takes is just another extra step. Both suggest that people are well connected within this community. In other words, if one wants to know someone else in this community, it is not too hard to find an intermediate person from one's own socializing circle who can do the introduction.

**Modularity**, as explained in Chapter 3, reflects how much structure there is in a network. The highest it can be is 1. The modularities of all three networks are all around 0.15, which indicates the lack of structure that can result in easy partition of the network. This reflects the cohesiveness and well-connectedness of the community as well. Table 21 shows the choices made in the multiple-choice question about the common socializing occasions. The popularity of these activities might explain the overlapping social circles among the participants and the high transitivity observed in the SOCIAL network. The interviewees shared similar views about the cohesiveness of this community as what is reflected in these multilevel measures of the community's SOCIAL network. These numerous opportunities organized by both the center and the EWCPA board provided convenient platforms where participants can mingle with others.

**Table 21. Socialization Occasions at the EWC**

<b>Socialization Occasions</b>	<b>Frequency*</b>
1. Gatherings, parties, potlucks, and cooking	<b>119</b>
2. Attending EWCPA organized events (e.g., International Potluck, Concert at the Lawn, East West Fest, etc.)	<b>130</b>
3. Going out (e.g., dinners, movies, pubs, games, etc.)	<b>127</b>
4. Volunteering and community service	<b>98</b>
5. Working out and sports (e.g., jogging, yoga, badminton, volleyball, swimming, surfing, etc.)	<b>105</b>
6. Reading and studying	<b>78</b>
7. Religious practice (e.g., going to church, praying etc.)	<b>40</b>
<b>Other:</b> <i>e.g., hanging-out in the kitchens, halls, or lobby; EWCPA Board meetings; social media; card games; attending events by various associations; texting/ messages, emails, phone, Skype, Facetime; bumping into each other on public transit</i>	<b>14</b>

\*Only the 150 directory respondents' choices are counted here and on average each respondent made over 3 choices.

Compared to the SOCIAL networks, the CLOSE networks have much fewer connections because nominations on the survey were capped at six for each respondent. Given that these are the top six one feels closest to, the relations were considered as strong emotional ties, which are highly likely to be mutually acknowledged, so the data were symmetrized for analysis. Table 22 reports the general structural characteristics of the N280C (undirected) and the complete 150-case network and the cleaned version of the same network to provide a range of possible indicators.

**Table 22. Structural Description of the CLOSE Networks**

Relation Structural Indicators	CLOSE FRIENDSHIP (Undirected)								
	N150C			N280C			CL-N280C		
# Nodes	150			<b>280</b>			280		
# Ties	774			<b>541</b>			1082		
Density	0.034			<b>0.014</b>			0.014		
Degree Distribution	Min	Avg.	Max	Min	Avg.	Max	Min	Avg.	Max
Total degree	0	5	15	<b>0</b>	<b>4</b>	<b>16</b>	0	4	16
No. of Weakly Connected Components (WCC)	3			<b>59</b>			59		
No. of Strongly Connected Components (SCC)	3			<b>59</b>			59		
Percent Vertices in Largest SCC	98.67%			<b>79.29%</b>			79.29%		
Degree Assortativity	0.174			<b>0.165</b>			0.165		
Transitivity	0.199			<b>0.180</b>			0.180		
Mean Clustering Coefficient	0.253			<b>0.222</b>			0.222		
Mean Geodesic Distance	3.500			<b>3.949</b>			3.949		
Undirected Diameter	8			<b>9</b>			9		
Modularity (Q)	0.525			<b>0.565</b>			0.565		

The CLOSE networks are much less dense compared to the SOCIAL networks of the same sizes because of the limitation set on nomination. Generally speaking, people tend to have a much smaller circle of contacts as intimate and strong relations than that of casual socialization relations, so the restriction on the maximum number is reasonable. The degree distribution indicates that respondents on average have 4 close friends within this community with the maximum of 16. The numbers of weakly connected components and strongly connected components are the same because the ties are undirected in this network. There are 58 isolates in total, which by definition are separate components each of its own. In other words, there is only one big component that covers ~ 80% of the nodes and the rest are all isolates. The degree assortativity coefficient is positive and larger than that of the socialization network. This implies that those who have many close friends within this community are slightly preferentially connected with others who also have many close friends. Compared to the socializing network, both local and global clustering is low. This is not surprising as these indicators are function of the number of ties given the same network size. On average, it takes about 4 steps to connect one person

with everyone else within the major component. The longest it takes are 9 steps as the diameter indicates. The modularities of all three are high at about 0.5 compared to the socialization networks. This indicates that the close friendship networks have more structural variations regarding node cluster and this is explored and explained in the next subsection.

Figure 18 shows both the SOCIAL and CLOSE networks of the community to provide a visual illustration of the characteristics discussed. The visualizations were done in Netdraw 2.134 using layout “spring embedding”. That means nodes are placed closer to each other if they share connections with many others. The size of the node is based on the degree centrality (i.e., the number of alters the ego is connected to). For the directed SOCIAL network, in-degree was used because it is less biased by the missing values. The color represents the six cultural regions and the shape as gender (i.e., triangle for males and circle for females). The density of these networks is easily visible. Judging from the visualization, it seems that people in this community mingle well with each other regardless of gender or cultural differences. Such an observation is further supported by statistical tests reported in the subsection 4.2.3.

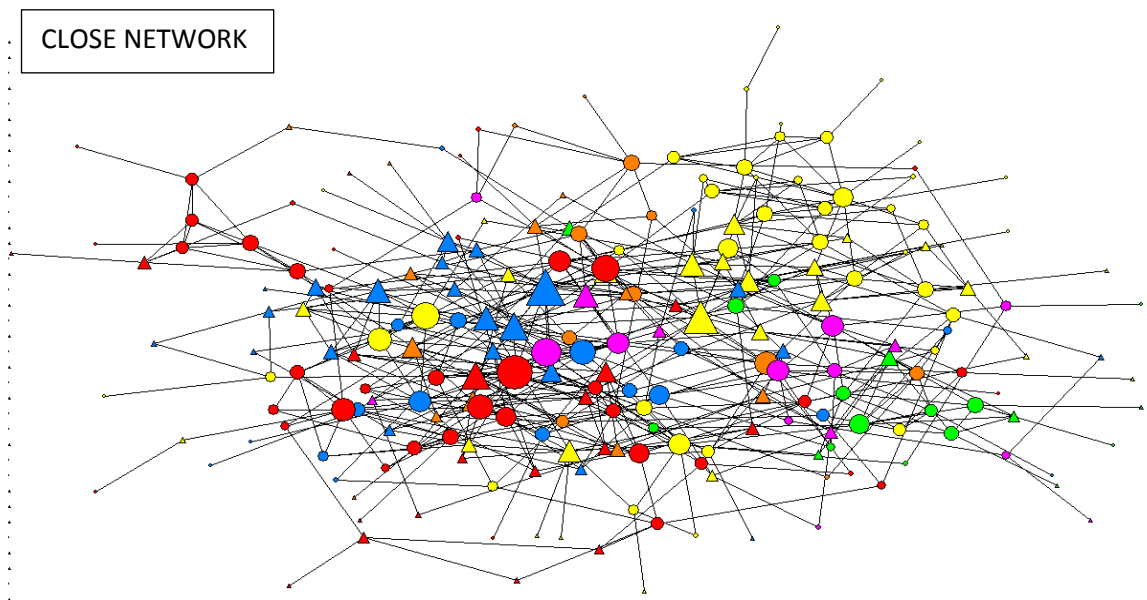
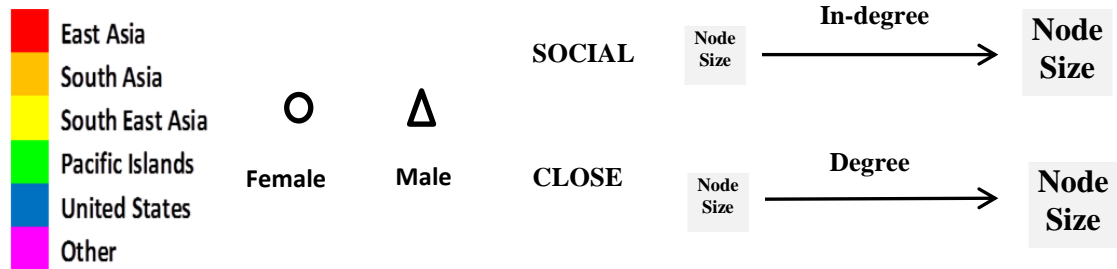
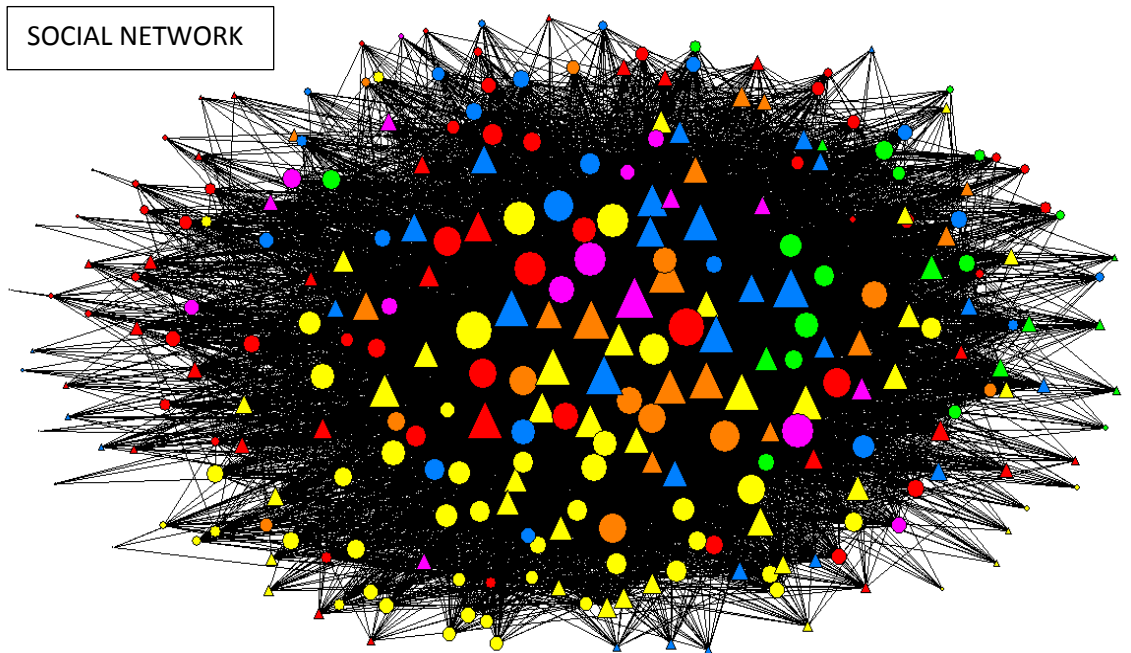


Figure 18. Graph: Community's Full-Networks on SOCIAL and CLOSE Relations

In the interviews, participants often described the EWC community as being “really interconnected”, “well mixed”, “embracing diversity”, “very socially and culturally supportive community” that provides a “healthy social life”. These characteristics make them “feel like a local, not a stranger or outsider”, and thrilled to find out that “people are eager to learn about my culture”.

Besides these favorable comments, one particular negative side of the tightness in this community surfaced a few times in the interview. Several mentioned that when relationship broke up or harassment instances occurred, participants felt afraid of being in conflict with friends’ friends, which is highly likely given the interconnectedness of this community. One interviewee mentioned that it was particularly hard when the “drama” is on because one could be friends with both sides.

Assortative mixing in a network refers to the phenomenon in which nodes exhibit a preference to connect with others who are similar in some way (Newman, 2003). Degree assortativity looks at the correlation between individual’s connectivity, while nominal assortativity tells to what extent nodes of the same attribute are connected with each other. In this particular case, assortative coefficients for sex, country, and region were calculated in both SOCIAL and CLOSE networks. The results are presented in Table 23. The coefficients for the socializing network are all around zero, which means neutral in assortativity. In other words, the participants in this community socialize with no preference for people of the same or different gender, from the same or different countries or cultural regions. On the contrary, the choice of close friends is more discriminating and demonstrates some preference for people of the same gender, country, or cultural region.

**Table 23. Normative Assortative Mixing in SOCIAL and CLOSE Networks**

<b>Assortative Mixing</b>	<b>N280S (directed)</b>	<b>N280C (undirected)</b>
<b>Sex</b>	0.08	0.26
<b>Country</b>	0.06	0.33
<b>Region</b>	0.10	0.37

To summarize, the observed density, reciprocal rate, transitivity patterns, number of components, and low modularity of the networks, all support the claim that the EWC is a well-connected and cohesive community. Interviewees’ comments also suggest that

the participants were much aware of such characteristics of the community and they generally felt good about that. Comparatively speaking, people tend to discriminate more on gender, country, or cultural region differences when it comes to close friendship, but care less when it is socialization relations. This can be seen as a reflection of the mode of “integration” in Berry’s model as both contacts with other and home cultures are maintained. But it also shows that even the same acculturation mode could be adopted to different extent in public and private spheres.

#### **4.2.2. Cultural Groups and Network Clusters**

This subsection reports the results of analyzing the network groups from two perspectives: (1) when groups are defined structurally by interpersonal connections within the network, what kind of cultural mix patterns are observed; (2) when groups are defined by nationalities, what are the observed patterns of acculturation within and between groups.

