Winter 12-15-2014

Childhood Poverty and Psychological Health of Youths in Hong Kong: Mentoring as a Social Capital Intervention

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Childhood Poverty and Psychological Health of Youths in Hong Kong: Mentoring as a Social Capital Intervention

by

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A dissertation presented to the
Graduate School of Arts & Sciences
of Washington University in
partial fulfillment of the
requirements for the degree
of Doctor of Philosophy

December 2014
St. Louis, Missouri

Table of Contents

LIST OF FIGURES ..... **v**
LIST OF TABLES ..... **vi**
ACKNOWLEDGEMENT ..... **vii**
ABSTRACT OF THE DISSERTATION ..... **viii**

Chapter 1. Introduction **1**
1.1 Significance of Problem 2
1.2 Significance of this Study 3
1.3 Specific Aims 4

Chapter 2. Theories and Literature Review **8**
2.1. Aim 1. Operationalize Childhood Poverty 10
2.1.1.Monetary Approach to Childhood Poverty 13
2.2.1. Human Rights-Based Approach 16
2.3.1. Hypothesis 19
2.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty 19
2.2.1 Theory of Developmental Trauma 20
2.2.2. Self-Efficacy Theory 21
2.2.3. Hypotheses 23
2.3 Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty 24
2.3.1. Social Capital Theory 25
2.3.2. Mentoring as a Social Capital Intervention 28
2.3.3. Hypotheses and Research Questions 35

Chapter 3. Research Methodology **37**
3.1 Methods Overview 37
3.2 Program Participants / Study Sample 38
3.2.1. Quantitative Data: Child Development Fund Project 38
3.2.2. Qualitative Study: The School Based Problem Solving Skills Mentoring Program 42

3.3 Data Collection....43
3.3.1. Quantitative Data (Aim 1, Aim 2 and Aim 3)....44
3.3.2. Qualitative Data (Aim 3)....46
3.4. Measurements....48
3.4.1. Aim 1. Operationalize Childhood Poverty in Hong Kong....48
3.4.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty....50
3.4.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty....53
3.5. Data Management....57
3.5.1. Quantitative Data....57
3.5.2. Qualitative Data....63
3.6 Methods of Analysis....64
3.6.1. Aim 1. Operationalize Childhood Poverty in Hong Kong....64
3.6.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty....67
3.6.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty....72

Chapter 4. Results....87
4.1. Aim 1. Operationalize Childhood Poverty in Hong Kong....90
4.1.1. Descriptive Statistics and Model Fit Statistics....90
4.1.2. Classification of Youths into ñLiving in Households Receiving Welfareò versus ñLiving in Households Not Receiving Welfareò....92
4.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty....95
4.2.1. Initial Data Analysis, Exploratory Data Analysis and Model Validation....96
4.2.2. Effects of Childhood Poverty and Financial Difficulty on Psychological Health....97
4.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Povertyé ...101
4.3.1. Quantitative Findings....102
4.3.2. Qualitative Findings....122
4.3.3. Merging the Quantitative and Qualitative data....141
4.3.4. Merged Framework....145

Chapter 5. Discussion **147**
5.1. Aim 1. Operationalize Childhood Poverty 148
5.2. Aim 2 . Examine the Psychological Consequences of Childhood Poverty 150
5.3. Aim 3 . Explore How Mentoring Promotes the Psychological Health of Youths in Poverty 154
5.3.1. Key Findings 154
5.3.2. Convergent Findings 156
5.3.3. Divergent Findings 163
5.4. Strengths and Limitations of the Study 165
5.4.1. Quantitative Study 165
5.4.2 Qualitative Study 169
5.4.3. Mixed Methods Design 171
5.5. Implications of the Study 172
5.5.1. Research Implications 172
5.5.2. Practice Implication 176
5.5.3. Policy Implication 178
5.5.4. Conclusion 179

Appendices **182**

References **239**

LIST OF FIGURES

Figure 2.1. Unified Framework.....8

Figure 2.2. Hypothetical Measurement Model of Childhood Poverty 13

Figure 2.3. Social capital as channel for positive menteesô outcome 25

Figure 3.1. Diagram illustrating the Number of Participants at Each Round of Dataé é é é .62

Figure 3.2 Latent Variable of Childhood Poverty.....65

Figure 3.3 An illustration of the study design of a convergent parallel design.....73

Figure 3.4 Steps to Mediation Analysis.....80

Figure 3.5 Flow Chart for the Process of Analyzing the Qualitative Data.....83

Figure 4.1 Participantsô Familial Socio-Economic Status (Round 1 to 5)é é é é é é é é ..89

Figure 4.2 Latent class Variable of Childhood Poverty 91

Figure 4.3 The Profile of Youths: Welfare and Non-Welfare Receiving Class.....93

Figure 4.4 Change in Psychological Health 100

Figure 4.5 Associations between Mentoring relationship, Parent-child Relationship, Family Network Size and Psychological Health.....106

Figure 4.6 Positive Effect of Mentoring relationship on Psychological Health.....111

Figure 4.7 Effect of Parent-child relationshipon Psychological Health 114

Figure 4.8 Mediating Role of Parent-child Relationship.....121

Figure 4. 9 Conceptual Framework Based on the Qualitative Findings.....140

Figure 4.10 The Merged Framework.....146

Figure 5.1 Youths from Different Types of Households and Socio-Economic Disadvantagesé 148

LIST OF TABLES

Table 2.1 Definitions of Categories 36

Table 3.1 Summary of the research designs, data collection and data analysis 37

Table 3.2 Brief Summary on the Mentorship Program of Child Development Fund and Problem Solving Skills Training and Mentorship Program for Adolescents 40

Table 3.3 Time line for the Data Collection of the Child Development Fund Program 44

Table 3.4 Number of observations available at each time point corresponding to each round of data collection 52

Table 3.5 Percentage of Missingness in Demographic Data 59

Table 3.6 Percentage of Missingness in Variables Used 60

Table 3.7. Variables and Rounds of Data Used 75

Table 4.1 Different Percentages of Youths in Class 1 and Class 2 92

Table 4.2 Multilevel Model Estimates of Change in Psychological Health 98

Table 4.3 Variables and Rounds of Data Used 103

Table 4.4 Multilevel Model Estimates of Effects of Social Relationships on the Change in Psychological Health 109

Table 4.5 Multilevel Model Estimates of Effects of Mentoring and Parent-child relationship on Psychological Health 117

Table 4.6 Multilevel Model Estimates of Effects Mentoring relationship on Parent-child Relationship 120

Table 4.7 Categories identified in the Qualitative Interviews 122

Table 4.8 Summary of Qualitative Information in Quantitative Format 143

ACKNOWLEDGEMENT

This dissertation would not have been possible without the love and support of many people.

I wish to express my enormous gratitude for the advice and guidance that my advisors, Dr. Ramesh Raghavan and Dr. Wendy Auslander, offered to me throughout the past four years of my doctoral study. They believe in me and my aspirations to improve the well-being of underprivileged youths. I was given a platform to be trained as a creative and responsible researcher, and more importantly, to be a better person. I would also like to thank Dr. John Constantino, Dr. Douglas Luke,Dr. Michael Sherraden, Dr. Jean Francis Trani and Dr. Paul Yip for guiding my research in the past year. Special thanks go to Dr. Paul Yip, Director at the Center for Suicide Prevention and Research, and Dr. Charles Leung and Dr. Simon Lai at the Network for Health and Welfare Studies, who provided me with the opportunity to carry out my dissertation research in Hong Kong, and Dr. Cecilia Chan, who was always here for me with her best wishes.

I would also like to express my deepest gratitude to my parents, who give me the freedom to pursue what I believe in. Also, I would like give thanks to my grandparents, who give me their infinite support when I decided to embark on my own journey of academic pursuit.

I would to thank to Yaowei, who has given me the courage to dream and told me that I was capable of achieving what seemed to be unattainable. I would have never summoned the courage to listen to my heart without her encouragement.

Special thanks go to my friends. Erin was (literally) by my side through all the sleepless nights at the Ph.D. lab, keeping me awake with jokes, food and love. Eling, Huy and Jeffery generously offered me care and support while I was finishing my dissertation. I would like to thank Jenny, my roommate, and my lovely cohort, Anna, Carolina, Meg, Jill and Nishesh, for the stimulating exchanges that I enjoyed so much in the past years. My thanks also go to Heidi, Cecily and Maggie for their friendships and patience during my down time.

Last but not least, my thanks to Sam, Saru and Cora for a place to write at TLF and your coffee and lime soda.

Without your love, I would not have the strength to achieve this!

ABSTRACT OF THE DISSERTATION

Childhood Poverty and Psychological Health of Youths in Hong Kong:
Mentoring as a Social Capital Intervention

By
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Doctor of Philosophy in Social Work
Washington University in St Louis, 2014

Dr. Ramesh Raghavan, Chair

Considering that one out of five youths live in poverty in Hong Kong, and poverty is found to have a negative impact on youthsô psychological well-being, this dissertation proposes mentoring as a social capital intervention to improve the psychological health of these young people, both who are locally born and who immigrated from Mainland China. In this dissertation, mentoring is defined as a social capital intervention that changes the social resources available to youths living in poverty, and such changes enhance young peopleôs positive psychological outcomes. Based on the social capital theory, poverty-related and psychological theories, three aims were formulated. Aim 1 and 2 focus on examining the definition of childhood poverty and its consequences. Aim 3 explores whether or not mentoring is a social capital intervention. **Aim 1.** Operationalize childhood poverty in Hong Kong. **Aim 2**. Examine the psychological consequences of childhood poverty. **Aim 3.** Explore how mentoring promotes the psychological health of youths in poverty.

Data and Methods. I used both quantitative and qualitative data in my dissertation. The quantitative longitudinal secondary data set consisted of 750 mentees, aged between 10 and 16, participating in the government-funded Child Development Fund Program (CDF). The qualitative data were collected through interviews from mentors (n= 15) and mentees (n=22; aged between 14 and 18) participating in a university initiated School-based Problem Solving Skills Mentoring

Program. I only used quantitative data to achieve Aim 1 and 2. Latent class analysis was adopted in Aim 1, and longitudinal multilevel level modeling was employed in Aim 2. For Aim 3, a mixed methods parallel convergent research design, which consisted of the quantitative and the qualitative stand, was adopted.

Results. A latent binary variable of childhood poverty (1= Welfare receivers and 0= Non-welfare receivers) was created in Aim 1 with the following socio-economic indicators: Receiving family welfare, living in rented housing, having low parental educational level, having at least one unemployed parents and residing in single parent family. This latent variable was used in subsequent analysis of Aim 2 and 3. For aim 2, the psychological status of mentees was found to be decreasing at a slow rate over their three years of their enrollment in CDF. Furthermore, parental perceived economic pressure was negatively associated with the psychological status of youths, but not objective indicators of childhood poverty and having experienced financial difficulty. For aim 3, findings showed that positive mentoring relationship was directly associated with the positive psychological health of mentees. In addition, mentoring relationship exerted its positive influence on menteesô psychological health via improving their parent-child relationships. The social resources generated from mentoring were direct advice, companionship, role modeling and encouragements. Mentoring also increases the family social resources of higher level of sharing between the mentees and their parents.

Discussions. Results of this dissertation provide preliminary evidence that mentoring is a social capital intervention. First, mentoring relationship improves youthsô psychological health and parent-child relationships. Second, positive mentoring relationship generates specific types of social resources, namely, direct advice, companionship, role modeling and encouragements,

conducive to positive psychological well-being of mentees. Best practices of mentoring are identified. Future research and policy directions are also initiated.