Given the low modularity of N280S network, it is not surprising that the partition of it by algorithm did not yield meaningful results. On the contrary, N280C network has more structure in it and allows for more analysis to be done. The Markov-clustering function in UCINET was applied to the N280C network. The clusters were identified by relational patterns detected in the networks and people who are grouped together have more connections within the cluster than what is expected if the ties are placed randomly. This is a different and complementary approach to analyzing shared cultures regardless the labeling of individuals by nationality, race, or ethnicity.

Specifically, the Markov clustering algorithm partitions a graph into non-overlapping clusters. The algorithm determines the appropriate number of clusters deduced from the structural properties of the graph (van Dongen, 2008). Altogether 40 clusters were identified after 14 iterations. Such clustering result achieved a modularity  $Q$  of 0.456. This suggests a fairly adequate partition of the community’s network (Newman, 2006:8580). Each node was assigned to one of the clusters. The average size of the 40 clusters is 7, so all clusters that have size equal to or larger than 7 are checked out. Table 24 showed the 15 clusters in the order of their size and with descriptions of their cultural composition based on nodes’ attributes within each cluster.

**Table 24. Top 15 Markov-Clustered Groups in CLOSE Network**

Rank	Cluster	Cluster Description	Size
1	Cluster 2	Multicultural but not all connected (from 21 nations)	64
2	Cluster 32	Vietnamese	13
<b>3</b>	<b>Cluster 13</b>	<b>Multicultural group (from 6 nations)</b>	<b>12</b>
4	Cluster 7	Pacific Islanders 2	11
<b>5</b>	<b>Cluster 8</b>	<b>Multicultural group (all from Asia)</b>	<b>11</b>
<b>6</b>	<b>Cluster 18</b>	<b>Multicultural group (from 6 nations)</b>	<b>11</b>
<b>7</b>	<b>Cluster 10</b>	<b>Multicultural group (from 6 nations)</b>	<b>8</b>
<b>8</b>	<b>Cluster 36</b>	<b>Multicultural group (East Asia and US)</b>	<b>8</b>
9	Cluster 1	Chinese (Mainland and Hong Kong)	7
<b>10</b>	<b>Cluster 5</b>	<b>Multicultural group (from 6 nations)</b>	<b>7</b>
11	Cluster 6	Pacific Islanders 1	7
<b>12</b>	<b>Cluster 14</b>	<b>Multicultural group (from 5 nations)</b>	<b>7</b>
13	Cluster 22	Indonesian	7
14	Cluster 31	Bicultural group (Vietnamese and Micronesian)	7
15	Cluster 40	Taiwanese	7

**Cluster 2** is the largest one that contains 64 individuals from over 20 nations. It looks like a very multicultural group. A closer look at the nodes in this cluster showed that most of them are actually isolates and only six are connected to the major component. It is intriguing why they were clustered into the same group by the algorithm and no satisfactory explanation was found. The other seven clusters that are also multicultural (see the bolded and shaded rows Table 24) did not have this problem. A possible explanation is that the isolated nodes are treated by the algorithm as residuals after partition and grouped together at the end.

Individual attributes of the nodes in **Cluster 13** reveal that most of them are males and Americans. They are from three EWC programs (Graduate Degree Fellowship, Asia-Pacific Leadership Program, and Student Affiliates). According to the interviews, this is a very closely bonded circle of friends with the same vision and background of being one multicultural person, so striving to bridge in the community across cultural groups.

**Cluster 8** consists of more female participants (64%) than males from East, South, and Southeast Asian countries. Among all the other factors, opportunities for contact and religion similarity seem to be the factors that have contributed to such bonding. Most of the participants in this cluster live on the same floor of one of the dorm buildings and

actually half are on the same kitchen side. The majority were raised up in or are practicing Buddhism or Hinduism. Interviews with those from this cluster corroborated with this reasoning.

**Cluster 18** contains several very active community members from both dorm buildings. 6 out of the 11 members of this cluster are EWCPA board members. Gender distribution is fairly even with 6 males and 7 females. Half of them are Americans and the rest except for one are from Southeast Asian countries. Most of them have been in Hawai‘i less than one year.

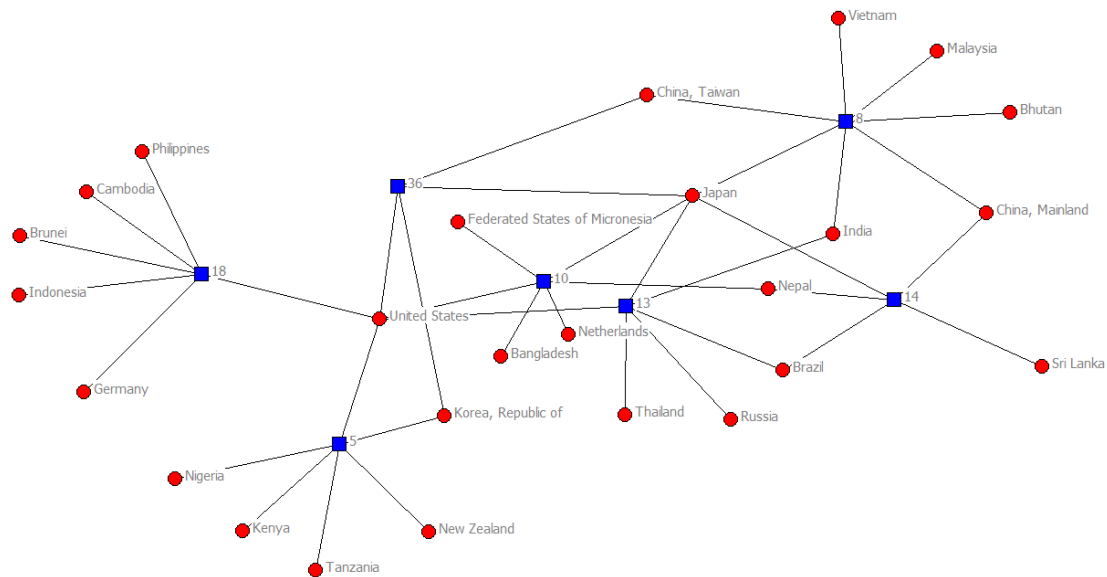
**Cluster 10** is a group that is not only diverse in cultural composition but also religious beliefs. Although only eight fall into this group, the religious practices identified include Buddhism, Christianity, Hinduism, Muslim, and non-applicable. All of them except for one are female and all have been in Hawai‘i for over one and a half years at least. According to the interviewees, this group likes performing instruments and dancing to engage the community.

**Cluster 5** seems to be home for the few from Africa, who are on the same type of scholarship. Most of them are about ten years older than the average. This age gap might have separated them from others and at the same time bonded between them as one interviewee suggested. Another noticeable commonality is that half of them who responded to the survey indicated they have been raised up in and/or still practicing Christianity as their religious belief.

Participants in **Cluster 14** are all females. The majority are from South Asia. Half of the group are from the Asia-Pacific Leadership Program which has ended before the survey, so did not respond. In a few pages, we found that only a few from this cluster were shown in the connected component of the Simmelian graph, which suggested that a small core of this cluster stay very close with each other. They happen to be from the same country in South Asia and shared the same religion Hinduism.

To better visualize the multicultural composition of these clusters, a two-mode network was constructed using the connection between clusters and nationalities of the nodes (see Figure 19). In this illustration, blue squares represent clusters and red circles represent countries. A tie between a cluster and a country means that the cluster consists of someone from that particular country. For example participants grouped into cluster 18

are from Philippines, Cambodia, Brunei, Indonesia, and Germany. It also demonstrates that the multicultural clusters vary considerably in terms of cultural composition. For example, Cluster 8 has participants all from Asia and Cluster 36 is a mix of people from America and East Asia.



**Figure 19. Graph: Multicultural Clusters Visualized in 2-Mode Network**

The clustering algorithm also identified several mono-cultural groups. They are the Vietnamese (**Cluster 32**), the mainland Chinese (**Cluster 1**), Indonesians (**Cluster 22**), and the Taiwanese (**Cluster 40**) respectively. Most of the interviewees were aware of these relatively homogeneous cultural groups. The Vietnamese group was unanimously acknowledged as a shy and introvert group, not very good at communication with others. They have their own student association which organized a lot of social gatherings, and they sometimes travel together to the mainland. The interviewees from Vietnam commented that they were “not trained to work for the community” at home, so not many “did volunteer work given the total number of them here”. These probably explained why they were identified structurally as a group. Others noticed that the Vietnamese appeared uncomfortable when strangers are around and very “humble and soft-spoken almost to a fault”, but soccer seemed to provide a good platform to mingle with some of them as many would join the practice.

The mainland Chinese group is perceived as staying all together, “seems to know each other”, and not enthusiastic about the community’s social activities because they seldom had any booth set up for the East West Fest or International Potluck. They have an association, but not all are associated with it. This association also has a close relation with a local Chinese American Christian group. The Taiwanese group has their own entertaining activities going on regularly (e.g., Mahjong, drinking, and dining). They also have their own student association which organizes activities from time to time. People who cannot speak Chinese or have no regional interest seldom can tell the differences between the mainland Chinese and the Taiwanese. But people from each group and those who study Chinese are normally aware that there are some in each group who socialize mainly within their own group.

Perceptions of the Indonesians are in agreement among all interviewees who mentioned this cultural group. They are very close with and supportive of each other. They are proud of their culture and are very open and willing to invite others whenever they have an event. They also have a dedicated student association that all Indonesians automatically become member of after coming to Hawai‘i.

Put together, such mono-cultural clusters seem to be related to the size of the co-nationals locally and the existence of nationality-based student association. Interviews with people from these groups and also field observation suggest that the nature of these associations affects differently how they interact with other cultures and whether people from other cultures perceive their mono-cultural cohesion as positive or negative.

Even with the help of the clustering algorithm, the structural characteristics are not much visible in the graph given the well-connectedness of the network. So, further procedure was taken to filter out weaker ties and highlight structurally stronger ties. Krackhardt (1999) writes that, “two people are ‘Simmelian tied’ to one another if they are reciprocally and strongly tied to each other and if they are each reciprocally and strongly tied to at least one third party in common” (p. 186). The assumption is that the more common friends two persons share, the stronger and more confining their relation is because each will have multiple sources to validate information from the other. So a **Simmelian tie matrix** was derived from the N280C network in order to capture better the embeddedness of the participants in the community network and the results are reported

with regard to what was discussed about clusters in the N280C. In UCINET, the number of Simmelian ties between each pair of actors were counted for the triads shared between a dyad and recorded in an adjacent matrix. For example, if actor i and j are in three separate triples together then the Simmelian matrix will have a three as the weight value of the tie (i.e., in row i column j and row j column i in the corresponding matrix). Krackhardt and Kilduff (2002) argued that “Simmelian ties are dyadic in nature (they occur between pairs of people) but they require more than dyadic information to ascertain” (p. 284). In other words, it is a good representation of the extent that a node is embedded because it carries information on triadic connections. In this case, the Simmelian ties in the N280C network represent the proportion of close friends a dyad share within this community. A Markov clustering algorithm was applied to find out structurally clustered groups in the derived graph, which resulted in 21 of them. The clustering adequacy was checked and  $Q = 0.699$ , which indicates the partition is satisfactory.

Figure 20 shows the visualization of the matrix with isolates removed. It used the spring embedding layout and the relative positions of each cluster to the others are stable. In this layout, nodes that have more ties with most others tend to be pulled into the center and those connected with only a few tend to be pushed to the peripheral. The nodes are colored by the 21 clusters identified by the Markov clustering algorithm. The width of the ties corresponds to the number of commonly shared friends by the connected pair. In other words, the wider the ties are, the more friends the dyads share. There are 139 isolates (no connections to any others) in the network and they were omitted from the graph and the analysis. The country codes were not fully disclosed to ensure confidentiality as certain countries had only one or two participants. The graph showed 141 (50.4%) connected nodes in five separate components. The main one connects 90% of the nodes. The other four components are all of or under the size of 4. It is clear visually that different cultural groups socialize differently. This graph is analyzed by looking at how people from the same country were grouped structurally and what that tells about their acculturation patterns.