Chapter 1. Introduction

One in five children in Hong Kong lives under the official set poverty line of Hong Kong (Ngo, 2013). According to the Commission on Poverty (Commission on Poverty, 2005), although these young people are not deprived of basic necessities, such as food, clean water, free medical and education services, they lack the same opportunities to thrive as other relatively well-off youths. This notion of relative childhood poverty suggests that the definition of childhood poverty in Hong Kong should extend beyond monetary terms to non-monetary factors characterizing youths living in poverty.

The relative deprivation of non-tangible resources is perceived to be detrimental to the psychological health of youths living in poverty in Hong Kong. These young people have higher levels of hopelessness and lower levels of sense of control and self-esteem than those better off (BCGA, 2009; SOCO & HKU, 2002; SOCO & HKCCR, 2011). They also suffer from high levels of stress and low levels of happiness, life satisfaction and perceived quality of life (Shek, 2003; Shek & Lee, 2007).

Within this general population of youths living in poverty, those new arrivals from Mainland China further suffer the double jeopardy of being poor and being the ñoutsidersò of Hong Kong. New arrival youths experience social discrimination (Chan, 2012). Hong Kongôs unique colonial history and its image as an advanced and modern city have been attracting an influx of Mainland Chinese immigrants (Lo, Wong & Ma, 2005). In the 60ôs, while Hong Kong became an international and developed region, Mainland China remained as a developing country because of political turmoil. As a result, new arrivals from Mainland China are negatively labeled as *low skilled* or *ill-mannered* (Lau, 2007). Most of them recall being teased at or bullied because

of their immigrant status (Hung, 1998). A controlled experimental study on social comparison, conducted in 2006, also showed that local born adolescents were prejudiced against Mainland Chinese new immigrants (Lam, Chiu, Lau, Chan & Yim, 2006). These findings suggest that new arrival youths to dates are being discriminated, which can be harmful to their psychological wellbeing (Poulton & Caspi, 2005).

1.1 Significance of Problem

Studies on the lifetime prevalence of mental health disorders denote the onsets of disorders during adolescence, making this stage of childhood a critical window to prevent the development of negative adulthood outcomes (Kutcher & Venn, 2008, Kessler, Berglund, Demlem Jin, Merikangas & Walter, 2008). In addition, because of the stress associated with bodily, cognitive, psychological and social changes, adolescence is characterized by emotional instability and intensity (APA, 2000). Considering that adolescents are at risk of developing psychological issues, this dissertation focuses on studying young people at this developmental stage.

A strong rationale for addressing the problem of undesirable psychological health in local and new arrival youths in Hong Kong mainly lies in the speculation of high social cost. One of the most harmful outcomes of young people growing up in low-income families is their high likelihood of falling back into poverty when they become adults (Commission on Poverty, 2005). With reference to a survey conducted in 2013 among poor people in Hong Kong, poverty was associated with hopelessness: 60% of them did not believe that they could succeed in life (Ipsos Media Atlas, 2013). Such findings have an implication in childhood poverty. Without hope, youths living in poverty may be more inclined to give up, leading to their higher likelihood of failure in adulthood. As such, the problem of poverty exists across generation (Nurmi, 1991).

Considering the problem, this dissertation examines the psychological outcome of self-efficacy, which was operationalized as young peopleôs beliefs in their ability to succeed (Bandura, 1977).

Existing research also shows that poor psychological health during adolescence is wedged in higher chances of psychopathology in adulthoods (Lynam, Caspi, Moffitt, Loeber & Stouthamer-Loeber, 2012). Childhood experiences of poverty are related to maladjustments at the age of 16 and high risk of having depression at age 33 (Buchanan, Brinke & Flouri, 2000). The rate of clinical depression in adulthood also becomes higher as the duration of childhood poverty increases (Brooks-Gunn & Duncan, 1997). Mental disorders in adults increase the cost of health care services. According to a policy paper published by the Sainbury Centre for Mental Health in the United Kingdom, mental illness accounts for a large 12 % of the total public expenditure in health and social services, increases family financial burden, and decreases the productivity of a society (SCMH, 2003). In view of the consequences, this dissertation also focuses on the psychological outcome of depressive symptoms in young people.

1.2 Significance of this Study

This dissertation aims to explore mentoring as a social capital intervention to promote the positive psychological developments of adolescents in poverty. Social capital intervention is defined as an intervention that alters the social resources available to youthsô living in poverty, and such changes in resources enhance young peopleôs positive outcomes (Coleman, 1988; Lin, 2001). Mentoring is conceptualized as a social capital intervention in this dissertation. Through establishing good relationships between mentors and mentees, resources are assumed to be transferred from the adult mentors to their young mentees. First, through directly providing social support, mentoring is hypothesized to facilitate menteesô positive psychological wellbeing, namely high levels of self-efficacy and low levels of depressive symptoms. Second, mentoring is

also expected to enhance positive psychological health through improving peer and familial relationships. Findings of this dissertation add value to existing social capital literatures. To date, social capital remained as a complex concept, not to speak of social capital interventions. Results can inform us on how we can use mentoring relationship to increase the levels of social capital for positive psychological outcomes in youths.

I decide to focus on mentoring for three reasons. First, because Chinese culture values interpersonal relationships more than Western traditions (Hammond & Glenn, 2004), social resources found in positive relationships are perceived to have larger impact on young people in Hong Kong than those in western countries. Second, adolescence is a stage when the social world of youths starts to expand from their immediate family to the external community (APA, 2000). Establishing desirable relationships with adults or peers outside of the family systems is expected to have larger positive psychological effect on adolescents than young people at other developmental stages. Third, the emerging interest in mentoring in Hong Kong creates an environment suitable to carry out this research. In 2005, the government of Hong Kong introduced the Child Development Fund Program (CDF) to drive up the developmental outcomes of the youth living in poverty. In the second half of 2013, the fourth batch of CDF was launched. The policy makersô interests in mentoring programs create a platform for me to carry out my dissertation.

1.3 Aims

This research consists of three aims. The first two aims of this dissertation attempt to provide a general picture of childhood poverty in Hong Kong and its psychological effect on youths. These two aims are quantitative in nature and utilize the secondary longitudinal data set obtained from the Child Development Fund Program.

Building on the results of the first two aims, the last aim explores how mentoring improves the positive psychological health of youths living in poverty. This third aim adopts a mixed method research approach that uses quantitative data from Child Development Fund Program and qualitative data from a non-government funded mentoring program, the School-based Problem Solving Skills Mentoring Program. The following were the three aims of this dissertation:

Aim 1. Operationalize childhood poverty in Hong Kong. The definition of childhood poverty commonly used in Hong Kong is based on monetary terms, with household income that was 50% below the cityôs medium income household level. While this definition provides some guidance for us to identify youths living in poverty and to design poverty alleviation programs, Hong Kong does not have an official definition for childhood poverty.

In addition, recent childhood poverty literature has been using the capability approach, social exclusion approach and human-rights based approach to understand childhood poverty (Minujin, Delamonica, Davidziuk & Gonzalez, 2006; Sen, 1999; Atkinson, Cantillon, Marlier, & Nolan 2002; Minjuin & Nandy, 2012). Simply identifying poor youths from low-income households may seem obsolete, and may cause us to neglect those who have passed the threshold of poverty, but still do not have adequate access to non-marketed based goods that determines their well-beings (Minujin, Delamonica, Davidziuk & Gonzalez, 2006). Examples of these goods are harmonious family relationships, educational resources and relaxed living environments.

Considering that these non-monetary deprivations vary across countries (Chen & Coark, 2008), it is important to define childhood poverty unique to the social context of Hong Kong. In this dissertation, the monetary approach and the human-rights based approach are used to define childhood poverty, and childhood poverty is operationalized as living in families receiving social

security, living in rented housing, having parents with low educational level, having at least one unemployed parents and residing in single parent family. Latent class analysis using data from the Child Development Fund Program are conducted to achieve this aim.

Aim 2. Examine the psychological consequences of youth living in poverty. Although existing childhood poverty research in Hong Kong shows that youths living in poverty have poor psychological health, these studies tend to be cross-sectional and based on descriptive or bivariate analysis (BGCA, 2009; SOCO & HKU, 2002; SOCO & HKCCR, 2011, Shek, 2003, 2005). While such findings provide us with some understanding on the effect of childhood poverty in Hong Kong, a longitudinal study offers a more comprehensive picture on the topic of interest. Considering the gap in the literature, I use the longitudinal data of Child Development Fund Program to understand the effect of childhood poverty on the change in psychological health over time. Findings offer stronger empirical evidence on the association between childhood poverty and adolescentsôpsychological development.

Aim 3. Explore how mentoring promote the psychological health of youth in poverty. Mentoring programs implemented in other developed regions have been proven to be effective in promoting the psychological well-being of youths, namely, increasing self-esteem, decreasing depressive symptoms and enhancing overall life satisfaction (Lee &Cramond, 1999; DuBois & Silverton, 2005; Rhodes, Reddy & Grossman, 2005; Whitney, Hendricker & Offut, 2011; Langout, Rhodes & Osborne, 2004; Karcher, 2008; Rhodes, Haight &Briggs, 1999; Bodin & Hakan, 2011; Herrera et.al, 2011). Studies show that through providing direct advice and encouragement as well as being role models and special friends, mentors can enhance the psychological and social outcomes of the mentees (Whitney, Hendricker & Offutt, 2011; DuBois, et al. 2011).

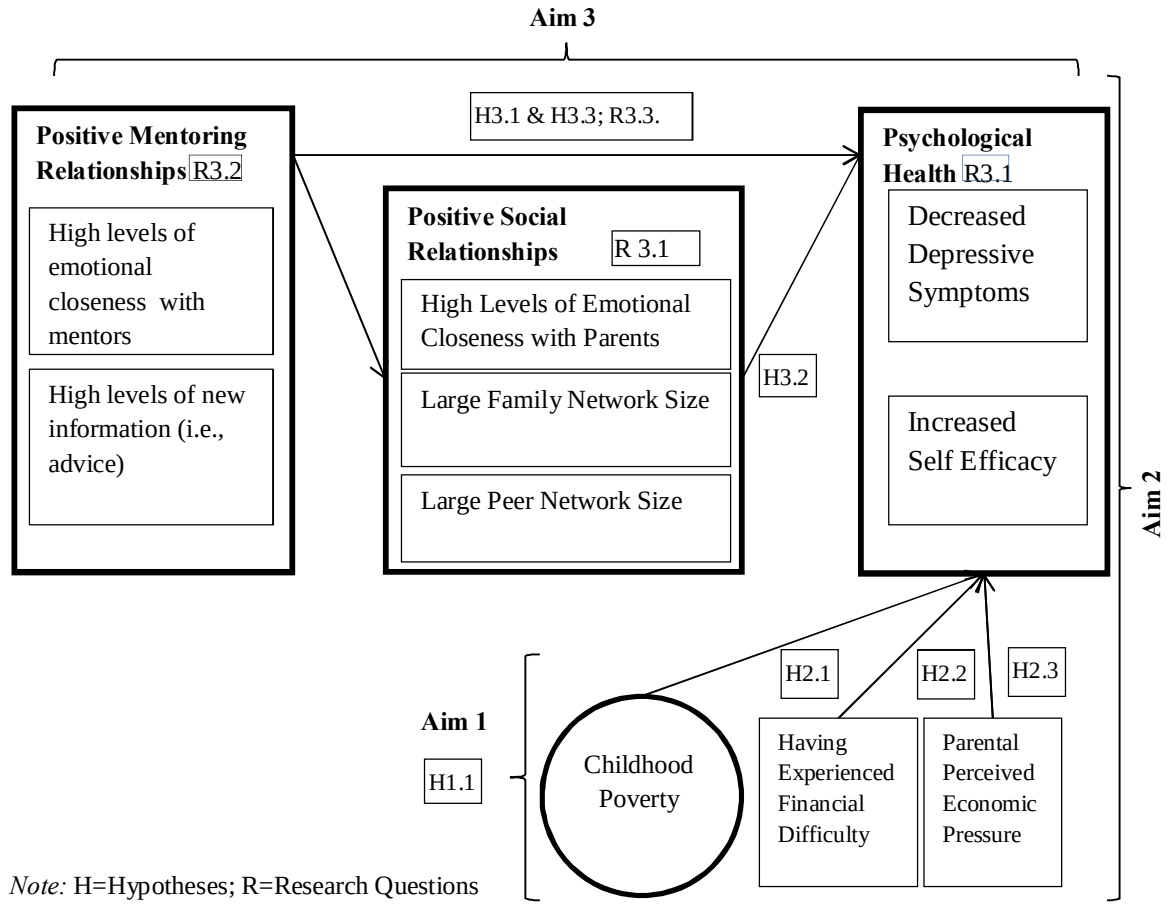
Despite the extensive research evidence, the association between quality of mentoring relationship and psychological health of youths in Hong Kong is not clear. Nor is it clear on the kinds of social resources embedded in mentoring relationship that contribute to the positive psychological well-being of these youths. As such, there is a need to further understand the underlying mechanism of mentoring to inform future practices and the design of it as an intervention to build social capital.

Both quantitative and qualitative data were used to achieve this aim. I used quantitative data to examine whether or not positive mentoring relationship could improve the positive psychological outcomes of the youth living in poverty. I further unfolded the mechanism by examining the mediating roles of parent-child, family and peer relationships in the effect of mentoring on psychological health. Last, through the use of qualitative interviews, I explored different kinds of social resources embedded in mentoring and how they affected the psychological and social outcomes of the mentees.

Chapter 2. Theories and Literature Review

This chapter discusses the theories and empirical findings pertaining to the three aims of this dissertation. **Aim1.** Operationalize childhood poverty in Hong Kong. **Aim 2.** Examine the psychological consequences of childhood poverty. **Aim 3.** Explore how mentoring promotes the psychological health of youths in poverty. Findings of these three specific aims provide me with information on understanding mentoring as a social capital intervention for youthsôpsychological health. The following is a unified framework of this dissertation, illustrating the aims and the corresponding hypotheses and research questions (Figure 2.1).

Figure 2. 1. Unified Framework



Specific Aim1. Operationalize childhood poverty in Hong Kong

Hypothesis 1.1. Family welfare status, home ownership, parental education level, parental employment status and family configuration are indicators of the latent variable of childhood poverty.

Specific Aim 2. Examine the psychological consequences of the youth living in poverty.

Hypothesis 2.1. The latent variable of childhood poverty has a negative effect on the change in the psychological health of youths living in poverty.

Hypothesis 2.2. Having experienced financial difficulty has a negative effect on the change in the psychological health of youths living in poverty.

Hypothesis 2.3. Parental perceived economic pressure has a negative effect on the change in the psychological health of youths living in poverty.

Specific Aim 3. Explore how mentoring works to promote the psychological health of the youth in poverty.

Hypothesis 3.1. Mentoring relationship has a direct positive effect on the change in the psychological health of youths living in poverty.

Hypothesis 3.2. Different types of natural social relationships have direct positive effects on the changes in the psychological health of youths living in poverty.

Hypothesis 3.3. Natural social relationships mediate the positive effect of mentoring on the psychological health of youths living in poverty.

Research Question 3.1. What are positive psychological and social outcomes experienced by the mentees after participating in a mentoring program?

Research Question 3.2 What kinds of social resources are generated by positive mentoring relationship?

Research Question 3.3. How are these social resources associated with different types of psychological health?

2.1. Aim 1. Operationalize Childhood Poverty

To date, there is not uniform approach to defining or measuring childhood poverty (Minujin, Adlamonica, Davidziuk & Gonzalez, 2006). The literature in poverty is dominated by four approaches, which are the monetary approach, the capability approach, the social exclusion approach and the human-rights based approach (Wagle, 2002; Redmond, 2008; Minujin, Adlamonica, Davidziuk & Gonzalez, 2006; Minujin & Nandy, 2012). This dissertation used the monetary approach and the human-rights based approach to define childhood poverty in Hong Kong. In the following, I briefly describe the four approaches and discuss my rationale for choosing the monetary and the human-rights based approach.

The monetary approach to identifying and measuring poverty is most commonly used. Poverty is defined with a shortfall in consumption below the poverty line (Stewart, Saith & Harris-White, 2007). In Hong Kong, the government defines poverty with the financial indicator of household income (Census & Statistics Department [HKSAR], 2013). Those living in families with income less than half of the median household income of the city are considered poor. Using this official poverty line, approximately 20% of youths are suffering from poverty in Hong Kong (Ngo, 2013).

The use of the monetary approach to understand childhood poverty is justified by the fact that it is considered orthodox and most influential in influencing policy within the arena of poverty research (Laderich, 2000). In addition, it provides a standardized and universal way for us to measure childhood poverty (Watts, 1993), allowing researchers to compare levels of childhood poverty across society (Chen & Coark, 2008). Therefore, I use this approach to define childhood poverty in my dissertation. Yet, this approach offers a rather narrow understanding of childhood poverty, because poverty means more than the lack of materialistic resources (Sen, 1999).

The capability approach (Sen, 1999) defines poverty as the failure to achieve certain or basic capabilities (i.e., all possible achievements that an individual may have). The core concept in the capability approach lies in individualsô freedom in utilizing resources to improve their well-being. Sen argues that the deprivation of resources is not a reliable indicator of childhood poverty; rather, it is individualsô choice in using the available resources that determines their well-being (Laderchi, Saith & Stewart, 2003). Although the capability approach taps into the multidimensionality of childhood poverty, it is difficult to measure the choice of individuals in how they transform resources into achievements. In order to avoid losing such a key insight of the capability approach, I decide not to use it to define childhood poverty in my dissertation.

The social exclusion approach suggests that childhood poverty should be defined as the process in which children are wholly or partially excluded from full participation in the society (Deakin, Davis & Thomas, 1995). Although the definition of social exclusion remains ambiguous (Redmond, 2008), Atkinson, et al. (2002) identifies three elements of social exclusion that are relevant to notion of childhood poverty in Hong Kong. First, exclusion is a relative concept. Hong Kong, as an economically advanced city, does not suffer from the problem of absolute poverty; rather, it is the issue of relative poverty that matters. Second, social exclusion concerns with identification of actors causing it, which implies that we should not only focus on individuals but also on the larger environment. This argument goes along with the central concept of child development, which emphasizes the influences of the external social system, namely, family, community, and culture on the outcomes of youths (Brofenbrenner, 1979). Third, this approach focuses on dynamics: while peopleôs current situation is important, their prospects for the future should not be ignored. Such a characteristic also aligns with the longitudinal aspect of child development. The disadvantaged circumstances that the youths are experiencing will affect their

future outcomes. However, social exclusion approach does not provide a clear guideline on how poverty should be operationalized (Laderchi, Saith & Stewart, 2003). Therefore, even though the characteristics of social exclusion cover with the underlying principles of child development, I did not adopt this approach to define childhood poverty in this dissertation.

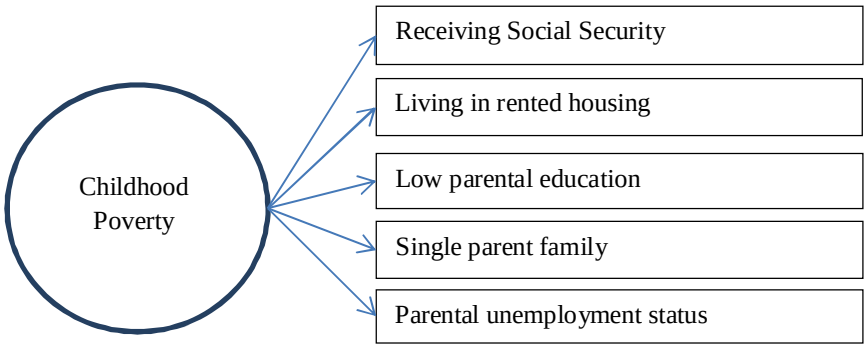
Recent literatures have been calling for a human-rights based approach to define childhood poverty (Minujin, Adlamonica, Davidziuk & Gonzalez, 2006; Redmond, 2008; Pemberton, Gordon & Nandy, 2012). The central principal to understand childhood poverty using the human-rights based approach is recognizing the rights of children as individuals and that their needs are unique of adults (Redmond, 2008). Such a conceptualization offers us a guideline to identify the special needs of children for their developments (Redmond, 2008). Based on the human rights-based approach and the Convention on the Rights of Child, UNICEF defines childhood poverty as the deprivations of material, spiritual and emotional resources that are essential to the well-being of children (UNICEF, 2005). I use the human-rights based approach to define childhood poverty because the rights of children are universal (Redmond, 2008; Pemberton, Gordon & Nandy, 2012). In addition, this rights based framework facilitates the definition of childhood poverty as multidimensional: the rights of children are diverse and consist of multiple components (Pemberton, Gordon & Nandy, 2012).

With reference to the monetary and human-rights based approach, this dissertation defined childhood poverty as the lack of familial monetary resources and the deprivation of positive familial relationships. I operationalized childhood poverty in Hong Kong using familial characteristics because: First, the use of household indicators to reflect levels of childhood poverty was well grounded in existing literatures (Abernathy, Webster & Vermeulen, 2002; Blanden, 2006; Copley & Williams, 2006; Essen & Wedge, 1982; Graham, 2006; Graham &

Power, 2004; Gregg & Machin, 1998; Hobcraft, 2003; Nicholson, Luca, Berthelsen & Wake, 2012; Osler, Godfredsen & Prescott, 2008). Second, according to the child development perspective, the family system is the immediate social environment that children are nested in. Therefore, it made sense to understand childhood poverty within the context of their families.

Indicators of childhood monetary poverty in this dissertation include familial welfare status and homeownership. As for indicators associated with the human-rights based approach, parental education level, parental employment status and family configuration are also considered indicators of childhood poverty in this dissertation. Figure 2.2 is the hypothetical measurement model of childhood poverty. In the following, I provide a justification on the selection of these indicators to represent childhood poverty in Hong Kong.

Figure 2. 2. **Hypothetical Measurement Model of Childhood Poverty**



2.1.1. Monetary Approach to Childhood Poverty

This section describes the income and tangible asset based notion to justify the adoption of family welfare status and home ownership as indicators of childhood poverty in my dissertation.

2.1.1.1. Income Based Notion

Living in a household with income under the poverty line is the most common definition of childhood poverty. UNICEF-IRC (2005) draws the poverty line at 50 per cent of current

medium income for the country concerned. The World Bank considers 1.25 USD per day per capita as the international poverty line (Ravallion, Chen & Sangraula, 2008). Alternatively, in the U.S., poverty means having a household income that is lower than the food budget minimally adequate for a familyôs subsistence (Orshansky, 1963). Studies using the monetary approach to define childhood poverty show that children from low income households tend to have less desirable physical, emotional, behavioral and educational outcomes than non-poor young people, which supports that household income is a good indicator of childhood poverty (Aber, Bennett, Conley & Li, 1997; Abernathy, Webster & Vermeulen; 2002; Dashiff, DiMicco, Myers & Sheppard, 2009; Duncan, Yeung & Brooks-Gunn, 1998; Guo, 1998; Eamon, 2002; Langton, Collisaw, Goodman, Pickles & Maughan, 2011).