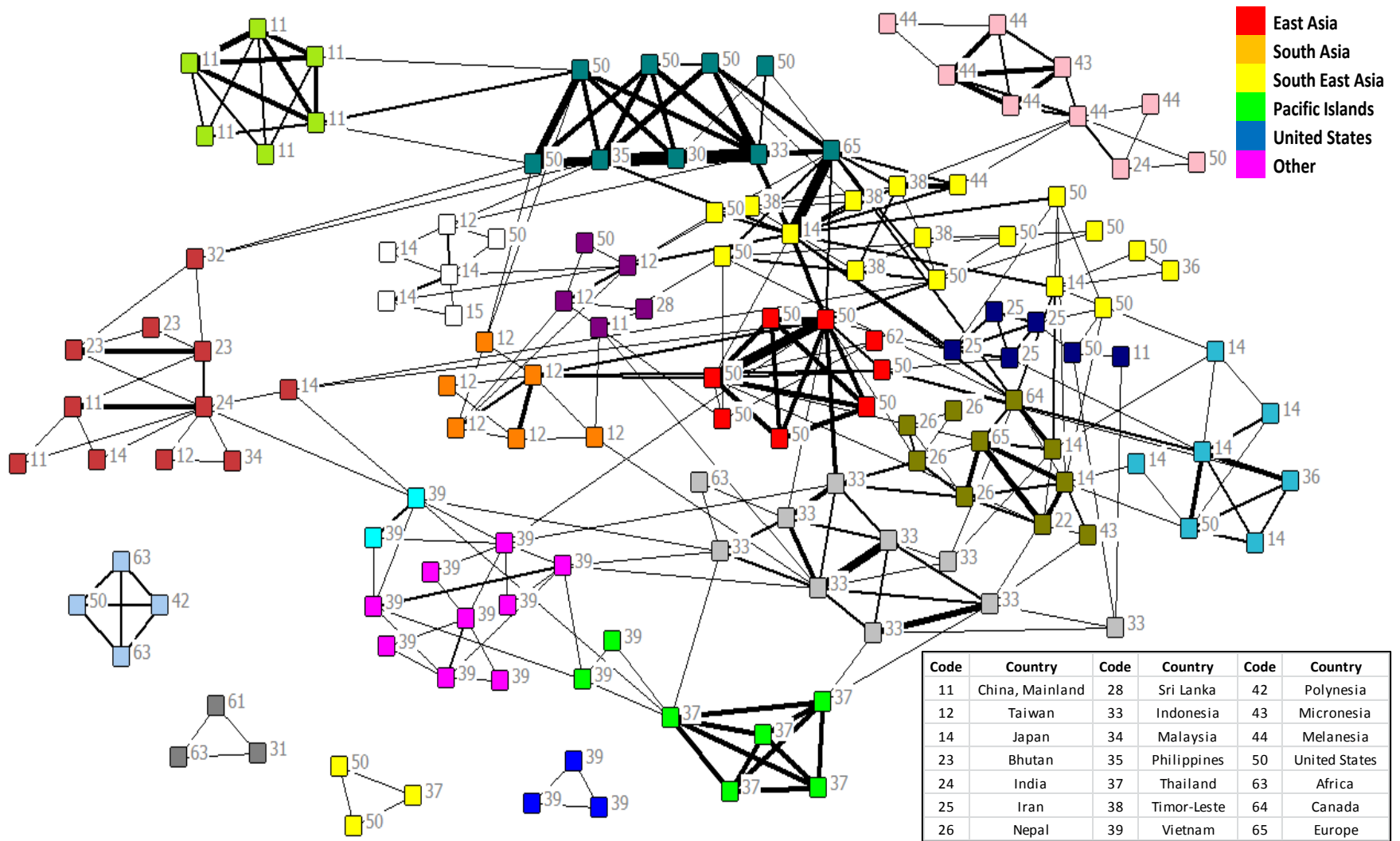


Figure 20. Graph: Simmelian Network Labeled by Country and Colored by Clusters (Ties representing the Number of Shared Friends between Two Friends)

Fifty-two current participants at the Center are from the United States. The network connections showed that the **Americans** (Label 50) in this community interact with others in three ways. A group of them are clustered together with Southeast Asians (Indonesians and Malaysians) and also maintain some close connections with East Asians from China, Taiwan, and Japan. Another group is at the center as one tight cluster. They are well embedded in the web of connections between all the other clusters. In other words, they each reach out from their own circle and connect different groups with this core. The rest falls sporadically in different clusters. Interviews suggested that some of them became good friends with someone from places they have little knowledge about just by chance and later on were introduced into a completely different circle of friends. For example, they happened to be neighbors in the same unit, or have traveled to or lived in the same place before.

There are altogether 27 participants from the mainland **China** (Label 11). Some of them formed a small exclusive cluster (the upper-left corner of the main component). The connections between them suggest they are a very close group and do not share many friends with outsiders except with a few Americans. Other Chinese in the same map are seen to mingle with the Taiwanese, the Japanese and the South Asians. The **Taiwanese** group (Label 12) also formed a relatively exclusive and homogeneous cluster, but has more connections with other clusters in this network, thus is much closer to the center of the network in this layout.

Participants from **Vietnam** (Label 39) are the second largest group by number in this community. There are 32 of them in total including isolates not shown on this graph. They were grouped into four clusters. One is a small 3-person clique completely separated from the main component. Nine of them formed a big homogeneous cluster and is connected to the main component. Two of them form a small cluster that bridges the bigger group with the East and Southeast Asian cluster. Another two are also connected with the big homogeneous cluster but are closer with and belong to the same cluster where most participants from Thailand are in. The ties between the Vietnamese are relatively thin compared to other strongly connected clusters, which could mean either most of them did not have a big friend circle or they did not share many friends. According to the interviews, the perceptions of the Vietnamese group are that they tend

to keep to themselves and there were internal conflicts that split this sub-community. It seems that both were faithfully reflected in this visualization. Another interesting comment from an interviewee about these two cultural groups is that she felt that “the Vietnamese group was less supportive than the Thai”, which corresponded to the much thicker lines among the Thai participants and thinner ones among the Vietnamese group. It was also mentioned in the interviews that the Vietnamese were closely connected with other local Vietnamese and Southeastern Asian communities in Honolulu.

There are several other tightly and strongly connected homogeneous clusters shown in the graph: the **Thai** group (Label 37, at the middle bottom), the **Indonesian** group (Label 33, at lower part in the middle), and the **Melanesians and Micronesians** (Label 44, on the right upper hand), which have respectively 11, 14, and 11 participants listed in the directory. All these groups were mentioned in the interviews as visible sub-communities that have a strong sense of ethnic identity. The Thai and Pacific islanders’ clusters both are peripheral and the Indonesian cluster is much closer to the center in this layout. This in a sense reveals their varied extent of embeddedness in this community.

There are 27 **Japanese** participants (Label 13, including those from Okinawa, but unidentifiable given the data available). Those appeared on this graph spread across the whole community without a cohesive homogeneous clique, but a few of them are well embedded in the community. From the interviews, it appeared that some Okinawans are the most active and involved members of the community.

There are altogether 5 current participants from **Iran** (Label 25) **and 4 are shown on the graph**. They are identified structurally as a small cluster together with other two nodes and are very well connected both internally and externally.

Participants from **Nepal** (Label 26) are grouped into one very multicultural cluster together with people from East Asia, Southeast Asia, the Pacific region, Canada, and Europe. They are also closer to the center of the graph and well-connected with many other clusters. Participants from **Timor-Lest** (Label 38) are also found to be well integrated in the community and are structurally grouped, together with some Americans, into one cluster.

To summarize, this sub-section zoomed in to the CLOSE network and derived a Simmelian network from it to see what kind of strongly-connected clusters (structurally speaking) exist in this community. The analysis showed that both nominal categories of culture and groups based on social relations are instrumental in understanding the acculturation context and behaviors in this community. In the next sub-section, statistical tests are conducted to see how much the two most common mechanisms (i.e., homophily and proximity) of tie formation account for the establishment of social relations in this particular case.

#### **4.2.3. Homophily and Proximity Effects**

Previous subsections have characterized this community's social networks as densely connected and heterogeneous in cultural mixing in a descriptive manner. These features were quantified further in this part. Specifically, the common-sense hypotheses that people tend to socialize and make friends with those who are similar and who are in physical proximity are tested to see whether these mechanisms for tie formation still hold in this particular case, and if so, to what extent. The regression models used are:

- (1) Homophily (operationalized as same gender) → Connections
- (2) Homophily (operationalized as same country/region) → Connections
- (3) Proximity (operationalized as dorm kitchen) → Connections
- (4) Homophily + Proximity → Connections

These models are tested using QAP regression/Double Dekker Semi Partialling/MRQAP function in UCINET. The procedure was explained in Section 3.5 in Chapter 3. The results are reported in Table 25. The homophily and proximity mechanisms were checked in both SOCIAL and CLOSE networks. All of the models can only explain less than 10% of the existence of social ties between a dyad, but they are all statistically significant at 0.01 level. The unimpressive R-squares actually reflected an unusual phenomenon of the absence of the “birds of the same feather flock together” phenomenon. In other words, the commonly observed homophily effect in human socialization was not salient in this community. The reasons might be twofold. First of all, the sizes of many cultural groups (by nation or region) were small, so there were simply

not enough people around to satisfy one's homogeneous socialization needs, which forced people to step out of their cultural zones and make friends with those from other cultures. However, socializing patterns did not seem to differ along the size of cultural groups in this community. Secondly, this is the desired outcome of cultivating an integrated multicultural community, in which homophily effects take place on a deeper level regarding shared beliefs, values, and other things beyond superficial cultural differences.

The proximity factor is measured by the dorm kitchen location in the two buildings. The model results suggest that people from the same kitchen tend to socialize together ( $R^2=0.028$ ,  $p<.01$ ) and have more chance to become close friends ( $R^2=0.017$ ,  $p<.01$ ), but the effect was not much, either. This indicates that opportunity for meeting up and mingling together does help build multicultural social ties. However, the unimpressive explained proportion of the variances (2.8% and 1.7%) indicates that this community was so well mingled that not much of forming a connection could be attributed to sharing the same kitchen. But, cognitively, kitchen mates and unit friends were frequently mentioned in the interviews and reaching out to people from other cultures was often attributed to living in the same building, floor, unit, or using the same kitchen.

When the two factors were considered together, the explained variance was increased a little bit in both social and close networks. For socializing behavior, cultural similarity and dorm proximity together can account for 4.1% of social ties ( $p<.01$ ). In terms of close friend circles, people from the same country and also live close to each other tend to form social ties ( $R^2 =0.06$ ,  $p<.01$ ). It is interesting to notice that in the socializing network, culturally similar regions matter more than countries as a homophily predictor, while in the close friend network, countries as a predictor account more for the presence of a tie. This suggests that while people in this community socialize, cultural similarity was not confined to nations but expanded to regions. This is understandable in this particular population because many neighboring countries in Asia and islands in the Pacific share to a considerate amount their cultural roots. However, for the development of strong ties between close friends, one still seems to prefer those from the same country. Shared memories of living environment, social and historical events, and entertainment

media programs were cited by interviewees as the reasons that they felt closer to people from the same country or region.

Note that this particular QAP function in UCINET does not allow for missing values, so all the models above were tested using N150 complete-case networks. There is the possibility that the unimpressive percentage of variance explained by homophily and proximity results from the incomplete representation of the population. But overall, cultural similarities defined as gender, nation and region where one originally came from did not contribute much to the formation of social ties in this community. Since cultural diversity is what the Center promotes, this result is reassuring and promising.

**Table 25. Regression Models on Homophily and Proximity**

Model	$R^2$	Adj $R^2$	P-value	Permu-tations	Variables	Coefficients		P-value	SE
						Std.	Un-Std.		
SOCIAL	0.001	0.001	0.001	2000	Sex	0.03	0.04	0.0005	0.005
					Intercept	0.21	0.00	0.0000	0.000
					Region	0.10	0.10	0.0005	0.011
					Intercept	0.21	0.00	0.0000	0.000
(3)	0.028	0.028	0.001	2000	Kitchen	0.27	0.17	0.0005	0.017
					Intercept	0.44	0.00	0.0000	0.000
(4)	0.041	0.041	0.001	2000	Region	0.14	0.11	0.0005	0.017
					Kitchen	0.27	0.17	0.0005	0.016
					Intercept	0.41	0.00	0.0000	0.000
Model	$R^2$	Adj $R^2$	P-value	Permu-tations	Variables	Coefficients	P-value	Std	Err
CLOSE	0.001	0.001	0.001	2000	Sex	0.01	0.03	0.001	0.001
					Intercept	0.01	0.00	0.000	0.000
					Country	0.06	0.14	0.001	0.001
					Intercept	0.01	0	0	0
(3)	0.017	0.017	0.001	2000	Kitchen	0.07	0.13	0.001	0.006
					Intercept	0.03	0.00	0.000	0.000
(4)	0.060	0.060	0.001	2000	Country	0.15	0.21	0.001	0.007
					Kitchen	0.07	0.13	0.001	0.005
					Intercept	0.02	0.00	0.001	0.000

### 4.3. Acculturation Outcomes

The characteristics of the EWC community networks offer a glimpse about how the participants acculturated in this particular social context with regard to their

socialization and friendship. The second research question to be addressed is how well they have acculturated. Research on this outcome construct indicated that it involves two independent domains: sociocultural (behavioral) and psychological (emotional) adaptation or adjustment (Ward and Kennedy, 1993, 1994, 1999). The sociocultural adaptation is developed from the culture-learning framework and often measured by the skills acquired by the acculturating person so that he or she can fit in the new cultural community and behave properly. In other words, it is about “doing well” in the new social environment. The scale used in this study to measure this domain is derived from the composite Sociocultural Adaptation Scale (SCAS). The psychological domain is better understood in the stress-coping framework that focuses on how well the immigrants, refugees, or sojourners feel. It is often measured by general life satisfaction, depression, or homesickness, etc. (Ward, 1996; Ward & Kennedy, 1993, 1999). In this study, the shortened version of Schwartz Outcome Scale-10 (SOS, Blais et al., 1999) on general life satisfaction was used for this domain. As the literature suggests, although socio-cultural adaptation and psychological well-being are two independent domains of adaptation, they are also inter-related. This study found a moderate correlation between the SCAS and SOS scores ( $r=.527, p<.001$ ).

In addition, the majority of the EWC community are graduate students, so they were asked to self-report their GPAs in the survey as an indicator of their academic adaptation. The following sub-sections reported the overall acculturation outcomes in these three domains, respectively.

#### **4.3.1. Socio-Cultural Adaptation**

The acculturation outcome of the survey respondents was measured using the 17-item Socio-Cultural Adaptation Scale. The reliability test<sup>4</sup> shows that items in this scale are consistent in general (Cronbach’s  $\alpha=0.866$ ). Changes in Cronbach’s alpha if an item is deleted were also checked and no big difference was identified. The frequency

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<sup>4</sup> Since the testing of the scale reliability is not related to the status of EWC affiliation, as it was for constructing networks, scores from all survey respondents whether they are on the 2012-2013 EWC directory list or not were used to check scale reliability.

distributions of the responses crowded at the higher end of the scale; that is, the majority of the respondents reported having no or little difficulty to most of the statements.