Although the use of household income provides us with a standardized metric to differentiate the rich from the poor (Watts, 1993), adopting it to be the sole indicator of childhood poverty seems inadequate (Minujin, Delamonica, Davidziuk & Gonzalez, 2006; Minujin & Nandy, 2012). First, the idea of household income only implies present earnings, but fails to acknowledge past familial savings, inheritances or ownerships. For instance, a family with a low household income but a large inheritance cannot be considered poor. Second, current income ignores non-cash benefits, such as food stamps, housing, and medical services (Whyte, 1997; Hurst, 2004). Hence, having household income below the poverty line in ignorance of other factors cannot constitute a comprehensive measure of childhood poverty (Hurst, 2004).

2.1.1.2 Tangible assets notion

The idea of tangible assets extends monetary poverty from income to savings, property ownerships and investments (McKernan & Sherraden, 2008). Tangible assets are believed to capture other financial aspects of childhood poverty that household income fails to address. First,

these assets can provide safety nets for families during times of economic hardships, making them and their children less vulnerable to transitory poverty (McKernan & Sherraden, 2008). For example, a family with savings and properties tends to experience less stress when the breadwinner of the family loses his or her pay check. Properties can also be converted into money to provide income for families when needed. Second, assets can be passed through generations, which can be used to promote the upward mobility of children (McKernan & Sherraden, 2008). For instance, families with low current income may have high amount of savings that allow them to pay for their children's educational expenses (McKernan & Sherraden, 2008; Shapiro, 2004). Therefore, children from families with high levels of savings or properties may have higher chances of developing positive outcomes than their disadvantaged counterparts in the long run (Shapiro, 2004).

2.1.1.3. The Monetary Indicators of Childhood Poverty

Two indicators are used to represent the monetary aspects of childhood poverty in this dissertation. The first is family welfare status, measured in terms of whether or not a family is receiving social security. In Hong Kong, the household income of a family needs to fall below a certain level in order to be eligible to receive financial assistance from the government. As such, family welfare status is an objective proxy for household income. This indicator also captures the tangible asset perspective on childhood poverty. According to the social policy of Hong Kong, a family's total non-income based asset (e.g., cash, bank savings, cash value of insurance policies, or investments in stocks and shares) needs to be under a certain limit for this family to be eligible for social security. Therefore, family welfare status also captures the tangible aspects of childhood poverty.

The second indicator is home ownership, measured in terms of whether or not the youthôs family is living in rented or privately-owned housing. The indicator of home ownership also addresses the tangible assets perspective on poverty. According to previous study, youths growing up in low-income households had higher chances of living in rented housing (Langton, et al., 2011). As such, living in rented housing is used as a cut-off point to reflect childhood poverty in this dissertation.

2.2.1. Human Rights-Based Approach

The following discuss the use of the Family Investment Model and Family Stress Model to represent childhood poverty under the umbrella of the human-rights based approach.

2.2.1.1. Family Investment Model

The Family Investment Model (Conger & Donnellan, 2007; Conger & Donnellan, 2010) stems from the economic principle of investment. The theory suggests that parents with greater financial, social and human capital benefit youthsôdevelopments. Conger and Donnellan (2007) extend on the traditional monetary and asset approach by proposing that parental education level influence the development of their children. They use parental investment as the central organizing principal to suggest that parental education positively affect young peopleôs outcomes.

Melby, Conger, Fang, Wickrama and Conger (2008) support the Family Investment Model by pointing out that parental education level is tied up with supportive parenting, which is then associated with adolescentsôeducation attainment. Youths whose parents are more educated tend to provide positive stimulation, such as toys, books and outside-school activities, for their childrenôs cognitive and education developments (Conger & Donnellan, 2007). High levels of parental investment, namely, language and visual stimulation, and books and new learning experiences, also mediate the relationships between positive effects of family income on

children's cognitive and behavioral developments (Linver, Brooks-Gunn & Kohen, 2002). As a result, children with parents of high education levels tend to have high levels of academic achievement as well as positive physical and mental health (Gregg & Machin, 1998; OECD, 2010; Peters & Mullis, 1997; Teachman, Paasch, Day & Carver, 1997).

2.2.1.2. The Family Stress Model

The Family Stress Model (Conger, Elder & Lorenzo, 1994), which stems from the Iowa Youth and Family Project[1], indicates that poor familial economic status creates high economic pressure, which affects the family process of inter-partner relationships and parenting styles, resulting in children's poor health outcomes. In contrast to the Family Investment Model, the Family Stress Model uses stress as the central organizing principal to explain the negative effects of childhood poverty. First, economic hardships create pressure in couples, which cause them to have poor emotional well-being. Such negative psychological consequences result in undesirable spousal relationships. This part of the theory is supported by the literature: low-income household is highly represented by single parent families (Brown, 2004; Eamon, 2001; DuBois et al. 1994; Langton et al., 2011).

Poor spousal relationships then lead to undesirable parenting styles, which result in negative psychological outcomes of youths. Studies show that economic hardships often lead to depression and aggressive behaviors via harsh parenting styles (Elder, Conger, Foster & Ardelt, 1992; Conger, et al, 2002). Findings also suggest that low levels of nurturing are often associated with low levels of positive school behaviors, persistence and positive affect on children (Conger, et al., 2002). In Hong Kong, parents from low-income households also tend to suffer from high levels of stress (SOCO & HKCCR, 2011). Empirical studies show that such parental stress is

[1] The Iowa Youth and Families Project was a longitudinal study launched in 1987, aiming to understand the consequences of the farm crisis in late 70s. Four hundred and fifty one families in rural Iowa were studied.

translated into harsh parental styles and weak parent-child relationship among low-income families (Shek, 2003). Finally, these adolescents, because of their poor parent-child relationship, develop mental health disturbances (Shek & Lee, 2007; Shek, 2007).

2.2.1.3 Human Rights-Based Approach Indicators of Childhood Poverty

Three indicators are used to reflect the human-rights based approach to childhood poverty in this dissertation: low parental education level, single parent family and parental unemployment status. According to the Family Investment Model, parents with low education level are expected to have lower abilities to provide positive stimulations for their children, resulting in the deprivation of resources that curb their childrenôs developmental opportunities.

For the indicator of single parent family, as suggested by the Family Stress Model (Conger & Elder, 1994), the economic pressure experienced by couples leads to undesirable spousal relationships, which may bring forth divorce. In addition, low-income households are largely represented by single parent family (Brown, 2004; Eamon, 2001; DubBois et al. 1994; Langton et al., 2011). Therefore, living in a single parent household can serve as an indicator of childhood poverty.

Last, with reference to the Family Stress Model (Conger, Elder & Lorenzo, 1994), parental unemployment tends to be associated with high levels of parental stress (Westter-Straton, 1990), which may result in poor spousal relationships and harsh parenting styles. A study on unemployed African American single mother reveals that unemployment has a direct effect on maternal depressive symptoms resulting in punitive parenting styles (McLoyd & Jayaratne, 1994). The indicators of single parent and parental unemployment, thus, are used to represent the deprivation of harmonious parent-child relationships among youths in low-income households.

2.3.1. Hypothesis

With reference to these approaches and empirical findings, I hypothesize that childhood poverty in Hong Kong are represented by the indicators of family welfare status (i.e., receiving social security), home ownership (i.e., living in rented housing), parental education level (i.e., low parental educational level), parental employment status (i.e., parental unemployment status) and family configuration (i.e., single parent family status) (**Hypothesis 1.1**) (Figure 2.2).

2.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty

In Hong Kong, children living in poverty have poorer psychological outcomes, namely, lower levels of self-efficacy, self-esteem, life satisfaction and happiness, and higher levels of stress and hopelessness than non-poor children (BCGA, 2006, 2009; SOCO & HKU, 2002; SOCO & HKCCR, 2011, Shek, 2003, 2005; Shek & Lee, 2007). Studies in the United States and the United Kingdom also suggest the negative psychological consequences of childhood poverty. Youths growing up in poverty are 10 to 20 percent more likely than non-disadvantaged children to manifest psychological problems (Currie & Stabile, 2007), such as lower self-confidence and higher levels of depression (Poulton & Caspi, 2005; Hertzman, McLean, Kohen, Dunn & Evans, 2002; McLeod & Shanahan, 1996).

Theories explaining the high levels of depression in poor youths are the Family Stress Model (Conger, Elder & Lorenzo, 1994) and the Theory of Developmental Trauma (van der Kolk, 2005). These two theories use stress to explain the negative psychological consequences of childhood poverty. For the low sense of self in poor youths, the Family Investment Model (Conger & Donnellan, 2007) and Self Efficacy Theory (Bandura, 1977) offer explanations by seeing the lack of intangible parental resources, namely, advice, role modeling and expectations, as reason behind the low self-efficacy in youths from low-income families.

Considering the empirical findings and theoretical assumptions, poor psychological health is defined as high levels of depressive symptoms and low levels of self-efficacy in this dissertation. Given that I have already discussed the Family Stress Model in the above section, I only review the Theory of Developmental Trauma in the following. Similarly, because I have introduced the Family Investment Model earlier, I focus my discussion below on the Self Efficacy Theory.

2.2.1 Theory of Developmental Trauma

Consistent with the Family Stress Model (Conger, Elder & Lorenzo, 1994), the Theory of Developmental Trauma (van der Kolk, 2005) uses stress to explain the negative relationships between childhood poverty and depressive symptoms in adolescents. The difference between the Theory of Developmental Trauma and the Family Stress Model lies in the sources of stress. Conger et al. (1994) only focus on parental stress, whereas van der Kolk (2005) also emphasizes on other aspects of stress associated with poverty, such as crowded living environments, neighborhood violence and social discrimination (Kiser, 2007).

The Theory of Developmental Trauma adopts a biological perspective to explain the pathway from poverty and stress to undesirable psychological outcomes. Research shows that the neurobiological and physiological systems of young people under stress are constantly heightened to prepare them for stressful situations (van der Kolk, 2003). Comparison studies show that stress-related hormone activity, heart rate and blood pressure of the young with traumatic experiences are significantly higher than the control group (Pitman, 1989; De Bellis et al., 1999). Hence, young people under chronic stress are always ñon-guardò with heightened emotional systems, which may damage their emotional regulation abilities (van de Kolk, 2003). Their malfunctioning

emotional regulatory systems cause them to exhibit relatively high levels of depressive symptoms (Silk, Stenber & Morris, 2003; dôAcremont & Van der Linden, 2007).

The theory is supported by empirical evidences which associate the stressful environments that poor youths live in with their emotional problems. Crowded housings and neighborhood violence create stress in both parents and young people, resulting in anxiety and depression in youths (Conley, 2001; Dashiff, DiMicco, Myers & Sheppard, 2009; Deng, et al., 2006; Eamon, 2001a ; Goux & Maurin, 2005; Kiser, 2007; Langton et al., 2011; Leung & Shek, 2011; Maxwell, 1996). In Hong Kong, youth in poverty also experience high levels of stress associated with their crowded living and unsafe neighborhood environments (SOCO & HKCCR, 2011; SOCO, 2003).

Social discrimination also matters. Poor children are more likely to experience stigmatization, peer rejection and isolation at school (Weissboard, 1996; Smith. 2010). A personal account of a homeless child recalled his friend saying that he should be put up for adoption and his mother should be hospitalized (Weissbourd, 1996). Youths in Hong Kong also indicate that they are discriminated by their peers because of their adverse familial financial situations (SOCO & HKCCR, 2007; 2011). A child from a low-income family once expressed in a television program that he was embarrassed about his living conditions as he felt inferior compared to his peers (Television Broadcasts Limited [TVB], 2011). Stigmatization associated with poverty may lead to feelings of inferiority and thus, the development of depressive symptoms (Reid, 2004).

2.2.2. Self-Efficacy Theory

For the association between childhood poverty and low self-efficacy, the Family Investment Model (Conger & Donnellan, 2007) and Self-Efficacy Theory (Bandura, 1977) tell us that a lack of parental investment may lead to low self-efficacy in youth. A study based on the Family Investment Model shows that inductive parenting, in which parentsôuse of reasoning,

explaining and talking techniques to exhort their children to behave and discipline, results in higher levels of self-efficacy in adolescents (Whitbeck, et al., 1997). Intuitively, youths in low families, with parents incapable of adopting supportive parenting, tend to have lower self-efficacy.

Yet, the Family Investment Model (Conger & Donnellan, 2007) fails to explain how parental investment is associated with high levels of self-efficacy in children. The Self Efficacy Theory proposed by Bandura (1977) fills this gap. Self-efficacy refers to individualsô beliefs in their abilities to accomplish tasks (Bandura, 1977). The role of self-efficacy is especially important for youths living in poverty as it will increase their resilience against negative circumstances. Adolescents who have high sense of self-efficacy believe that they can succeed despite of the negative events that they encounter (Benight & Bandura, 2004). On the other hand, youths with low levels of self-efficacy do not have the capacity to deal with the negative impact of unfortunate events (Benight & Bandura, 2004).

Self-efficacy can be fostered through the process of ñvicarious experienceò, ñsocial persuasionò and ñemotional arousalò (Bandura, 1977, p. 195). These three sources of self-efficacy explain how parental investment is associated with youthsô self-efficacy (Bandura, 1977). For vicarious experiences, observing the success of role models allows youths to generate an expectation on themselves that they can also achieve similarly. The successful stories of their parents may make them believe that they also have the ability to succeed. Successful parents can motivate their off-springs to work harder and believe that they can also have greater achievements later. Youths in low-income families may not have successful parents whom they can look up to, causing them to have low self-efficacy.

For social persuasion, adolescents who face high expectations and receive advice from others tend to believe that they are capable of high achievements (Bandura, 1977; Bandura &

Baranelli, 1996). Parents of adolescents growing up in poverty may not have the time, cognitive and emotional capacity to provide such support for their children (Leung & Shek, 2011). As such, they may have low self-efficacy.

Last, emotional arousal affects a personôs efficacy in achieving a task through judgments. A person who is negatively aroused tends to judge that he or she has lower chances of succeeding. As mentioned before, youths in poor families tend to be stressed and have parents who are also feeling pressured by their economic situations (Conger, Elder & Lorenzo, 1994; Van de Kolk, 2003). Such negative emotional arousal may cause them to believe that they are unable to control their undesirable circumstances, resulting in low general self-efficacy.

The theoretical concepts proposed by the Family Investment Model (Conger & Donnellan, 2007) and the Self Efficacy Theory (Bandura, 1977) echo with the phenomenon of immigrant paradox in new arrivals of impoverished youth in Hong Kong. The immigrant paradox, which was proven by research (Tam & Lam, 2005; Chan, 2012), suggests that even though poor adolescents in Hong Kong may have high likelihood of developing undesirable outcomes, they thrive because of high levels of parental involvements. Yet, youths living in relative poverty may not always have supportive parents or adults that can cultivate their self-efficacy. According to studies in the United States, poor children are labeled as gangsters, criminals, drug abusers and teenage parents by the society (Weissbourd, 1996). Such expectations from socializers significantly affect the self-efficacy of these young people, which is then associated with the development of poor self-image (Poulton & Caspi, 2005; Reid, 2004).

2.2.3. Hypotheses

In this dissertation, positive psychological health is defined as low levels of depressive symptoms and high levels of self-efficacy. The following hypotheses are formulated. **Hypothesis**

2.1. The latent variable of childhood poverty has a negative effect on the change in the psychological health of youths living in poverty. **Hypothesis 2.2.** Having experienced financial difficulty has a negative effect on the change in the psychological health of youths living in poverty. **Hypothesis 2.3.** Parental perceived economic pressure has a negative effect on the change in the psychological health of youths living in poverty.

2.3 Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty

Considering the negative consequences of childhood poverty, this section adopts the social capital theory and proposes mentoring as a social capital intervention to improve the psychological health of poor youths. In this dissertation, social capital intervention is defined as an intervention that change the social resources available to youthsô living in poverty, and such resources will enhance the young peopleôs positive outcomes (Moore, Salberg & Leroux, 2013). Using the network perspective of social capital, mentoring is defined as the process of establishing a relationship between an adult and a young person, in which resources in this relationship will improve the positive outcomes of this adolescent (Smith, 2007; Gaddis, 2012; Moore, Salsberg & Leroux, 2008). Figure 2.3 illustrates how mentoring is conceptualized as a social capital intervention in this dissertation. The process of connecting a mentor and mentee changes the social capital of the mentee and his or her positive outcomes in turn. As a channel, social capital mediates the effect of mentoring on positive psychological outcomes of youths (Moore, Saleberg & Leroux, 2013).

Figure 2. 3. Social capital as channel for positive mentees' outcome

It makes sense to understand mentoring through the social capital lens, because it coincides with the key perspectives of social capital. Social capital is conceptualized to be is inherited in the structure of social relationships and that it facilitates outcomes (Bourdieu; 1986; Coleman, 1988; Putnam, 2001; Lin, 1999). Although social capital remains a complex concept, with different scholars adopting a dissimilar definition of it, I use Colemanôs (1988) and Linôs (2001) definition of social capital to conceptualize mentoring. In the following, I briefly discuss the different definitions of social capital proposed by various sociologists. I also justify my decision to adopt Colemanôs and Linôs perspective of social capital to understand mentoring.

2.3.1. Social Capital Theory

Bourdieu (2001), Putnam (1993, 1995, 2001), Coleman (1988) and Lin (2001) and are among those contemporary social scientists who write about social capital. Bourdieu conceptualizes social capital as connections that bind similar people together. Extending from the definition, Bourdieu suggests that social capital are resources existed among middle or upper class people to prevent the ówrongôpeople from entering the group (Bourdieu, 2001). Although Bourdieu portrays a realistic conception of social capital, it only explains a social phenomenon, which has little intervention value.

On the other hand, Putnam sees social capital as close community networks, high levels of civic engagements and high levels of social trust, that are conducive to positive social well-being (Putuam, 1993, 1995, 2001). He measures the levels of social capital across all American states and finds that states with higher levels of social capital tend to have lower economic inequality, lower crime rates, and higher levels of educational achievement (Putnam, 2001; Helliwell & Putnam, 1997). Although Putnamôs definition of social capital adds value to community-based research and intervention (Kreuter & Lezin, 2002), it has little relevance to the mentoring, which is considered an individual-level intervention.

Coleman (1988), instead of defining social capital as a social entity like Putnam, suggests that social capital do not only benefit community as a whole, but also individuals. As stated by Coleman (1988), ñSocial capital is defined by its function. é consist of some aspects of social structures, and they facilitate certain actions of actors ï whether person or corporate actors - within the structure. Social capital is productive, making possible the achievement of certain ends that in its absence would not be possible.ò (p.98). Colemanôs concept of social capital is defined by its function, suggesting that the relationship between a mentor and a mentee itself is a social capital if it produces positive outcomes.

Lin (2001) criticizes such conceptualization as a tautology, because it is impossible to build a theory if the causal explanation of social capital is only captured by its effect. As such, Lin expands Colemanôs definition by suggesting that social capital is defined as ñresources embedded in a social structure which are accessed and/or mobilized in purposive actions.ò(p.12) Because Lin provides a more definite and board idea on social capital than Coleman, I adopt Linôs definition in this dissertation to conceptualize mentoring as a social capital intervention. Having mentors increases menteesô access to the social resources embedded in the dyadic structure of

mentoring relationship, which improve the psychological health of youths. However, Lin emphasizes that social capital should be defined by the accessibility of the resources to individuals, and use of the resources by individuals. Therefore, in order to define mentoring as a social capital intervention, apart from facilitating positive outcomes (Coleman, 1988), the social resources in mentoring needs to be accessible and utilized by the mentees.

Forms of Social Capital. Referring back to Colemanôs (1988) definition on social capital, some of his notions on *Forms of Social Capital* also guide me to further understand mentoring as a social capital intervention. He identifies three different forms of social capital, elaborating that these forms are ñjust what is about social relations that can constitute useful capital resources.ò(p.101). The three forms of social capital are: i) *Obligations, expectations and trustworthiness of structures*, which primarily suggests that trust and reciprocity are salient component of social capital; ii) *Information*, which is the exchange of information (e.g., advice or new ideas) that facilitates action; iii) *Norms and effective sanctions*, which is the idea that social norms causes individuals to behave in certain ways. Colemanôs discussion on trusts and information as forms of social capital goes along with the components of good mentoring relationships (DuBois et al., 2011; DuBois & Neville, 1997; Whitney, Hendricker & Offutt, 2011). For social norms, Coleman explains it on the collective level, which has little relevance to mentoring.

Colemanôs notion on the forms of social capital guides me to ponder that researchers should look beyond the mere existence of mentoring intervention, and consider the effect of mentoring relationship. Because of this, I decide to expand on current literatures and look at the effect of mentoring relationship on youthsôpsychological health in this dissertation.

Bridging and Bonding Social Capital. Social capital operates on two levels: bridging social capital and bonding social capital (Kawachi, Subramanian & Kim, 2008; Heaney & Israel, 2008). Bridging social capital refers to resources that are accessed through connections that cross class and other boundaries of social identity (Kawachi, Subramanian & Kim, 2008). The process of establishing a connection between an upper or middle class adult and an adolescent from a low income family can be seen as a way of generating bridging social capital for the mentees.

Bonding social capital is resource accessed through people of similar characteristics (Kawachi, Subramanian & Kim, 2008). The process of establishing a relationship between middle or upper class mentors and mentees from low-income households creates resources in cross class connections, which increases menteesôaccess to bridging social capital. I also conceptualize that mentoring can improve the quality of menteesônatural social relationships, which can increase menteesôbonding social capital.

2.3.2. Mentoring as a Social Capital Intervention

This dissertation explores whether or not mentoring is a social capital intervention by: i) examining the direct positive effect of mentoring relationship on the psychological health of youths; ii) testing the indirect effect of mentoring relationship on psychological health via social relationships; iii) identifying the types of social resources embedded in mentoring relationship and other social relationships that facilities positive psychological health outcomes. Examining the direct positive effect of mentoring relationship on youthsôpsychological outcomes fulfills the basic definition of social capital of facilitating positive outcomes (Coleman, 1988), as well as provides us with the preliminary information on whether or not mentoring can generate bridging social capital. Testing the mediating role of natural social relationships further tells us whether or

not such bridging social capital can create bonding social capital. Last, identifying the social resources embedded in the relationships offers additional information on the types of social resources found in mentoring.

2.3.2.1. The Direct Effect of Mentoring relationship on Psychological Health

The examination of the direct positive effect of mentoring relationship on psychological health (i.e., Hypothesis 3.1) provides us with preliminary evidence on whether or not the dyadic connections between mentees and mentors facilities positive psychological outcomes. Empirical findings in the literature show that mentoring lead to better psychological health in youths. Mentoring is demonstrated to be effective in improving the sense of ñselfò, namely, global self-worth, self-esteem and self-efficacy (Bodin & Hakan, 2011; DuBois & Silverton, 2005; Herrera et.al, 2011; Karcher, 2005; Langout, Rhodes & Osborne, 2004; Lee &Cramond, 1999; Rhodes, Haight &Briggs, 1999; Rhodes, Reddy & Grossman, 2005; Whitney, Hendricker & Offut, 2011). Findings also tell us that mentoring decreases depressive symptoms in youths (DuBois &Silverton, 2005; Whitney, Hendricker & Offut, 2011).