The missing values by items or by cases were treated before calculating the summative scores for each on the SCAS. There are two types of missing values: the non-applicable (N/A) option and the non-responded ones. Table 26 summarized the patterns of N/A options by scale items and cases.

**Table 26. Missing Value Summary in SCAS**

<b>Item/ Case</b>	<b>Explanation</b>	<b>Missing Value Cells</b>
SCAS07	Item 7: Worshiping in my usual way.	34 N/A
SCAS10	Item 10: Dealing with someone who is unpleasant.	7 N/A
SCAS17	Item 17: Expressing my ideas in class.	6 N/A
RID126	Respondent ID number	17 N/A
RID16	Respondent ID number	11 N/A
RID47	Respondent ID number	5 N/A

It is understandable that Item 7 (Worshiping in my usual way) got the highest frequency of N/A, because a considerable proportion of the respondents are not religious. All except for Item 7 in the SCAS scale have less than 3.3% missing values. As full-network analysis involves every node in the population, it is preferable to replace the missing values with appropriate estimates. According to Downey & King's (1998) study, when the proportion of missing values by person or by items is under 20%, summative scores using either person mean or item mean substitution for missing values, can both achieve high reliability. However, the patterns summarized in Table 26 make it difficult to calculate both for certain cases. To solve this problem, the relative mean substitution (RMS, Raaijmakers, 1999) was used here. In Rodriguez de Gil, & Kromrey's (2010) simulation studies, four ways of treating Likert-type scale missing data were compared, results suggest that the RMS works the best and creates the least bias. The reason is that the RMS treatment takes into consideration the individual mean, the scale mean, and the item mean while calculating the substitution. Using the SPSS script provided in Raaijmakers (1999), the missing values in both SCAS were replaced by the relative means. Also, to reflect the semantic meaning better, the SCAS scale was recoded reversely so that higher scores correspond to better adaptation (i.e., less socio-cultural difficulty was experienced).

Table 27 shows the descriptive statistics of the SCAS scales for all 150 EWC current participants (after missing values being replaced by relative means). It is clear that ratings on all items are negatively skewed, which suggests clustering of scores on the higher end of the scale. The kurtosis (peakness) of the distribution is not far from normal curve in most cases, except for item 7 in SCAS.

**Table 27. Descriptive Statistics of SCAS by Item**

SCAS Statistics	Mean	Median	Std. D	Var	Skewness (SE=.20)	Kurtosis (SE=.39)
(1) Making friends	4.21	5.00	1.02	1.04	-1.09	.27
(2) Using the public transport system	4.39	5.00	.85	.72	-1.38	1.54
(3) Making myself understood	4.17	4.00	.95	.90	-1.13	1.08
(4) Getting used to the pace of life	4.32	5.00	.90	.81	-1.35	1.61
(5) Going shopping	4.45	5.00	.80	.64	-1.48	1.67
(6) Going to social events/ gatherings	4.26	4.65	.91	.83	-1.18	.83
(7) Worshipping in my usual way	4.50	5.00	.89	.79	-2.27	5.46
(8) Talking about myself with others	4.00	4.00	1.00	1.00	-.70	-.25
(9) Understanding jokes and humor	4.07	4.00	1.04	1.08	-1.05	.55
(10) Dealing with someone who is unpleasant	3.51	4.00	1.03	1.06	-.39	-.36
(11) Communicating with people of a different ethnic group	4.26	4.00	.77	.59	-.76	-.05
(12) Understanding Hawaiian local words and expressions	3.53	4.00	1.04	1.08	-.42	-.52
(13) Living away from family members	3.73	4.00	1.25	1.56	-.68	-.58
(14) Understanding what is required of me at university	4.26	4.64	.90	.81	-1.15	1.09
(15) Coping with academic work	3.83	4.00	1.03	1.07	-.62	-.13
(16) Dealing with administrative staff at the university	4.06	4.00	1.06	1.13	-1.01	.31
(17) Expressing my ideas in class	3.76	4.00	1.14	1.29	-.77	-.09

As Item 7 is the least relevant, the final score of SCAS summed only the other 16 items. After it was deleted from the scale, the Cronbach's alpha was increased to 0.92. This 16-item summative score was used as an individual attribute in further regression analysis together with other network structural variables.

Table 28 shows that on average, the respondents scored 64.8 on the SCAS between the range of 16 to 80. This clearly shows that participants in this community experience little difficulty in social and cultural adaptation in general. One-way ANOVA test indicates that there is no statistically significant difference across cultural regions.

**Table 28. SCAS Summative Score Descriptive**

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
						Statistic	SE	Statistic	SE
<b>SCAS</b>	150	37.00	80.00	64.8089	8.95774	-.737	.198	.306	.394

#### **4.3.2. Psychological Well-Being**

Responses to the 10 items in SOS scale are tested and its scale reliability is satisfactory (Cronbach's  $\alpha=0.941$ ). The Cronbach's alpha's change if an item is deleted is checked and no big difference is identified. All but one item on SOS-10 have correlation coefficients over 0.5. Most of the respondents report feeling well and satisfied most or all of the time (option 5 and 6).

Like SCAS, SOS is a summative Likert-type scale. But it had no N/A option and did not show systematical missing value patterns. Only one respondent (RID 128) has 9 missing values on the 10-item scale; three others (RID 185, RID 200, RID 204) have 1 missing value on one item only. To keep the consistency, all missing values in the SOS-10 were also treated using the RMS method. Higher scores on SOS represent a higher level of satisfaction with life, which corresponds to better psychological adaptation. Table 29 shows the descriptive statistics of the SOS scales for all 150 EWC current participants (after missing values being replaced by relative means). Similarly, the ratings on all items are negatively skewed, which indicated the clustering of scores on the higher end of the scale. The kurtosis (peakness) of the distribution for all items is not far from normal curve.

**Table 29. Descriptive Statistics of SOS by Item**

SOS Statistics	Mean	Median	Std. D	Var	SkewnessKurtosis	
					(SE=.20)	(SE=.39)
(1) Given my current physical condition, I am satisfied with what I can do	4.32	5.00	1.61	2.59	-.95	.29
(2) I have confidence in my ability to sustain important relationships	4.34	5.00	1.64	2.69	-1.00	.23
(3) I feel hopeful about my future	4.71	5.00	1.36	1.85	-1.16	1.00
(4) I am often interested and excited about things in my life	4.69	5.00	1.36	1.84	-.98	.24
(5) I am able to have fun	4.76	5.00	1.39	1.92	-1.02	.21
(6) I am generally satisfied with my psychological health	4.61	5.00	1.44	2.07	-1.06	.42
(7) I am able to forgive myself for my failures	4.24	4.50	1.58	2.51	-.81	.11
(8) My life is progressing according to my expectations	4.30	5.00	1.49	2.22	-.86	.01
(9) I am able to handle conflicts with others	4.41	5.00	1.38	1.92	-.87	.33
(10) I have peace of mind	4.61	5.00	1.47	2.17	-1.11	.52

Table 30 shows that on average, the respondents scored 45 on the SOS between the range of 11 to 60. So, generally speaking, participants felt good about their life now. A one-way ANOVA test shows no statistically significant difference between groups.

**Table 30. SOS Summative Score Descriptive**

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
						Statistic	SE	Statistic	SE
<b>SOS</b>	150	11	60	44.99	11.877	-.771	.198	-.093	.394

### 4.3.3. Academic Performance

The academic adaptation is measured using grade point average (GPA) reported by the survey respondents themselves. The frequency distribution of the result is reported in Table 31. Over 90% are at the highest range between 3.5 to 4.0. This indicates an overall outstanding academic performance. This is not surprising given that all the EWC participants were selected and sponsored partially for their academic merits.

**Table 31. Self-Reported GPA**

	<b>GPA</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Valid	2.9 - 3.1	2	1.3	1.4	1.4
	3.2 - 3.4	11	7.3	7.5	8.9
	3.5 - 3.7	45	30.0	30.8	39.7
	3.8 - 4.0	88	58.7	60.3	100.0
	Total		146	97.3	100.0
Missing	System	4	2.7		
Total		150	100.0		

A few interviewees did mention that they had experienced difficulty in school work and it took them some time to adjust to the American educational system. Some also commented on the hardship of graduate study and struggles with reading and writing in a foreign language, but the social networks formed within this community alleviated most of the difficulty. For example, several interviewees named specific friends whom they could turn to when they need someone to study with, be a sounding board for their presentations, help with reading or language practices, fix computer problems, solve statistical assignments, or consult about how to interact with committee members.

Given the fact that the EWC community is a highly selective and cohesive multicultural group, it is not surprising to find such a high level of adaptation based in these three domains. The next section looks into the possible relations between the individual attributes, network features and the overall satisfactory adaptation.

#### **4.4. Relations between Acculturation and Adaptation**

In this section, the relationship between how the EWC students acculturated and how well they adapted are examined in two ways. The results from regression analysis of the survey data were reported first followed by the insights obtained from the interviews.

##### **4.4.1. Structural Indicators in Networks**

The third research question in this study is whether there is a relationship between acculturation and adaptation when the former is operationalized as network structural variables. The nodal level eigenvector centrality was used as the independent structural variable. This centrality measure is similar to degree centrality, but takes into

consideration the degrees of those connected to the ego as well, so it is better at capturing the network structure's impact on the ego. A node of high degree (i.e., connected with many others) and a node connected to a few high-degree others both can score high on eigenvector centrality. Translated into a sociological understanding, eigenvector centrality is a better measure of acculturation because it measures not only how many one is connected to but also the prestige of one's associates.

Although all variables are at nodal (i.e., individual) level, the regressions needed to be run in UCINET because the assumption of variable independence was violated. The survey respondents were not selected randomly but all belonged to the community from which the full-network was constructed. Therefore, their network features are interdependent and could not be processed in SPSS. UCINET used permutations to get statistic distributions for calculating the significance of the results which allowed autocorrelation.

The nodal eigenvector centralities in the SOCIAL network correlate moderately high with both adaptation scores as  $r_{SCAS} = .701$  and  $r_{SOS} = .686$ . Eigenvector centralities of nodes in the CLOSE network also correlate moderately with the two adaptation scores. The correlation coefficients are  $r_{SCAS} = .518$  and  $r_{SOS} = .468$ . Three models (see Table 32) were run to see whether this structural variable could help explain variations in individual adaptation.

**Table 32. SCAS Regression Models**

Model	Independent Variable(s)	$R^2$	Adjusted $R^2$	F Value	Probability
1	N280S_Eigenvec	0.491	0.488	268.623	0.000
2	N280C_Eigenvec	0.268	0.263	101.942	0.000
3	N280S_Eigenvec & N280C_Eigenvec	0.497	0.491	136.741	0.000

Table 32 showed results of models tested. It can be seen that the best model is the first one which uses eigenvector centrality of the SOCIAL network as the only predictor. It explains 49.1% of the variance in socio-cultural adaptation of the participants. Table 33 shows the coefficients for all models. It means that if one is connected to many others or just a few who are very sociable, it is more likely that one will adapt well socio-culturally. This makes sense as the eigenvector centrality indicates the potential access to resources and support from one's connections in a social network.

**Table 33. SCAS Regression Model Coefficients**

Model		Unstandardized Coefficient	Standardized Coefficient	Proportion as large as	Proportion as small as	Proportion as extreme
1	Intercept	-3.218	0.000	1.000	0.000	1.000
	N280S_Eigenvec	743.191	0.701	0.000	1.000	0.000
2	Intercept	22.302	0.000	1.000	0.000	1.000
	N280C_Eigenvec	353.445	0.518	0.000	1.000	0.000
3	Intercept	-2.069	0.000	1.000	0.000	1.000
	N280S_Eigenvec	674.807	0.637	0.000	1.000	0.000
	N280C_Eigenvec	66.656	0.098	0.126	0.875	0.250

The procedure was repeated to check the relation between the same set of variables and the psychological well-being of the participants and the results shows a similar pattern (see Table 34). Likewise, the regression coefficients are reported for all models in Table 35. The interpretation is the same that the number of connections and with whom one is connected to matter positively for one’s psychological adaptation.

**Table 34. SOS Regression Models**

Model	Independent Variable(s)	R <sup>2</sup>	Adjusted R <sup>2</sup>	F Value	Probability
1	N280S_Eigenvec	0.471	0.467	247.473	0.000
2	N280C_Eigenvec	0.219	0.213	0.000	0.000
3	N280S_Eigenvec & N280C_Eigenvec	0.471	0.466	123.474	0.000

**Table 35. SOS Regression Model Coefficients**

Model		Unstandardized Coefficient	Standardized Coefficient	Proportion as large as	Proportion as small as	Proportion as extreme
1	Intercept	-2.987	0.000	1.000	0.000	1.000
	N280S_Eigenvec	530.689	0.686	0.000	1.000	0.000
2	Intercept	15.926	0.000	1.000	0.000	1.000
	N280C_Eigenvec	232.728	0.468	0.000	1.000	0.000
3	Intercept	-2.767	0.000	1.000	0.000	1.000
	N280S_Eigenvec	517.613	0.669	0.000	1.000	0.000
	N280C_Eigenvec	12.746	0.026	0.382	0.618	0.768

To summarize, the regression analysis results support the general claim that the ability to socialize is conducive to adaptation in general, but the use of eigenvector centrality also indicates that one’s friends’ sociability also matters. Yet, as this is a cross-

sectional study, the causal relationship could be that the better adapted people tend to socialize with more people and have a better chance to be connected to those who are very sociable in the community they live.

#### **4.4.2. Perceptions from the Participants**

To which factors the participants attributed their positive or negative experiences at the Center is one of the core themes focused on in this part. As mentioned in earlier sections, most interviewees commented that they felt good about their life at the Center. When prompted about what might have contributed to this, the interviewees mentioned several factors.

First, knowing an alumni or someone from the residential building seemed to be very common among the interviewees. Many said that these contacts helped them settle down initially. The opportunity to talk in the common space was also often referred to as a means to let go of stress, make friends, and find emotional support. Kitchens and units were the two places that one frequents daily and also where such talk took place the most. Another factor is the affiliation with some cultural associations (at UH or in Honolulu). Several commented that participating in and organizing events with these associations reaffirmed their identity a lot, so they felt good about themselves and their cultures. Also many were excited about having friends from cultures that they never had a chance to interact with before. The prospect of having friends all over the world was perceived as an asset for the future and motivated more contacts between cultures. Overall, the factors that helped with them overcome difficulties or provided support seemed to be much related to connections they formed (either before or after they moved here). In many ways, it is the community that made it easier to establish those ties, which led to the good adaptation of almost all participants. Actually, one quote from the interview captured this phenomenon well: “Something is cultivated here.”

The uniqueness of the EWC community was widely acknowledged by the interviewees. Its physical location between the east and the west, the diverse groups it hosts, and the opportunities it provides for intercultural exposure and interactions were frequently referred to in this sense. Many agreed that multiculturalism here was not just a policy but the essence of the community culture, and they attributed their positive

experiences to this prevailing belief and corresponding practices in this community. The participants felt that the community cultivated multiculturalism, which was the key for developing intercultural understanding and friendship. In other words, many interviewees felt that they became “far richer as a person in a multicultural sense”. Other similar quotations from the interviews are

- *“There is no common sense any more, there are many.”*
- *“Tolerance and compassion is the base of the community. We are more aware of the diversity.”*
- *“Different cultures come together. Some are from conflicting countries and beliefs, but we naturally talk it out and respect each other. “*
- *“Even if people who hate each other, ..., when they get here, you just have to be friends. It’s like having to be friends in another context. I think it is the way the world should be.”*

The dorm building’s design (i.e., common areas on each floor such as kitchens, TV lounges, study lounge, piano room, and shared facility in a unit of ten people for shower and toilet) was widely acknowledged as beneficial for encouraging people to mingle and interact. The events organized by the community and the student board were also mentioned almost by all as contributing to cultivating the sense of community and development of intercultural friendship.

Another contributing factor is the East-West Center Participants’ Association (EWCPA) board. The board was elected by participants on annual basis and generally consists of 20 people. There were no individuals singled out as leaders for this community, but the board was mentioned by over 20 interviewees and its function was much appreciated. They organized and were present at most social events as one of the interviewees said “Being on the EWCPA board, there is a lot of activities that we take care of. And I end up socializing with these different groups, because of my position on the board...”.

It was found that those who have served on the board share some commonalities: caring for the whole community, observant, constantly and consciously reflecting on what makes and breaks the community, taking initiatives and actions for community building. They are concerned when something endangering the community (i.e.,

fragmentation, harassment, suicide, etc.) takes place. They are not afraid of initiating changes or being changed as well. The recently organized EWC Vision 2020 event was a clear demonstration of this team leadership.

Cultural learning is another recurring theme from the interviews. Two example quotes are:

- *“[We] ...learn from each other all the time. I literally mean that I learn something new every day.”*
- *“You know even in the elevator from the 12th floor to the 1st floor, sometimes I learn some amazing pieces of information.”*

The exposure to many other cultures in this community and the curiosity about those cultures also benefited the acculturation process. Clearly, learning itself is not directed towards only one culture. This finding shows that the assumption of behavioral change in acculturation on only two dimensions (heritage or host) is problematic in a multicultural situation. Learning itself is the way to adapt but not its content. However, this kind of learning cannot be captured easily using the standard quantitative measures as they tend to focus on the contents of the learning.

Other difficulties for adaptation mentioned in the interviews include language competence, homesickness, pressure from school work, and some convenience that was available at home but not here (e.g., car, convenient store). But none of these were long lasting nor severe. Other minor complaints about uncomfortableness with different hygiene habits, noise level, or smell were pointed out by a few. But these were treated with tolerance and understanding and not simply attributed to cultural stereotypes as expressed in the quote from one interviewee: “There are 500 of us here. Things happen.”

One important finding from the interview is that the self-organized student associations of different nations or regions played a critical role in the acculturation experience of international students. They all helped participants to settle down at the beginning. For example, most of them organized orientations or parties for newcomers. The orientation covered many essential aspects regarding study at UH (e.g., English tutoring, degree requirements, school facility, etc.) and living in Honolulu (e.g., grocery shopping, banking practice, housing policy, gym use, etc.). Although both the EWC community and UH offered similar programs, the student association orientations were

most welcome because they were given in the native languages of the newcomers, so they would not miss any information and they were given by those who have taken that path recently, so they could feel empathy and be assured that they were not alone on the way.

But these associations also differ considerably in their ways of organization and relations with other groups. Based on the interviewees' description and field observation, there seem to be mainly two types of such associations. One type is relatively exclusive in terms of social interaction. Examples are the Chinese Student Association, the Taiwanese Student Association, and the Vietnamese Student Association. They were often used as an enclave for students to retreat from the larger society and stay with their co-nationals only. They wanted to escape from the tiring struggles of speaking English. They wanted to socialize just like at home. For example, they like playing games in their own language, eating food that people from other cultures might not be fans of, relaxing and drinking without being judged, or talking about things back in their home countries that others might not be interested in knowing about or could not fully understand/appreciate. The acculturation experience was eased in this sense by belonging to such a group, which was shown in the generally good socio-cultural adaptation and psychological wellbeing. However, membership to these associations normally is strictly based on nationality. So, for example, second generation Vietnamese or Chinese from the mainland could not become a member of these groups because they are Americans in the first place. This exclusiveness is clearly reflected in both cultural group and network cluster analysis. Its downside for adaptation is that the socialization of students belonging to these groups was much limited and they were perceived by others as not involving in community affairs enough.

The other type is characterized by an open relationship between the associations and people from other cultures. Examples are the Okinawan Student Association, the Indonesian Student Association, the Southeastern Asian Student Association, and the Pan-Pacific Student Association. Like the previous type, members of these associations also enjoy good in-group relationship, but they also reached out a lot. Such features were well captured by the network visualization as they tended to form their own cliques but also embedded deeply in the community. They turned their associations into a cultural

showcase and sharing platform. They invited others to participate in performing their traditional music and dance, and socializing activities such as kava circle, Ukulele and guitar playing, etc. They shared similar characteristics as the same words were found in the descriptions given by the interviewees about these cultural groups, such as open, inclusive, strong community, inviting, etc. The membership to these associations is not restrictively by nationality and anyone who shows a genuine (personal or academic) interest in their cultures is welcome. Their love for demonstrating their cultures made them more visible and loved in this pro-multiculturalism community. It also heightened their home cultural identity as well. Both interviewees from within or outside of these groups mentioned this change. “It is interesting to see that some Okinawans stopped calling themselves Japanese after they arrived here for a while and began to say proudly that they are Okinawans.” Some did mention that sometimes they had difficulty to balance study and attend the socializing events and performances that they felt obligated to as members of those groups.

However, one interviewee’s comment revealed the real essence of understanding shared by many in this community,

*“So yes, sometimes, I am bothered by the film outside by my window for two hours, on Friday night, but it took me one second to remind myself that this is what we are about. We are about people gather together on the grass, watching an international film, and sparkle discussions after the film. So literally, it takes me a second of awareness about the meaning of the space, that I feel, you know from being annoyed, I move ... to feel proud again of being here and happy for that who make the time to share that experience together.”*

The connections between students and local communities were also found to be an important factor in acculturation. Besides the hosting and welcoming EWC community, some interviewees mentioned their gratitude to the local clubs and associations organized by people from their cultures. They were grateful of the opportunities of becoming more connected to the local community outside of the EWC through interactions with people in those organizations. Because of the method, this study could not gauge the impacts of such relations on the participants’ adaptation. But, it can

be inferred from the interviews that such local connections were instrumental at the beginning stage as well as after graduation when students decided to look for internship or jobs back home or in the U.S.

One of the constraints of the tight community was also mentioned in the interviews. It is hard to handle disputes due to face concerns within such a well-connected community, because people know each other. Some felt it was very difficult to point fingers to someone if they were friends of the same person or they hang out in the same social circles. But some also mentioned that the common friend actually became the conflict mediator and helped solve the problem. This dilemma became more dramatic in romantic relations and that often resulted in the breakup of a group of friends. There were also concerns expressed about using culture as an excuse for misbehaving. These negative sides of a tight community did not show signs of affecting the socio-cultural adaptation of participants, but should be investigated in the future.

A final insight obtained from the interview is the wisdom of diversifying approaches to community building when it contains such a diverse population. One interviewee expressed this concern that social events could help many, but might not be attractive to particular types of persons. An inclusive community should use more ways other than organizing social events for people to bond.

#### **4.5. Conclusion**

This chapter documented the most interesting and significant findings of this research in the order of the three research questions. Overall, participants at the Center are well connected socially within this community, adapted well to both school (high GPA) and the local environment. They reported experiencing no or little difficulty socio-culturally and feeling contented and satisfied most of the time. The scales used for measuring these two outcome variables demonstrate good content validity and satisfactory reliability.

The findings from data analysis suggest that the EWC student participants do socialize across different cultural groups (defined by continental regions) and gender lines. The two dormitory buildings provide both a convenient and constraining platform for the formation of strong social ties (defined as close friends). There are no easily

identifiable subgroups within this community in the SOCIAL network, which seems to be a natural result given the high density and low clustering features of the network. The CLOSE network is different as the number of nominations is restricted to six. It is sparser and more segmented, which explains why more communities are identified algorithmically. The Simmelian tie network provided even more information about the patterns of the interpersonal relations. The analysis of the two networks together reveals that some cultural groups formed more homogeneous clusters by their own; some were equally well-connected within and between cultural groups; and others did not show strong group identification.

In general, the findings of this study agree with what the “integration hypothesis” would have predicted: the embracement of and engagement in heritage culture and that of the larger society come together with well-adaptation. However, the methods allow for more cultures (not specified) to be put into the model as well as the characteristics of the social interactions at the community level.

This atmosphere of integration created by the existing network influenced people, especially new comers, about how they might settle down. The macro-level factor is observable as the resilient and cohesive network structure which keeps the community going. But when sub-communities change, the whole ambience could change as well, thus creating a different experience to those who live here.

## **Chapter 5. Discussion**

In this final chapter, the important findings and how they are related to the previously published acculturation research are summarized in the first two sections. The next section discusses the implications of applying full-network analysis to acculturation research. Implications include new directions that could be taken in theory building; benefits to diversifying the mainstream methods; and practical values this study has for those involved and those who want to be helpful in the process. Finally, the limitations and suggestions for future directions are presented.

### **5.1. Summary of the Findings**

The questions asked in this study were the same as those addressed by most acculturation research: how people acculturate, how well they adjust, and what the relationship is between the way of acculturation and its outcome. But these were framed for a particular multicultural student community. It is believed that social network analysis is able to capture more relational nuances when the mainstream host culture is hard to define and the number of cultures involved is more than two, as are the conditions in this research.

The East-West Center community analyzed in this study is famous for its cultural diversity in composition as it hosts about 300 international and American graduate students annually. It sponsors and also requires all participants to live on campus, even those from Hawai'i or from the mainland America. Its unique location in Hawai'i and long-term tradition as a multicultural educational site make it questionable to operationalize the host culture orientation simply as the mainstream American culture. In addition, the dynamics between cultures were not just about host and heritage cultures but also between heritage and heritage cultures given the diversity of this community. The challenges that these facts present to the bi-dimensional framework motivated the use of the SNA/ network perspectives in data collection, data analysis, and theorizing. In a nutshell, the constructs used in the quadratic model (i.e., integration, assimilation, separation, and marginalization) provided the necessary link between the current

approach and previous studies in the discussion of the acculturation phenomenon. However, their meanings were reconstructed in the multicultural setting and with the help of a network approach. How this was achieved is explained below.

The boundary of the full-network analyzed in this study was set by the official EWC 2012-2013 directory. It contains 280 currently affiliated participants from over 30 countries. The names and pictures were used in the online survey as the pool for respondents to select their socializing partners and close friends from this community. 150 on the list actually responded to the survey and their data were used to populate all the networks later for analysis. Twenty-seven semi-structured interviews were conducted as a follow up to include the perceptions from the insiders and to cross-check the results from the social network analysis.

The first question (how people acculturate) was answered by characterizing the community networks and the sub-networks within it as is defined culturally and structurally. The findings show that people in this community socialized widely with their peers in the EWC. The existence of cultural diversity did not lead to separated components in the socializing networks. On the contrary, the social network demonstrated structural features of a cohesive community. Even though 130 out of 280 did not respond to the survey, the nodes in the network are still all connected into one component. The reciprocate rate (i.e. dyadic agreement) regarding socializing partner selections is above fifty percent. There is also relatively high transitivity observed, which suggests that this is a tightly connected community in which one's friends tend to be friends, too. The close friend network is relatively sparse given that each person can only nominate up to six for this relation. Even so, 80% of the nodes are connected in the major component. The relations represented in the CLOSE network are stronger compared to the socializing relation and are used for further analysis of cultural groups and structural clusters.