Apart from the mere existence of mentors, empirical findings show that students, who have good mentoring relationship tend to demonstrate positive life perspectives (Wikeley, Bullock, Muschamp & Ridge, 2007). Findings coincide with Colemanôs (1988) notions of forms of social capital. Mentoring relationship characterized by emotional closeness and long duration are positively associated with psychological outcomes of mentees (DuBois & Neville, 1997; Whitney, Hendricker & Offutt, 2011). A meta-analysis also shows that mentoring tends to be more effective in enhancing psychological outcomes when mentors are advisers who provide informational support (DuBois et al, 2011). Last, mentors who offer guidance and advice also

foster positive future expectations of mentees (Greeson, Lynn & Grinstein-Weiss, 2010). Based on these research findings, this dissertation goes beyond investigating the mere effects of mentoring and hypothesizes that mentoring relationship has a direct positive effect on the change in the psychological health of youths living in poverty (Hypothesis 3.1).

2.3.2.2. The Indirect Effect of Mentoring on Psychological Health via Natural Social Relationships

I also examine whether or not mentoring creates bonding social capital through improving parent-child, family and peer relationships, which in turn enhances the menteesôpsychological health. As mentioned, bonding social capital is resources accessed through people of similar characteristics (Kawachi, Subramanian & Kim, 2008). To investigate whether or not menteesô positive natural social relationships facilitate positive outcomes (Coleman, 1988, Lin, 2001), I first examine the direct positive effects of these natural social relationships on youthsô psychological health (i.e., Hypothesis 3.2). Then, I look at the mediating roles of these natural social relationships on the positive effect of mentoring on psychological health (i.e., Hypothesis 3.3) to generate additional empirical evidence supporting that mentoring creates the bonding social capital.

Literature on the benefits of social relationships shows that positive parent-child relationship are associated with high levels of self-efficacy (Whitbeck, et al., 1997), and poor parent-child relationships result in high levels of depressive symptoms (Elder, Conger, Foster & Ardelt, 1992; Conger, et al, 2002). For family relationships, those who reported higher emotional closeness with their families are found to have higher self-esteem (Bell, Avery, Jenkins, Field & Sheonrock, 1985) and lower depressive symptoms (Dressler, 1985; Lindsey, Joe and Nibbett, 2010). For peers, having friends to count on enhance the positive developments of children

growing up in poverty (Percy, 2003; Ngai, Ngai, Chan & To, 2008). Early adolescents who indicate having more people in their networks demonstrate higher levels of self-worth (McMahon, Felix & Nagarajan, 2011). Having high peer status also protects youths from developing depressive symptoms (La Greca & Harrison, 2005). Finally, high school students in Mainland China who have larger social networks have lower levels of loneliness (Liu & Chen, 2003).Based on these findings, hypothesis 3.2 was formulated: Different types of natural social relationships have direct positive effects on the change in the psychological health of youths living in poverty.

The examination of the mediating role of parent-child, family and peer relationships on psychological health provide further evidence that mentoring creates bonding social capital and such social capital in turn enhances positive outcomes. Studies show that mentoring facilitates interactions among family members and improve adolescentsôpeer connectedness, peer acceptance and perceived peer support (Rhodes, Reddy & Grossman, 2005; Langout, Rhodes & Osborne, 2004; Karcher, 2005). Rhodes, Reddy and Grossman (2005) find that mentoring enhances global self-worth through the indirect effect of improved parental relationships. Based on these empirical findings, I hypothesize that natural social relationships mediate the positive effects of mentoring on the psychological health of youths living in poverty.

2.3.2.3 Identifying the Types of Social Resources Embedded in Mentoring relationship

The conceptualization of mentoring as a social capital intervention to foster youthsô psychological health further guides us into asking the research questions on what are the different types of social resources in mentoring relationship and how they are associated with different psychological well-being of youths. In the following, I discuss the use of Stress Buffering

Hypothesis and Strengths of Weak Ties Theory to conceptualize the types of social resources found in positive mentoring relationship.

Stress Buffering Hypothesis. The Stress Buffering Hypothesis is used to discuss the kind of social resources embedded in mentoring relationships that are conducive to lowering levels of depression in youths. Based on the notion that stress is the central organizing principal between childhood poverty and depression (See Section 2.2.1), this theory indicates that companionship reduces stress and facilitates emotional regulations, thus, decreases depressive symptoms. According to the Stress Buffering Hypothesis (Cohen & Wills, 1985), individuals with desirable social relationships tend to appraise their stressors as less negative and identify more coping resources when they encounter challenges.

The theory tells us that social relationships (e.g., mentoring, parent-child, family or peers) can relieve peopleøs stress with the following social supportive functions: companionship and diffusion of attention to problems. Companionship provides individuals with the feeling of being loved, trusted and cared. People tend to evaluate their stressors as less threatening through being accepted by significant others. Diffusing attention also reduces stress by using companionship to distract individuals from worrying about their problems. As mentioned in Section 2.2.1, stress levels is associated with psychological outcomes, hence less stress implies better psychological wellbeing. Following the Stress Buffering Hypothesis and existing findings, it is assumed that the social resources of companionship improves the positive affect or of youths living in poverty. This assumption was explored in the qualitative part of this study (See Table 2.1).

Strengths of Weak Ties Theory. The Strength of Weak Ties theory is used to discuss the kind of social resources embedded in mentoring relationships that are conducive to enhancing levels of self-efficacy in youths. Granovetterøs Strengths of Weak Ties

Theory (1973) suggests that establishing relationships with people outside of oneôs own social circle increases individualsôaccess to a variety of social resources. According to this theory, new social resources are often embedded in weak relationships rather than strong ones (Granovetter, 1973). Individuals who share weak ties tend to have dissimilar social circles, inheritable characteristics or experiences. Hence, the people they know and the resources they have tend to be very different.

Referring back to the Self-Efficacy Theory (Bandura, 1977), social persuasion in form of advice and expectations, and vicarious experience of role modeling are social resources found in weak ties. Given that youths from low-income families tend to have busy parents or parents with low level of education, they may not be able to receive the necessary support which can improve their self-efficacy (Bandura, 1977; Wigfield & Eccles, 2000). Having relationships with significant adults (e.g. mentors) outside of their social circles may increase the youthsôaccesses to novel social resources. Mentors can provide their mentees with role modeling, advice and expectations to enhance their self-efficacy (Bandura, 1977; Wigfield & Eccles, 2000; DuBois, et al., 2011). Following the Strengths of Weak Ties Theory, Self-Efficacy Theory and existing literatures, it is assumed that advice, expectations and role modeling can promote the self-efficacy of youth living in poverty. This assumption is explored in the qualitative part of the study (See Table 2.1).

2.3.2.3. Operationalization and Measurement of Social Capital

As for the measurement of social capital, I adopt a network based approach to operationalize social capital (Lin, 2001). Social networks are the structures of social relationships (Valente, 2010), and social capital is an inherent property of social relationships (Lin, 2001; Lakon, Godette & Hipp, 2008). Considering the close associations between these constructs, it

makes sense to measure social capital as individualsôaccess to social resources through his or her social networks (Lin, 2001). To evaluate individualsôaccess to social capital, measures of size, strength of ties, heterogeneity and is commonly used (Borgatti, Jones & Everett, 1998).

Network size refers to the number of people in a network (Valante, 2010), and strengths of ties refers to the quality of relationships shared among network members (Valente, 2010). For network heterogeneity, it refers to the degree of dissimilarity in terms of attributes among network members (Marsden, 2011). Last, network density refers to the ratio between the actual ties and all possible ties in a network. The higher the density score, the more connected a network. Network with higher density tend to have faster flow of information than a spare network (Luke & Harris, 2007).

In this dissertation, the network measures of the strengths of ties is used to evaluate the levels of social capital in mentoring and parent-child relationships, and network size is used to measure the social capital in family and peer networks. I do not use the measures of heterogeneity and density, because these indexes are commonly used to measure social capital that directly facilities social mobility or opportunities rather than psychological health (Borgatti, Jones & Everett, 1998).

For the operation definition of strengths of ties, as suggested by Coleman (1988), relationships that are trustworthy and contains valuable information is social capital. Hence, both strong mentoring relationship and parent-child relationship are operationalized as high level of emotional closeness between the mentees and their mentors and parents respectively. Because literature also suggests that mentors play advisor role (DuBois et al, 2011; Greeson, Lynn & Grinstein-Weiss, 2010), therefore, the operational definition of a good mentoring relationship

further expands beyond emotional closeness to the availability of the resources of advice in mentoring.

Because family relationships and peer relationships can extend beyond dyadic interactions, the quantitative part of this dissertation uses social network size to evaluate the level of social resources available to the youths (Lin, 2001). Social network size refers to the number of people that youths can count on when facing difficulties. Research on social network demonstrates that the larger a person social network size is, the higher level of emotional support he or she receives (Tracy, 1990). In addition, as mentioned earlier, youths who have more friends to count on tend to have better psychological health (Percy, 2003; Ngai, Ngai, Chan & To, 2008 ;McMahon, Felix & Nagarajan, 2011). As such, I use family network size and large peer network size to measure the level of social capital in menteesô family and peers relationships (Lin, 2001).

2.3.3. Hypotheses and Research Questions

Based on the Social Capital Theory and related empirical findings, the following hypotheses were formulated. **Hypothesis 3.1.** Mentoring relationship has a direct positive effect on the change in psychological health of youths living in poverty. **Hypothesis 3.2.** Natural social relationships have direct positive effects on the changes in the psychological health of youths living in poverty. **Hypothesis 3.3.** Natural social relationships of parent-child, family and peer mediate the positive effects of mentoring on psychological health. These hypotheses were tested in the quantitative part of the study.

I also generated the following research questions: **Research Question 3.1**. What are the positive psychological and social outcomes experienced by the mentees after participating in the mentoring program? **Research Question 3.2** What kind of social resources are embedded in mentoring? **Research Question 3.3.** How are these resources associated with different types of

psychological health? These research questions were answered in the qualitative part of the study. Based on the Stress Buffering Hypothesis, Strengths of Weak ties Theory and Self Efficacy theory, the following broad categories are established as the guiding principle for the qualitative part of this aim (Table 2.1.).

Table 2. 1 Definitions of Categories

Categories	Definitions
Improvement in psychological outcomes	
Positive Affect	Menteesô indication of feeling happier or lower levels of negative feelings after mentoring.
Self-Efficacy	Menteesô indication of feeling better about themselves and their abilities to resolve problems after mentoring.
Improvement in existing relationships	
Peers	The changes in the quality of peer relationships and the number of friends they have after mentoring
Family	The changes in the interaction with family members after mentoring
Bonding Social Capital in parent-child, family and peer relationships	
Companionship	The activities mentees share and do together with their friends and family, and to what extent is it related to the changes in the psychological health and social relationships of the mentees.
Bridging Social Capital in Mentoring	
Companionship	The activities that mentors and mentees share and do together, and to what extent is it related to the changes in the psychological health and social relationships of the mentees.
Advice	The advice that mentors offer to their mentees that change the psychological health and social relationships of the mentees.
Expectations	Mentorsô indication on whether or not their mentees fulfilled their expectations.
Role Modeling	Menteesô indication of what they have learnt from observing their mentors and listening to their mentorsô successful stories. Mentors indication of what they share with their mentees and their personal lives.

Chapter 3. Research Methodology

The purpose of this chapter is to discuss the research methodology applied to achieve the three major research aims in this dissertation. The aims of this dissertation are: **1)** To operationalize childhood poverty in Hong Kong; **2)** To examine the psychological consequences in childhood poverty; and **3)** To explore how mentoring promotes the psychological health of the youths living in poverty (Figure 2.1). The research plan is intended to test the theoretical framework proposed in Chapter 2, and at the same time, uncover new ideas associated with mentoring.