How people from the same cultures form their friendship circles and what types of subgroups existed in the community were analyzed based on Simmelian/Embedded tie graph. Connected pairs in this graph are close friends who share a number of common friends. It was found that different cultural groups demonstrated different acculturation patterns and they were not naturally homogeneous. All types of acculturation modes

described in the quadratic model were observed in the network, but with more variations and nuances at both individual and group levels. Integration covered a wide range of behavioral patterns from culturally specific to culturally general mixing and at both individual and group levels. Assimilation is hard to define following the bi-dimensional model as no obvious dominant culture prevails in this multicultural setting. However, it can be defined in the networks as the embeddedness of a node into the hosting community, which allows the transcending of national cultures by community cultures. Separation exists for some cultural groups in the form of ethnic enclaves identified through structural clustering. Isolates and pendants in the networks were socially not so much engaged or identified with the community, so their acculturation pattern is the most similar to the marginalization mode. What's more, the network analysis also suggests that the group level patterns are not necessarily the sum or average of the individual patterns because of the unique connections to the rest of the community that each individual brought in. In other words, there are individuals who are bridging cultures in a relatively exclusive co-national group. There are also groups that are fairly embedded as the core in the network with dense social connections internally and externally.

The cultural homophily effects in this network were minimal, although it is slightly more observable in the close friend network than the socializing one. In other words, nationality-based cultural similarity matters more in close friendship than in socializing. Beside cultural homophily, the other common mechanism for tie formation—proximity—was also checked, as well as its combined effects with homophily. Although both were identified as statistically significant factors for explaining the formation of social ties, the variance explained is trivial. This network differs from other human social networks, in which cultural homophily and geographical proximity are often important predictors for social relations (Monge & Contractor, 2003: 223-240). There are two possible explanations for the not so obvious homophily effects. One possibility is that this community did such a great job of integrating people of different genders and from various cultural regions and nations because the participants go beyond superficial similarities while making friends. The other reason is that some participants' cultural affiliation was not well aligned with their nationality (e.g. multi-racial people or minority groups from a big country), so the actual homophily factors that led to the formation of

ties were not measured. For example, Indians from Malaysia or Tibetans from mainland China might feel more culturally similar to participants from India rather than other ethnic groups from their countries of origin. As for the proximity mechanism, the walking distance between the two dorm buildings and the frequency of community events might have reduced its effects.

So from the network perspective, this is a socially cohesive and culturally integrated community. But at group and individual levels, there are variations and nuances in relational patterns, which could not be fully accounted or appreciated by the four-fold model due to its typological nature.

With regard to the outcomes of acculturation, individual scores on socio-cultural adaptation, life satisfaction, and academic performance all showed skewed distributions towards the highest end. In other words, they adapted well in general. This was supported by the interviewees as most of them spoke highly of their life at the Center. Some did mention occasional difficulty and issues related to dorm life, graduate study, and interpersonal relations, but with great intercultural sensitivity and understanding.

The findings about the last question of relationship between acculturation and adaptation were not surprising. According to the “integration hypothesis”, when the policy, the acculturating individuals, and the host all support double cultural engagement, people adapt more successfully (Berry & Sam, 2013). Given the demonstrated integration level at the community social networks, the overall good adaptation in all aspects are understandable. Without a counterpart community (i.e., similar in composition but differ in cohesion) from which a full social network is available, no statistical test could be done at this level for comparison, but the relationship was tested using eigenvector centrality as a structural variable at the individual level. The results showed that the number of people one is connected to as well as the connectivity of one’s neighbors accounted for about half of variance in one’s adaptation in both domains.

## **5.2. Interpretation of the Findings**

After summarizing the findings, the next question in line is whether the implementation of full-network analysis in this case study is valid and successful. In other words, how are the findings related to other research in this field?

First of all, the characteristics of the social networks of this community may not be common in typical social situations, but it did show what could be achieved in the right place and with the right people. In other words, this research is like a natural experiment testing the theories about intercultural relations in a carefully provided socio-cultural context.

Allport (1954) proposed the “intergroup contact theory”, which predicts that people who have positive contact experiences with other cultural groups are generally less prejudiced or more tolerant towards those cultures. Pettigrew, Tropp, Wagner, and Christ’s (2011) meta-analysis of 515 studies showed general support for this theory and that the optimal conditions, if satisfied, could significantly reduce prejudice against out-group members. Moreover, the favorable feelings and attitudes do not just apply to those who are in actual contact but also extend to the rest of people from the same cultures.

The formation of such culturally heterogeneous social networks in this particular socio-cultural context provides clear evidence supporting the intergroup contact theory. The network structure and interviewees’ accounts both showed that the participants at the EWC had many opportunities to interact with each other, did so, and established some very close friendship across cultural boundaries. This explained why cultural diversity was hailed and prevailed in this community rather than cultural assimilation or segregation. It highlighted especially the crucial role played by intimate friendship in fostering cross-cultural understanding and tolerance as one of the major contributing factors singled out in the meta-analysis of Pettigrew’s team (2011). The world-wide reputation of the Center and its far-reaching alumni network is another sign of the long-term effects of the positive intercultural contacts. Actually, a comment from a current student at the East-West Center 2020 Participant Vision event illustrated this point vividly:

*“Cultures are personified; and not the way generalizations are often projected by the media. You then go back and explain to your friends. You start being attentive to news about other cultures because you know somebody. (EWC Participants, et al., 2013: 9)”*

Such “personification” of other cultures helped the participants resist oversimplified views of other cultures as homogeneous and be more sensitive.

Experiments have shown that one's acceptance of cultural diversity is dependent on their feelings towards other cultures and whether they perceive those cultures as homogeneous or not (Florack, Bless, & Piontkowski, 2003). The many cultures present in this community provide the participants an opportunity to see the varieties through their interpersonal relationship with people from different cultures. Thus, it is not surprising that the often found cultural homophily effects were not salient in this community in general. Instead, cultural heterosity was observed commonly in both the social and close friend network maps and at both group and interpersonal levels.

Arends-Toth and Van de Vijver's (2007) study found that in the public domain, both heritage and host cultures were equally favored, but the heritage one was favored more in the private domain. This is also the case in this study. There is slightly stronger effect of cultural homophily in the CLOSE network than that found in the SOCIAL network, as the former is more intimate and private than the latter.

Secondly, with regard to the impacts of the networks on acculturation outcomes, the results corroborated the influence of "integration mode", "social support", and "social cohesions" on cross-cultural adaptation.

The "integration hypothesis" states that those who choose to embrace their own and other cultures adjust the best in acculturation (Berry, 1997, 2003). Nugyen and Benet-Martínez's (2013) meta-analysis has provided the most comprehensive evidence for it in bi-cultural situations. Overall, findings from this study are in agreement with the theory, but extended it at the same time with more richness. When the socio-cultural contexts are multicultural, in most other studies the effects of the ethnic composition were not accounted for in the operationalization of the construct. With the help of network approach, integration was observed at the community, group, and individual levels with relation to the acculturation patterns. Thus, it provided a valuable map of the overall image of integration in the community of focus. It is not just about the host versus those from other cultures, but about all the groups and individuals who actually interacted and became friends with. The study done by Rosenthal, Russell, and Thomson (2007: 71) finds that "students from Asian countries reveal different patterns to other students, especially in the relationships between connectedness and interactions with co-culturals". Such differences within and between the types laid out in the bi-dimensional model are

captured well in the network representation. In addition, the influence of ethnic composition of the acculturation context on its outcomes is in line with one of Smith's (1999: 647) propositions that "[as] socio-structural heterogeneity increases, the probability of acculturation increases."

Studies on social support already suggested that one's social networks could offer both psychologically buffering effects and provide access to social resources in times of difficulty (Back, Schmukle, & Egloff, 2008; Cohen & Wills, 1985; Hayes, 1994; Lee, Koeske, & Sales, 2004; Neri & Ville, 2008). Scholars of acculturation also started to pay attention to interpersonal adjustment (Ryder, Alden, Paulhus, & Dere, 2013) as another dimension of adaptation. Since an acculturation social network is based on interpersonal relations, it is easy to see how network structure can serve as a common measure between the two constructs. The result from this study did suggest that the social networks formed through socialization and friendship enabled various kinds of social support (e.g., material, spiritual, and emotional) that are instrumental. In other words, the participants in this community enjoyed a rich network of resources, which helped their acculturation experiences and smoothed their adaptation. Jurcik, Ahmed, Yakobov, Solopieieva-Jurcikova, and Ryder's (2013) study highlighted the importance and the moderated effects of ethnic density in the neighborhood on psychological adaptation. Similarly, this case study also demonstrated the varied impacts of ethnic student associations on the group's acculturation patterns and outcomes.

Social cohesion is another relevant construct for researching about acculturation outcomes. Ward, Leong, and Berry (2009) pointed out in their chapter for the book *Intercultural relations in Asia: Migration and work effectiveness*, that although in general, New Zealanders welcome multiculturalism, their attitudes towards Asian immigrants are less favorable compared to people from other cultural regions, such as the Middle East, and Pacific Islands. The social network maps in this case study showed a similar pattern that cultural groups in the same community did not acculturate the same way with the host nationals. Moreover, the study also showed each cultural group's relation with all the others side by side, which provided an inclusive scope to view acculturation experiences in its immediate context. In other words, relations with the host nationals are the most important question to explore, but when the ethnic composition of a

neighborhood goes from bicultural to multicultural, there are more interactions besides those between each cultural group and the host nationals that are worth investigating.

In conclusion, the formation of culturally well-mixed community social networks and their positive impacts on facilitating acculturation found in this case study are in congruence with the theories and empirical evidence found in previous research. But it also enriched the academic understanding of the phenomenon by presenting relational patterns unique to the socio-cultural contexts in question. The next section further explains its theoretical and practical implications.

### **5.3. Contributions and Implications**

The research literature about acculturation and its impacts has been accumulating for years, and many constructs (e.g., acculturation stress, intercultural friendship, cultural shock, social cohesion, social support, etc.) have been carefully and thoroughly investigated. What this study contributes to academia is to illustrate, side by side, the effects of and interactions among variables about individuals, social relations, and physical surroundings in the context of acculturation. It also reminds us, as researchers, of an important fact that the phenomenon we are studying is more complex and dynamic than most study designs can or intend to take into consideration. What this study, its approach, and its findings mean to the theorization and practices in this field are discussed in the following sub-sections.

#### **5.3.1. Theoretical and Methodological Contributions**

In general, acculturation theory deals mainly with bi-cultural situations, although both by definition or in practice, multicultural contexts are common, they are often treated the same way. The issues in measuring integration have been widely discussed in several articles (Boski, 2008; Rudmin & Ahmadzadeh, 2001; Ward & Rana-Deuba, 1999), but fewer alternatives were offered. The major debates are about the psychometric issues of the instruments (Rudmin & Ahmadzadeh, 2001, Rudmin, 2003, 2008), the ideological bias of integration (Boski, 2008; Rudmin, 2003, 2008), and the cutting point for categorizing the acculturation behavior according to the four types in the model

(Ward & Rana-Deuba, 1999). The success of applying full-network analysis in this study might be a solution methodologically. As a result of the changes brought by SNA to measurement and unit of analysis, theorizing of acculturation could take another direction as well.

Acculturation takes place whenever one moves to a new place. The operationalization of the two dimensions or four orientations requires specification of the two cultures. Whether the representations of the heritage and host cultures are legitimate and whether mutual opinions are considered are constantly challenged and debated. Moreover, many applications of Berry's model keep contextual variables out of the picture. It is hard to address the critiques on such issues within the bi-dimensional framework. This full-network study opened another door to bypass these methodological hurdles and catch up with the changes witnessed in common acculturation contexts (e.g., multicultural residential integration and decreasing racial segregation in metropolitan areas).

In the tradition of SNA, social network structure can play the roles of both cause and effect when explaining a phenomenon. Findings from this study suggest that the networks built at the Center served as both the means and end for its participants' acculturation. For example, some participants entered the community through prior contacts with alumni or some old timers. Through these people, they became part of the existing social networks of the community. As they acculturated gradually, they themselves developed more social relations, which in turn shaped the community's network structure. Clearly, adding the network perspective to theorizing on acculturation is possible and beneficial. Taking a network perspective to theorize about acculturation was proposed by Smith in 1999 and the lessons learned and findings from this study could help take the step further.

Findings from this study show that full-network analysis can capture well the ethnic composition and the relational patterns of the community, in which acculturation takes place. This is important for advancing the theorizing on acculturation to accommodate more the complex and culturally mixed reality. Accordingly, the proposed theory is that the acculturation process and outcomes are affected by the cohesion and cultural composition of the receiving community's social networks. The results of this

study suggest two propositions that can be developed from this proposed theory: (1) The difficulty for acculturation is positively related to the degree of cultural homogeneity of the hosting community; (2) The difficulty for acculturation is positively related to the degree of the network cohesion of the hosting community. The cohesion and cultural composition of the community's network are the two dimensions to measure acculturation environment. In this way, the socio-cultural context is no longer left out of the picture empirically.

In a recent special issue on multiculturalism of European Psychologist, Berry and Sam (2013) defined multiculturalism in their editorial as the “joint value placed on cultural maintenance (the cultural diversity element) and equitable participation (the intercultural element)” (p. 154). It is not hard to see that the two factors outlined in this definition actually correspond to the two constructs in this proposed theory derived from network analysis. Moreover, SNA makes it possible to visualize both at the same time. The cultural diversity can be revealed by the demographics (as nodal attributes) and the intercultural interactions by the presence or absence of network connections.