3.1 Methods Overview

Considering that this dissertation contains three different research aims, various research designs are adopted: cross-sectional quantitative design, longitudinal quantitative design, and mixed methods research design. Different types of data collection and analysis are used to address each aim (Table 3.1).

Table 3. 1. Summary of the research designs, data collection and data analysis

	Research Design	Types of Data	Data Analysis
Aim 1: To operationalize Childhood Poverty in Hong Kong.	Cross Sectional Quantitative Design	Secondary quantitative self -report survey data	Latent Class Analysis
Aim 2: To examine the psychological consequences of Childhood Poverty	Longitudinal Quantitative Design	Secondary quantitative self- report survey data	Multilevel Modeling
Aim 3: To explore how mentoring promote the psychological health of the youth in poverty.	Mixed Methods Design	Secondary quantitative self-report survey data One on one in depth interviews	Multilevel Modeling Thematic Analysis (Theory Driven) Parallel Mixed Analysis

3.2 Program Participants / Study Sample

Data were obtained from two sources: a quantitative secondary longitudinal data set from the Child Development Fund Program and a primary qualitative data set from a School Based Problem Solving Skills Mentoring Program in Hong Kong. Participants were of two separate groups of adolescents. For the participants in the Child Development Fund Program, most were locally born adolescents living in poverty ranging from 10 to 16 years old. For the School Based Mentoring Program, most participants were born in Mainland China, and were considered new arrivals in Hong Kong, ranging between 14 and 18 years old. The quantitative data was used to achieve the first two aims of the study. Both quantitative and qualitative data were employed to address the third aim. In the following, there comes firstly the description of the participants involved in the Child Development Fund Project, followed by those in the School Based Mentoring Program.

3.2.1. Quantitative Data: Child Development Fund Project

The quantitative strand of this study is part of the larger evaluation project of the Child Development Fund Program (CDF). This program is funded by the Hong Kong Government aiming to support the long term development of youths living in poverty. The program is a multicomponent program, which consists of mentoring, target savings and personal goal settings. Mentors are encouraged to assist their mentees in accumulating savings in the first two year of CDF to achieve their personal goals in the third year of the program. The monthly saving target is 200 HKD, and the government invites business sector or individuals a 1:1 matching contribution for the savings accumulated. For each completed targeted savings, the government provides an additional 300 HKD as incentive. In addition, mentors are also encouraged to offer guidance to help their mentees strengthen existing relationships with their families and friends.

The Network of Health and Welfare Studies at the Hong Kong Polytechnic University was selected as the organization managing and evaluating the program. Table 3.2 (column A) provides a description of this mentoring program. The program consisted of 750 participating mentees from seven different districts in Hong Kong, namely, Hong Kong Island (n=100), Kowloon East (n=100), Kowloon West (n=120), New Territories East (n=110), New Territories West (n=120), Tung Chung (n=100), and Tin Tsui Wai (n=100). Youths participating in CDF needed to be either: i) living in families that receive Comprehensive Social Security Assistance (CSSA); ii) from families having household income less than 75% of the Hong Kongôs median household income; or iii) receiving full grants from student finance schemes administered by Student Financial Assistance Agency at the time of the recruitment. Young people demonstrating serious deviant behaviors were excluded from the program because mentors might not have sufficient training to provide guidance for these young people.

With regard to this dissertation research, I am interested in understanding the psychological health of mentees involved in the Child Development Fund Program. Out of the 750 participating mentees, 292 were males and 458 were females, with mean age of 13.83 at enrollment. The majority of the participants were permanent residents of Hong Kong, with 12% of them as non-local residents. Forty-five percent of the participants lived in families receiving social security, and approximately 40% of them were only living with one parent. For housing type, approximately 88% of them dwelled in rented housing, and 61.3% lived in families in which at least one of the parents did not have full time employment. For parental education level, approximately 51% of them did not complete lower secondary school.

Table 3. 2. Brief Summary on the Mentorship Program of Child Development Fund and Problem Solving Skills Training and Mentorship Program for Adolescents

	Mentorship Program of Child Development Fund (Column A)	Problem Solving Skills Training and Mentorship Program for Adolescents (Column B)
Organizers	The program is funded by the Government of the Hong Kong Special Administrative Region. The Network for Health and Welfare Studies at the Hong Kong Polytechnic University was selected as the partnering institution in charge of managing and evaluating the program.	The program was jointly organized by the Centre for Suicide Research and Prevention at the University of Hong Kong and a local Secondary School in Hong Kong.
Duration	Three Years (February 2009 to May 2012)	Nine months (Jan 2013-October 2013)
Program Context	Community based, government initiated, co-organized with seven non-profit organizations	School based, initiated by the University of Hong Kong, jointly organized with a local school
Program Goals	Apart from the mentoring, the program also consist of a target saving and personal goal settings component. Mentors were required to assist their mentees to set up personal goals that their mentees wanted to achieve, and motivated them to save up money so that the mentees would have resources to fulfill their goals by the end of the mentoring program.	Mentors were required to train the mentees to use adaptive ways to resolve their personal problems.
Expectations from the Mentors and Mentees	• Mentors and mentees were expected to participate in activities beneficial to the personal development of the mentees. These activities could be organized by the mentors or operating non-profit organizations over the course of the program. • Though not mandatory, mentors and mentees were expected to contact each other on a regular basis.	• Mentors and mentees were required to attend six mandatory problem solving skills training sessions conducted by a mental health counselor at the University of Hong Kong • Mentors and mentees were expected to meet regularly and carried out at least three recreational activities together.

Table 3.2 (Continued) Brief Summary on the Mentorship Program of Child Development Fund and Problem Solving Skills Training and Mentorship Program for Adolescents

	Mentorship Program of Child Development Fund (Column A)	Problem Solving Skills Training and Mentorship Program for Adolescents (Column B)
Menteesô characteristics and selection criteria	• Participants (n=750) were between 9.3 and 16 years old, studying between Grade 4 and Grade 10. • Participants needed to be either: i) living in families that receive Comprehensive Social Security Assistance (CSSA); ii) from families having household income less than 75% of the Hong Kongôs median household income; or iii) receiving full grants from student finance schemes administered by Student Financial Assistance Agency at the time of the recruitment. • All participants were referred by the collaborating seven local non-profit organizations (NPOs)[2].	• Participants were between 14 and 18 years old, studying between Grade 8 and 9. • Participants were those from low-income families identified by the participating school. • All participants were referred by the participating school.
Mentorôs characteristics and selection criteria	Training was provided to interested mentors, through which eligible mentors were elected . Mentors who demonstrated the following qualities were selected: • Good communication skills • Good attendance • Extensive social networks Mentors (n=750; Male=225; Female =382; Missing 143) aged between 18 and 65 years old.	Applicants were interviewed and selected mentors were required to attend 5 training sessions prior to meeting their mentees. Mentors who demonstrated the following qualities were selected: • Having experience in working with adolescents, Demonstrating good communication skills and willing to make committment Mentors (n=23; Male=10; female=13) were between 20 and 60 years old.

[2] Baptist Oi Kwan Social Service, Christian Action, Industrial Evangelistic Fellowship, Tung Wah Group Hospital (New Territory East), Hong Kong Federation of Youth, Hong Kong Sheng Kung Hui Welfare, and Tung Wah Group (Tin Shui Wai)

3.2.2. Qualitative Study: The School Based Problem Solving Skills Mentoring Program

The qualitative strand of this study is based on the School Based Problem Solving Skills Mentoring Program jointly organized by the Centre for Suicide Research and Prevention at the University of Hong Kong and a local secondary school in Hong Kong. Assuming that youth living in poverty tend to encounter higher levels of stress and difficulty, this mentoring program aims to help these young people by training them to handle problems through mentoring. Table 4.2 (column B) provides a description of this mentoring program.

The program consisted of 26 mentees (female=16, male=10) and 23 mentors (female=13, male=10). Because there were not enough mentors, three of the more experienced mentors were matched with two mentees instead of one. Mentors were recruited via invitations through the internal email system of the University. As such, only current students or alumni of the university received the invitation. Those interested in being a mentor of the program were asked to submit an application and went through interviewing process. Adults, who had experience in working with adolescents, demonstrated good communication skills and were willing to make commitment, were selected to participate. Among the recruited mentors, 3 were graduate students at the University of Hong Kong, and 2 were undergraduates, others were all alumni of the University.

Mentees were recruited through the teachers in charge and the social workers at the participating school. All participants needed to be from low-income family. Students who were interested in the program had to submit a statement describing why they wanted to join the program. All students who applied were selected. Participating mentees were aged between 14 and 18 years old (mean age=15.8). Five of the mentees were locally born in Hong Kong, while

the others were all new arrivals from Mainland China. Students who joined the program tended to have poor relationships with their families, small social circles, low motivations, low self-confidence or anger management issues.

With regard to the sample size of this dissertation research, a total of 15 mentors (female=9; male=6) and 23 mentees (female=14, male=9) participated in the qualitative research. Mentors (n=8) who did not participate in the interviews indicated that they were too busy. All participating mentors, with age ranged between 22 and 60, were either graduate students at the University of Hong Kong (n=3) or professionals graduated from the University (n=12).

Mentees were between 14 and 18 years old, studying in either grade 8 and 9. The majority of them were new arrivals from Mainland China (n=19) and the remaining (n=4) were born in Hong Kong. One of the interviews was terminated 15 minutes after the start of it because the mentee started talking about her personal issues which was clearly bothering her. Considering that this participant was bothered by her own personal problems and did not seem to be suitable for being interviewed, I decided to terminate the interview. On that occasion, I was not able to contact three of the mentees because they had left school by the time of the interview.

3.3 Data Collection

Quantitative data was used to achieve Aim 1, 2 and 3 of this dissertation, and qualitative data was used to achieve aim 3. Data of the quantitative study was collected through self-report surveys administered between February 2009 and May 2012 by the Network of Health and Welfare Studies prior to the start my dissertation. Qualitative data was collected through one on one interview between September 2013 and February 2014 conducted by myself and a research assistant hired by the University of Hong Kong. Qualitative information was used to achieve

Aim 3 of this dissertation. The following describe the data collection process of the quantitative data followed by the qualitative data.

3.3.1. Quantitative Data (Aim 1, Aim 2 and Aim 3)

Data used in this current study was collected through the operating non-profit organizations partnering with the Network on Health and Welfare Studies over a 40 month period between February 2009 and May 2012 (Table 3.3). IRB approval was obtained from the Human Subjects Ethics Subcommittee at the Hong Kong Polytechnic University before the data collection process. Informed consents were also obtained from the participants and their parents. Before I began managing and analyzing the data, the Human Research Protection Office at Washington University in St Louis also granted a waiver for me to carry out the study (Appendix A).

Table 3. 3 Time line for the Data Collection of the Child Development Fund Program

Progress of the project	Year	Period	Fieldwork
First Year	2009	Feb 14-Apr 30	Round 1 survey
		Aug 1-Nov 10	Round 2 survey
Second Year	2010	Feb 1-May 7	Round 3 survey
Third Year	2011	Mar 9-May 31	Round 4 survey
	2012	Jan 19-May 9	Round 5 survey

Recruitment of participants. Participants were recruited through seven non-profit organizations in Hong Kong. Convenience sampling was used to collect the data. The partnering non-profit organizations recruited participating youths from three sources: school, community and church networks. The non-profit organizations had developed relationships with the local

schools, as such, it was easy for them to mobilize the local schools to offer assistance in the recruitment process. Recruitment at schools was done through information sessions and leaflets. Interested and eligible students were encouraged to apply to the program through their school social workers. The non-profit organizations also established connections with community organizations and religious groups were established through the Social Welfare Department in Hong Kong. Recruitment at community organizations and religious groups was done through promotions at community and church activities, briefing sessions and leaflets.