A well-connected multicultural community comes close to what the best “integration” strategy might look like at the group level. This study also reveals that those living in such a community did score high on both socio-cultural and psychological adaptation scales. This is what the theory proposes, and if supported in future research would be in agreement with the empirical findings in the literature. Moreover, it has the potential to address the debates going on in the field. Under this proposed framework, conflicting results from previous studies might be explained. For example, studies have shown that assimilation and separation strategies sometimes have stronger correlations with positive acculturation outcomes (Rudmin, 2008; Ward & Rana-Deuba, 1999). These variations could be the result of the un-measured social context where the acculturation occurred. The proposed theory could deal with this third variable: the network structure of the hosting community.

In addition, the proposed theory also allows for an alternative network measure of adaptation in addition to the existing scales. Ward & Rana-Deuba (1999: 424) pointed out that “the greatest adjustment difficulties occur at point of entry in both cases; however, sociocultural problems steadily decrease and gradually level off, whereas psychological

distress is more variable over time.” This implies that the commonly used measures of socio-cultural adaptation might not be sensitive enough after a certain time period and measures of psychological well-being confound with more time-related personal issues beyond acculturation. But, the network adaptation measures are capable of indicating what resources are potentially available when migrants or sojourners encounter difficulties or need mental comfort. Keeping track of longitudinal changes in social networks (also known as dynamic network analysis) can reveal how social ties are used for realizing the network resources. So, it is worth developing acculturation network measures as indicators of both the process and outcomes of acculturation.

Methodologically speaking, the full-network approach demonstrates that individual nodes, dyads, triads, and clusters are all organic parts of a network and their effects on acculturation (for which network structure is a proxy) do not aggregate by simple addition. This study argues that understanding acculturation in a culturally diverse context requires approaches that go beyond the host-heritage pairs to accommodate all cultures involved at all levels. The full network analysis has every individual in the community represented as a node in it, so the visualization shows actual connections between all. Such a sociogram enables us to see how the predefined groups relate to each other, not just pairwise, but in the full complexity of their mixing and non-mixing with all the other groups. The cluster analysis helps identify empirically cohesive groups within the community, which can be analyzed side by side with attribute-based groups. Interviews in which the sociograms are shown elicit rich information from participants concerning emic views of how actor characteristics and relationships explain the observed network associations.

Identifying structural groups with a clustering algorithm and comparing them with groups defined by nationality is a method with promise for research on cultures in general. When the two ways of grouping are laid out on the same network graph, the visualization itself can show clearly to what extent the structural clusters and the cultural groups overlap. This is desirable and necessary if researchers do not want to treat cultures simplistically and are interested in the nuances revealed at different levels of analysis. For acculturation research in particular, contrasting groups defined by interpersonal relations with groups defined by individual attributes (e.g., nationality, ethnicity, religion, etc.)

shows clearly why the typological approach (i.e., bi-dimensional model) can be problematic. It also provides an alternative way to operationalize acculturation orientations that does not need to be culture specific nor force an arbitrary dividing point for categorization.

### **5.3.2. Contributions to Practice**

Chirkov, the editor of the special issue of the International Journal of Intercultural Relations (IJIR) on critical acculturation, once lamented,

*“Modern acculturation psychology has become almost useless for the immigrant communities and for the immigrant-assisting organizations as its conceptual framings, universalistically oriented empirical studies, produced knowledge that was not applicable to any particular immigrant community in different countries.... To the best of my knowledge, acculturation psychologists have been incapable of making their discoveries applicable to real-life situations of cultural transitions.” (Chirkov, 2009b: 89)*

This section is dedicated to the practical implications of this research with the hope of connecting acculturation research back to reality.

One of the most important findings as well as the initial motivation for conducting this study is to find out what makes a multicultural community work and conducive to the ferment of long-term intercultural friendship. Learning from mistakes and failure is one way and learning from success and glory is another. The literature of intercultural communication has been disproportionally focused on the former and not enough on the latter. It is hoped that this study about the successful formation of cohesive multicultural networks at the EWC will provide insights and shed light on how to achieve similar goals in other places and with similar organizations in the future.

The EWC community has long been hailed for its ambition and success of bringing cultures together. The data collected for this study indeed quantified how well integrated the participants are regardless of their different cultural origins. The high-level cohesion characterized this community, which explains why it continuously carries on the same spirit for generations and why the alumni all over the world still identify strongly

with this place, their cohort, and the mission of the EWC. Creating a cohesive community that fosters intercultural understanding and life-long friendship is something that many organizations and educational institutions are committed to achieve. So the successful case described in this study provides a valuable model for reference. Mixed cultural demographics do not necessarily guarantee good intercultural integration (Halualani, 2008; Halualani, Chitgopekar, Morrison, & Dodge, 2004), so it is worth knowing what else helps achieve the goal. Nate Silver (2009 April), a famous statistician, optimistically suggested at his TED talk that if people have more chance to live in a diverse neighborhood, race might not be such a predictor in polls in the future. This is exactly why building cohesive multicultural communities is important and should be pursued.

The findings also indicate that the architecture design, the housing arrangement, the institution-organized activities, the staff members, and the participants themselves all play a part in this whole picture. This community is not only cohesive, but also sustainable and resilient to changes. It does not depend on a few: when some left, the community itself and its characteristics are still there. There are certainly lessons to be learned, flaws to be mended, unsatisfied parts to be improved, but overall, knowing that it can be and has been done successfully in the past 60 years at the EWC is itself a motivation to keep such an endeavor going.

There are many international student houses and multicultural student services offices in the United States and other countries. Their particular socio-cultural contexts could differ from this one in terms of the demographic composition, geographic location, facility, staff, and history, so what has been learned from this study might not be applicable literally in all circumstances. However, the point that this study made about taking a relational perspective and bringing it to the awareness of the participants is still applicable. Durland's (2005) application of network analysis in formative evaluation after two departments were integrated in an organization is such an example of how methods of network research could be used to inform decisions in real life situations. Likewise, the results of this study could help identify the cultural mixing patterns of the current participants at different time points (e.g., orientations, community building activities, or seminars). In this way the community leaders could make directed efforts to help connect or bridge and participants could discuss about their reasons and outcomes of

taking specific acculturation strategies. A longitudinal track of the changes in the community network could also be used to consult strategies for community building, intervention program, and leadership cultivation.

The data collection itself could also benefit the community. One respondent told the researcher after taking the survey that he appreciated the picture-design very much and was eager to know the final result. He said that because the names of many participants were foreign (i.e., hard to spell or remember), he actually took this opportunity to familiarize himself with the official names of those he often socialized with. Another respondent became conscious of his more homogeneous social circles after making the selections and said that he did not realize it before and wanted to expand his network more.

The ego-network maps were shared in the interview. Some commented on the usefulness of being able to see the visualization of the culture mix in their social networks. This is an effort to contribute back to the community that was being studied. A few interviewees were excited to see that their goal of being a cultural ambassador and intercultural bridges was clearly demonstrated in their ego-networks. Afterwards, they said they felt more motivated to continue such efforts. Some reflected on the lack of connection to certain cultural groups and expressed their intention to take the initiative to make friends with people from those regions.

The difference between the individual and group level acculturation patterns has important implications for the design and implementation of intercultural intervention or training programs. As shown in the network representations, individuals could contribute to the group's acculturation experience by bringing in different social connections. This means that strategic targeting could be more effective for cultivating better intercultural relations.

#### **5.4. Limitations**

As all social science research has to face, this study has limitations that confine the interpretation of its findings and generalization of the conclusions. There are several limitations pertaining to the design of the study and the nature of network data collection. First of all, the name list includes everyone who is currently on a scholarship or

certificate program at the EWC despite whether the person is physically on the island or not. Although name lists of those who graduated in the middle of the research process as well as short-term participants were obtained, they were not 100% accurate. Some of them did stay longer and still lived in the community. So, the exact number of the absent participants could not be determined and were not taken out of the networks. Relatedly, there were no individual attribute data available for the 45% non-respondents, such as their adaptation scores and their residential locations. So conclusions drawn from this study might not be applicable to those non-respondents. Also, it should be kept in mind that those who responded were generally more sociable than those who did not. So the network was biased towards representing the more gregarious people.

Secondly, the network is constructed with the boundary pre-defined (as current participants of the EWC community). Although most participants live in the residential buildings and attend regular events organized by the EWC, there are chances that their major social networks are not centered on the EWC community. Respondents were allowed to nominate people outside of this community, but what impacts of those outside relations on their social relations within the community as well as their adaptation cannot be measured within the bounded networks. Similarly, there are 32 respondents whose data were not used in the analysis because they are not on the name list for drawing the network boundaries. The researcher has no way to collect their personal information, which for those on the directory was publicly available.

Thirdly, social network surveys often fatigue respondents due to the tedious and repetitious items needed to fill out the questionnaires, the paramount goal for ensuring high response rate is to ease their burden. Although it would nice to include identity and attitude measures of acculturation orientations of the participants to compare with the network measures and previous studies, such scales were not included to significantly shorten the time used for the survey.

Lastly, the unique setting of the EWC makes it a valuable testing field for complete network study of a multicultural community, but also limits its applicability to situations that are very different. However, as stated before, this study's goal is to see (1) whether a complete network approach can help acculturation researchers frame the phenomenon we study in a more neutral way and (2) whether the combination of

structure and attribute factors under an alternative paradigm elicit new insights about how people adapt in a multicultural context. Unlike standard statistical methodology, the generalizability of network sampling is hard to assess because random sampling is impossible. Actually, in this study, the EWC community could literally be considered as a population by itself, and generalization is not actively sought for statistical inference purpose. However, as Rothenberg (1995) pointed out, cautious assumptions about generalizability could be made by comparing the general social demographic characteristics of the samples obtained from ethnographic investigation.

## **5.5. Future Research Directions**

Future research of the same community could take several directions based on the current one. To begin with, only self-reported survey and interview data were collected for this study. Future researchers could take advantage of field observation at the same time and collect behavioral data to triangulate the methods and compare the results from different data sources. A longitudinal research plan would also be an invaluable extension of the current one. If the network relational data of this community could be collected at different intervals, the researchers would be able to capture both the process and the outcomes of acculturation in network terms. This is possible and desirable given the Center's already developed large international networks of alumni and collaboration partners. It provides a way to quantify the effects of the impacts of the EWC experience in the long run.

Secondly, more studies should be conducted in other multicultural communities as well to see how the ethnic composition and the existence of student associations in the receiving community, which appear to be two major influential factors in acculturation, affect the formation of intercultural relations as the environment changes. For example, do the Chinese and Japanese international students have relatively less cohesive groups in multicultural communities? Do the Vietnamese become less shy or more inclusive if the hosting country is in Asia or France? Do people from the Pacific region still tend to be bonded together by music and other cultural events if they acculturate in places when the climate and environment are very different from tropical islands? Do Indonesians and

Okinawans associations consistently function as a platform for ethnic cultural demonstration? Besides studying systematically a wide range of hosting communities and acculturating groups, researchers can also diversify the approaches by looking into different types and numbers of relations (i.e. negative tie and multiplicity) that might affect the acculturation experience and outcomes. For example, it is well understood in the literature that a cohesive and tightly-knit social network structure brings benefits to individuals such as social support, trust, and information on the one hand; while on the other hand, exert constraints such as social pressure and redundancy as well (Latora, Nicosia, and Panzarasa, 2013). This paper has focused mainly on the positive side of a well-connected multicultural community and does not discuss much on its possible negative effects. However, the interviews with the participants did reveal some confining effects of such a network on handling internal conflicts. Future research could look into negative relations or confining effects of networks on acculturation as well.

Thirdly, the ability to incorporate multi-level variables, especially those regarding the receiving community, is a welcoming step as a response to the calls for change in paradigm. Chirkov called for this:

*“Let me suggest to take a step back in our research and ask questions about what integration means for different groups of immigrants in different societies (Boski, 2008), how they experience it and how integration unfolds in various specific contexts. And after a rigorous description of integration together with assimilation, separation, marginalization and other ‘acculturation strategies’, we may return to the bi-dimensional model with a clearer understanding of what does [sic] these strategies mean and how they are used by different groups of immigrants in various settings.” (Chirkov, 2009a: 101)*

It points to the direction of conducting action research in the community and for the community. This study already demonstrated that the social networks of the community are instrumental in the process of acculturation. So, it makes sense to pursue action research that can bring acculturation research back to the ground and be useful for those involved. Possible study designs that monitor changes of social interactions and relations in the community may help identify key players and grouping patterns in the

community. It can also shed light on whether an intervention or training programs is needed and how they can be effectively implemented. If such efforts are taken with different types of communities that are systematically sampled and with data collected on their full-network, more will benefit from the general knowledge obtained from such studies.

Lastly, the use of networks in research about psychological acculturation provides a connecting bridge between disciplines. As mentioned earlier, constructs based on network analysis have already been the core indicators in studies on social capital, social support, and social cohesion in the fields of anthropology, organizational communication, social work and civic movement, and political science. Today's socio-technical contexts, in which acculturation takes place, are also worth investigating to understand the function of both offline and online social relations in this process. In addition, the patterns and outcomes of acculturation documented in such research can further inform political scientists, professionals in urban planning and population areas, and researchers on educational and social work so as to benefit both the acculturating people and the receiving societies.

# Appendix A: Online Survey

## EWC Social Network Survey (2013)

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### Consent Form

#### University of Hawai'i

#### Consent to Participate in Research Project

##### *Social Network Mapping of the East-West Center (EWC) Student Community*

My name is Ruobing Chi. I am a graduate student at the University of Hawai'i at Mānoa (UH) in the Interdisciplinary Ph.D. Program of Communication and Information Sciences (CIS). This research project is being conducted as part of my degree program. The purpose of this study is to investigate what factors account for the socializing patterns in a multicultural environment. I am asking you to participate in this project because you are a member of the East-West Center student community.

**Project Description - Activities and Time Commitment:** Your participation consists of filling out a 15-minute online survey. In order to map out who interacts with whom in this community and match answers from all questionnaires, you will be asked to provide your name and names of those whom you interact with. But once data are collected, they will be anonymized by replacing names with random ID codes. No personal identity will be revealed in the analysis or reports of the results.

**Benefits and Risks:** There are no direct benefits to individuals in participating in my research project. However, its results might help me and other researchers learn more about what facilitate better intercultural socialization. There is little or no risk in participating in this project, either. If, however, you feel uncomfortable after submitting the survey, you can contact me to remove your data entirely from the study.

**Confidentiality and Privacy:** Due to the nature of social network research (as specified in the sections above), data collection cannot be anonymous. But your answers to the survey questions will be kept in a password-protected format to which only I have access. In the case of reporting the results, no individual names or identifiable personal information will be revealed. Photo IDs used in the survey are public data from the EWC 2012-2013 directory.

**Voluntary Participation:** Participation in this research project is voluntary. You can choose freely to participate or not. In addition, at any point during this project, you can withdraw your permission without any penalty of loss of benefits.

**Questions:** If you have any questions about this project, please contact me via phone (808) 436-7590 or e-mail (ruobing@hawaii.edu). If you have any questions about your rights as a research participant, in this project, you can contact the University of Hawai'i, Human Studies Program, by phone at (808) 956-5007 or by e-mail at uhirb@hawaii.edu.

**To Access the Survey:** As an indication of your understanding and acceptance of this information, please enter your email address below. Your email address is for validation of your consent only and will not be used for any other reasons.

Please print a copy of this page for your reference.

**Your Email Address (for validation only)\***

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**Required Questions are marked by \*.**

**1) How long have you been in Hawai'i? (e.g. 3 months)\***

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**2) What's your NATIVE language? (If more than one, please list them all)\***

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**3) What OTHER languages you have learned or are learning (EXCEPT English and your native language)?**

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**4) Your year of birth is**

1950 to 1995 (Dropdown list)

**5) Where have you been living for most of the time you are here?\***

Hale Mānoa 3rd Floor

Hale Kuahine 2nd Floor

Hale Mānoa 6th Floor

Hale Kuahine 3rd Floor

Hale Mānoa 9th Floor

Hale Kuahine 4th Floor

Hale Mānoa 12th Floor

Off Campus

*[If Hale Mānoa options in Q5 are selected]* On which side is your kitchen?

Diamond Head

Ewa

**6) Are you in a relationship?**

No.

Yes, and my partner is here with me.

Yes, but my partner is NOT here with me.

**7) Are you a parent?**

No

Yes

**8) Ethnically, you consider yourself as**

(please check all that apply)

Asian

Native Hawaiian

American Indian/Alaska Native

Pacific Islander

African American

White

Hispanic or Latino

Other: \_\_\_\_\_

*[if the first option of Q18 is selected]* Asian as

(please check all that apply)

Chinese

Korean

Filipino

Vietnamese

Indian

Other: \_\_\_\_\_

Japanese

**9) In which religious tradition did your parents raise you?**

Not applicable

Jewish

Buddhist

Muslim

Christian

Other: \_\_\_\_\_

Hindu

**10) Which religion are you currently practicing (if any)?**

- Not applicable  Jewish  
 Buddhist  Muslim  
 Christian  Other: \_\_\_\_\_  
 Hindu

**11) Check all options that apply if they properly represent your identities:**

- a foreigner  a newcomer to the EWC  
 a local  a cultural ambassador (representative)  
 a parent of my home country  
 an old-timer at the EWC  a religious person  
 other (please specify) \_\_\_\_\_

**12) Do you have account(s) at social media sites such as Facebook, Orkut, QZone, Weibo, Mixi, CyWorld, Wretch, Zing, Google+, etc.?\***

- No.  Yes.

**Regarding your social media use:**

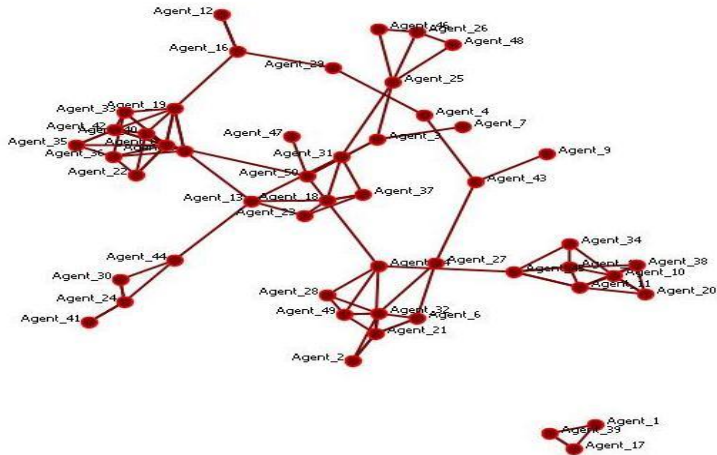
Which site(s) have you USED in the past 7 days?: \_\_\_\_\_

What did you DO when you logged on the site(s)?: \_\_\_\_\_

**13) Your GPA range is**

- 4.0 - 3.8  3.1 - 2.9  
 3.7 - 3.5  2.8 - 2.6  
 3.4 - 3.2  2.5 or lower

**A social network graph (see illustration below) can reveal how people are connected and clustered. It provides valuable insights for studies such as cultural integration, social support, and information diffusion.**



**In such a graph, a node represents a person and a tie indicates a connection. But no personally identifiable information will ever appear in any analyses or reports based on this survey.**

**14) What's your name?\***

*Names of all respondents are needed so as to match nominated connections by other respondents to the right person, but your responses are COMPLETELY CONFIDENTIAL. All names will be dropped and assigned random ID numbers after processing the data match.*

Family Name (Last Name): \_\_\_\_\_

Given Name (First Name): \_\_\_\_\_

**15) Other Name(s) that you go by in this community**

\_\_\_\_\_

**16) What are the ways that you socialize with people here?**

*Please select all occasions that apply*

- Going out (e.g. dinners, movies, pubs, games, etc.)
- Attending EWCPA organized events (e.g. International Potluck, Concert at the Lawn, East West Fest, etc.)
- Gatherings, parties, potlucks, and cooking
- Working out and sports (e.g. jogging, yoga, badminton, volleyball, swimming, surfing, etc.)
- Volunteering and community service

Reading and studying

Religious practice (e.g. going to church, praying etc.)

Other \_\_\_\_\_

**In the following questions, each person is represented by a photo (obtained from the 2012 EWC participant directory). Please CLICK ON ALL whom you have SOCIALIZED with (i.e. on occasions you have just selected) HERE in Hawai‘i.**

**Note: You do NOT need to click on your own photo.**

[Images are not included here for the following questions 17-22, but are available in the online version].

**17) Participants from Southeast Asia** (including Brunei, Burma, Cambodia, Indonesia, Lao, Malaysia, Philippines, Singapore, Thailand, Timor-Lest, Vietnam)

**18) Participants from East Asia** (including China Mainland, Taiwan, Hong Kong, Macau, Japan, Korea, Mongolia, Russia)

**19) Participants from South Asia** (including Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka)

**20) Participants from Pacific Region** (including Australia, American Samoa, Cook Islands, Fiji, New Zealand, PNG, Samoa, Tonga, Tuvalu, Vanuatu, etc.)

**21) Participants from the United States** (including Hawai‘i)

**22) Participants from Other than Asia-Pacific or US** (including Armenia, Brazil, Cameron, Canada, Germany, Italy, Kenya, Netherlands, Nigeria, Serbia, Tanzania, etc.)

**23) Missing pictures of someone you often SOCIALIZE with HERE? Just type their names below.**

- 1: \_\_\_\_\_
- 2: \_\_\_\_\_
- 3: \_\_\_\_\_
- 4: \_\_\_\_\_
- 5: \_\_\_\_\_
- 6: \_\_\_\_\_

**24) Please NAME up to 6 friends (from those you just selected) by CLOSENESS to you (from the most to the least).**

\*CLOSENESS here is defined as the extent that you feel comfortable to share your personal thoughts and feelings with that person.\*

*When you start typing, suggested completions will be provided, but you can type in names that are not in the list.*

The Closest Friend: \_\_\_\_\_

2nd Closest Friend: \_\_\_\_\_

3rd Closest Friend: \_\_\_\_\_

4th Closest Friend: \_\_\_\_\_

5th Closest Friend: \_\_\_\_\_

6th Closest Friend: \_\_\_\_\_

Comments:

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**25) Please rate how much difficulty you feel about the following situations while you are in Hawai'i.\***

	<b>No difficulty</b>	<b>Slight difficulty</b>	<b>Moderate difficulty</b>	<b>Great difficulty</b>	<b>Extreme difficulty</b>	<b>Not applicable</b>
(1) Making friends	( )	( )	( )	( )	( )	( )
(2) Using the public transport system	( )	( )	( )	( )	( )	( )
(3) Making myself understood	( )	( )	( )	( )	( )	( )
(4) Getting used to the pace of life	( )	( )	( )	( )	( )	( )
(5) Going shopping	( )	( )	( )	( )	( )	( )
(6) Going to social events/ gatherings	( )	( )	( )	( )	( )	( )
(7) Worshipping in my usual way	( )	( )	( )	( )	( )	( )
(8) Talking about myself with others	( )	( )	( )	( )	( )	( )
(9) Understanding jokes and humor	( )	( )	( )	( )	( )	( )
(10) Dealing with someone who is unpleasant	( )	( )	( )	( )	( )	( )
(11) Communicating with people of a different ethnic group	( )	( )	( )	( )	( )	( )
(12) Understanding Hawaiian local words and expressions	( )	( )	( )	( )	( )	( )
(13) Living away from family members	( )	( )	( )	( )	( )	( )
(14) Understanding what is required of me at university	( )	( )	( )	( )	( )	( )
(15) Coping with academic work	( )	( )	( )	( )	( )	( )
(16) Dealing with administrative staff at the university	( )	( )	( )	( )	( )	( )
(17) Expressing my ideas in class	( )	( )	( )	( )	( )	( )

**26) Below is a list of the ways you might have felt or behaved recently. Please indicate HOW OFTEN in the PAST WEEK you felt this way by checking the appropriate box.\***

	<b>0 Never</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6 Nearly all of the time</b>
(1) Given my current physical condition, I am satisfied with what I can do.	( )	( )	( )	( )	( )	( )	( )
(2) I have confidence in my ability to sustain important relationships.	( )	( )	( )	( )	( )	( )	( )
(3) I feel hopeful about my future.	( )	( )	( )	( )	( )	( )	( )
(4) I am often interested and excited about things in my life.	( )	( )	( )	( )	( )	( )	( )
(5) I am able to have fun.	( )	( )	( )	( )	( )	( )	( )
(6) I am generally satisfied with my psychological health.	( )	( )	( )	( )	( )	( )	( )
(7) I am able to forgive myself for my failures.	( )	( )	( )	( )	( )	( )	( )
(8) My life is progressing according to my expectations.	( )	( )	( )	( )	( )	( )	( )
(9) I am able to handle conflicts with others.	( )	( )	( )	( )	( )	( )	( )
(10) I have peace of mind.	( )	( )	( )	( )	( )	( )	( )

**Mahalo for taking the survey!**

**If you have any questions, please feel free to contact the researcher by email: [ruobing@hawaii.edu](mailto:ruobing@hawaii.edu)**

## Appendix B: Interview Protocol

### Oral Consent for Participation and Recording

#### Explanation of the Study

Aloha! This interview is part of my dissertation study and I would like to thank you first for participating. I distributed an online survey in early March to the East-West Center participants to which you have kindly responded. The analysis of the results gives me a general idea of the structure of the social relations and the overall cross-cultural adaptation of students here. Now through this interview, I would like to learn more stories beyond those numbers.

#### Semi-Structured Interview Questions

1. **Could you tell me what in the first place brought you to the EWC? What was your expectation of life here before you came?** (focus on previous intercultural experiences)
2. **In retrospect, what do you think of your life here so far?** Do you find living and studying here easier or harder?
  - a. If it is easy: In which sense? What do you think makes it easy?
  - b. If it is hard: In which sense (any challenges)? What do you think makes it hard? How did you (learn to) cope with (adapt to) this?
3. **How did living in this multicultural community affect/change you?** (e.g. ways of living, studying, working, thinking, etc.)
4. There are many different cultural groups in the EWC community. **Which ones do you feel that you are familiar with?** For each of them, could you describe your impression of it?
5. Do you always **socialize with the same group of people or different groups?** [For each group, could you describe the most recent socializing activity or the most common activity that you did with that group? (You don't need to give names of people in each particular group; a descriptive group label/tag will do just fine.)
6. Now, I would like to show and explain you the two network maps of yours within the EWC community from the survey data.

#### INSERT Ego-Networks: [Graph 1: SOCIAL] and [Graph 2: CLOSE]

7. What would you say are particularly **helpful for you to develop social relations with people who are from a different culture?**
8. Is there anything else that I did not ask about during the interview and you would like to share about your life here?

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