Collecting the Quantitative Data: Self-report Survey. The Network on Health and Welfare Studies used different data collection approaches through the course of the study. In round 1, 2 and 3, participating mentees and their parents were asked to fill out the survey when they had attended mentoring-related activities via the partnering non-profit organizations. All surveys were self-reported. For those who did not attend the activities, research members of Network on Health and Welfare Studies interviewed them by telephone or in person at the partnering non-profit organizations. For some participants, surveys were mailed to them. In round 4 and 5, questionnaires were sent to the participantsô home address with stamped envelopes for them to mail the surveys back to the research center.

With regard to the current dissertation, self-report information on menteesô psychological health, social support networks, mentoring relationship and parent-child relationship at each data collection round were used. Personal demographics, of gender and age, were obtained during baseline. Their parents were asked to provide information regarding their familial backgrounds, which included parental education level, parental employment status, whether or not the family received social security, housing type and family configuration at baseline. The response rate of

the survey was: Round 1 = 521 respondent; Round 2 = 572 respondents; Round 3 = 567 respondents; Round 4 = 528 respondents and Round 5 = 437 respondents.

3.3.2. Qualitative Data (Aim 3)

Data used in this qualitative strand of the study was collected through one on one in-depth interview with participating mentors and mentees. IRB approval was obtained from the Human Research Ethics Committee for Non-Clinical Faculties at the University of Hong Kong. Washington University in St Louis also granted an IRB waiver to the qualitative part of this dissertation (Appendix 3.1). All participants, both mentors and mentees, were invited to participate in the interview at the end of the mentoring program. The timing of the interviews allowed me to gain information on the mentorsô and menteesôperceptions on their dyadic relationships, as well as how mentoring change the psychological health and social relationships of the mentees. Interviews with the mentors included questions about their interactions with their mentees, and their perception on the changes in the psychological health and social relationships of their mentees. Interviews with the mentees included questions about their interactions with their mentors, their changes in their psychological health and their relationships with their peers and families.

Recruitment of Participants. All participants, mentors and mentees, in the mentoring program were invited to join the qualitative research. Convenience sampling was used to collect the information. Participating mentors were asked if they were willing to be interviewed towards the end of the study. After mentors expressed their interests in it, arrangements were made to meet the mentors at the University of Hong Kong in order to have them provide written consent and conduct the interview process.

For the mentees, verbal invitations to participate in the qualitative interviews were sent to them through the school teacher in charge of the mentoring program. Mentees who expressed interests to be interviewed were given passive consents to notify their parents about their participations in the study. If their parents did not express objections, arrangements were then made to interview the students at their schools. After written consents were obtained from the students, the interview process began.

I came into contact with all participants, both mentees and mentors, in the middle of the mentoring program. At one of mentor-mentee gathering sessions, I asked each participating mentor and mentee whether or not they wished to be interviewed. During this initial conversation, participants received information about the time commitment and questions that would be asked in the interview. At that stage, all participating mentors and mentees agreed to be interviewed. As such, arrangements were made by phone to meet the mentors. As for the mentees, the teacher in charge of the mentoring program at the school helped arrange the interviews. Before the interviews began, all remaining questions were answered and written consent was obtained before the interviews.

Collecting the Qualitative Data: One on one in-depth interviews. After written consent was obtained from both mentors and mentees and passive consent from the menteesô parents, initial interviews with the mentors and mentees were conducted. Mentors and mentees were interviewed separately. Interviews with the mentors were conducted at the University of Hong Kong, which lasted between 60 and 90 minutes. Interviews with the mentees were carried out at their school, which lasted between 20 minutes and 60 minutes. The locations of the interview were quiet so as to facilitate a sincere talk. All interviews were conducted by two interviewers and were audio-taped.

3.4. Measurements

This section is organized according to each aim in this dissertation. The measurements used for each aim are described below.

3.4.1. Aim 1. Operationalize Childhood Poverty in Hong Kong

The following familial socio-economic indicators were used to achieve Aim 1 of this dissertation. Information on these family socio-economic indicators was obtained from parents of mentees participating in the Child Development Fund Program. Baseline information was used to conduct latent class analysis for this aim. Variables used were family welfare status (binary), home ownership (nominal), parental education level (nominal), parental employment status (nominal) and family figuration (binary). The nominal variables of parental education level, parental employment status and home ownership were grouped into binary variables for the purpose of latent class analysis (See section 3.6.1). The re-categorizations were grounded in previous literatures and the social context of Hong Kong. Results of the latent class analysis using the following observed socio-economic variables created a new latent variable, *childhood poverty*, which were used to achieve Aim 2 and 3.

Family Welfare Status. Family welfare status was obtained from official records provided by Network on Health and Welfare Studies indicating whether or not the families were receiving social security at baseline. For the rationale of using this indicator as substitute of household income, please refer to Chapter 2 of this dissertation. This variable of family income status was a binary variable, with ñ1ò =receiving social security, and ñ0ò= not receiving social security.

Homeownership. This variable was a 5 level categorical variable: 1=Rented Public Housing; 2 =Rented Private Apartment; 3=Rented Private Suite; 4= Temporary Housing;

4=Privately Owned Public Housing; 5=Privately Owned Housing. I decided to collapse this variable into ñ1ò= Living in rented housing; ñ0ò= Not living in rented housing. According to the Poverty Situation Report (2012), approximately 61.7% of people living in poor households lived in rented housing. Considering the large percentage, it made sense to use familial home-ownership as an indicator of childhood poverty.

Parental Education Level. The variable of parental education level originally had 7 categories (0= Kindergarten; 1= Primary school; 2=Lower secondary school; 3 =Middle secondary school; 4=Upper Secondary School; 5= Diploma, 6= College; 7= Postgraduate). This variable was recoded into binary level to fit the data analysis plan of latent class analysis. The challenge was to identify the cutoff point that could be used to reflect childhood poverty. A review on the literature suggested that having parents who did not completed high school was used as a common poverty threshold in the United States (e.g., Eamon, 2001; DuBois, feline, Meares & Krier, 1994). However, owing to the specific social context of Hong Kong, this cut off might not be relevant. Another way to identify the cut off was whether or not the parents still received education beyond minimum schooling age (Langton et al., 2011). This cut off point tended to be more grounded as it was related to the specific social context in Hong Kong. In Hong Kong, the minimum age for leaving school is 15 years old, which is equivalent to lower secondary school level. Therefore, this variable was recoded as ñ1ò= Lower secondary school or below, and ñ0ò= Attended Upper secondary school education, in order to represent childhood poverty. The decision was further supported by the fact that 53.8% of the people from poor households in Hong Kong had lower than secondary level education (Census and Statistics Department [HKSAR], 2012).

Parental Employment Status. Parental employment status was a 5 level categorical variable: 1=employed in full time job; 2=unemployed job seekers; 3=unemployed non-job seekers; 4=unemployed chronically ill; 5=employed in temporary or part time job. Again for the purpose of data analysis, this variable was dichotomized. As such, I collapsed it as ñ1ò= Unemployed, 0= ñEmployedò to reflect parental employment status. Because parental employment status was largely tied with household income level, it made sense to categorize this variable in such a way to represent childhood poverty.

Family Configuration. This variable was originally coded as a binary one, ñ1ò= living with single parents; ñ0ò = Living with both parents. The review of the literature repeatedly showed that youths living in single parent family tended to live in low-income households (Brown, 2004; Eamon, 2001; DubBois et al., 1994; Langton et al., 2011). Censes data of Hong Kong also showed that low-income households were largely represented by single parent family (Census and Statistics Department [HKSAR], 2011). Considering this, I decided to use ñLiving with single parentsò as a cut-off point of childhood poverty in my dissertation.

3.4.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty

In order to achieve aim 2, the variables of psychological health and time, having encountered family financial difficulty, parental perceived economic pressure and the latent variable of childhood poverty, created in Aim 1, were used. The outcome of interest was psychological health measured by the *Chinese Version of General Health Questionnaires*. Participating mentees were asked to provide information on their psychological health in Round 1, Round 3, Round 4 and Round 5 of data collection. The psychological measure of General Health Questionnaires was not included in Round 2 because the data in Round 1 and 2 occurred in the same year. Such a decision was made by Network on Health and Welfare Studies as the

organization in charge of the data collection process. The Network on Health and Welfare Studies decided to omit this measure in Round 2 of the data collection process as changes in psychological health was not expected to occur in such a short period. Independent variables were time, family financial difficulty, parental perceived economic pressure and childhood poverty.

Dependent Variable: Psychological Health. The *Chinese Version of the General Health Questionnaires-12* (GHQ; Li, Chui, Chung & Chan, 2009) was adopted to capture the outcome variable of psychological health. The scale consisted of 12 items and participants were asked to rate their responses on a 4 point likert scale (ñ1ò= much more so than usual to ñ4ò= much less than usual) (Appendix B).

The total score, ranging from 12 to 48, was generated by summing up all items. A higher total score reflected better psychological health. The scale demonstrated construct validity with a two-factor solution, ñsocial dysfunctionò and ñanxiety/depressionò, with confirmatory factor analysis used (Li et al., 2009). A closer examination of items in the factor of ñsocial dysfunctionò showed that they actually reflected the self-efficacy and self-confidence of the participants. As such, this scale was used to measure the variable of psychological health in this dissertation.

The GHQ also demonstrated satisfactory internal consistency with a group of Hong Kong adolescents (Cronbach alpha = 0.87) (Li et al., 2009). With regard to the current sample, the scale also achieved satisfactory internal consistency in Round 1, 3, 4 and 5. Cronbach alpha values were as follows: Round 1 = 0.79, Round 3 = 0.81, Round 4 = 0.83, and Round 5 = 0.83.

Independent variable: Index of Time. In order to examine changes in psychological health overtime, the index of time was used as a independent variable. ñRoundsò, which

indicated when the five rounds of survey were collected, provided a basis for the formulation of the time variable (Table 3.4).

Because the data collection process for Round 2, 3, and 5 took more than 3 months, I decided to split each of these rounds into separate time points, with each time points lasting for two months. Such a decision was made as the psychological and social outcomes of developing youth changed frequently, therefore, it was expected that their psychological and social outcomes might change even within each data collection round. Round 1 was not divided into smaller time points because the data collection date was not available for this round. Round 4 was retained because the data collection process of these rounds last exactly two months. A new variable ñTimeò was created and was used as the variable indicating the index of time (Table 3.4).
It is important to note that because data in rounds 2, 3 and 5 were separated into smaller time points, the total number of observations in each of these rounds was spread across each time point.

Table 3. 4 Number of observations available at each time point corresponding to each round of data collection

Year	Basis for Index of Time (Rounds)			Newly Created Time Variable(Time)		
	Data Collection	**Months**	**No. of observations**	**Index of Time**	**Months**	**No. of observations**
2009	Round 1 survey	Feb, Mar & Apr	521	Time 0	Feb, Mar& Apr	521
	Round 2 survey	Aug , Sept Oct & Nov	572	Time 1	Aug & Sept	485
				Time 2	Oct & Nov	87
2010	Round 3 survey	Feb, Mar & Apr, May	567	Time 3	Feb & Mar	301
				Time 4	Apr & May	266
2011	Round 4 survey	Apr &May	528	Time 5	Apr & May	528
2012	Round 5 survey	Mar, Apr & May	437	Time 6	Feb & Mar	339
				Time 7	Apr & May	98

Independent Variables: Financial Difficulty Encountered by Families. The variable of ñhaving encountered financial difficultyò was captured by a single question asking parents to indicate whether or not their families had encountered any situation that led to financial difficulties. A response of ñnoò was coded as ñ0ò. A response of ñyesò was coded as ñ1ò.

Independent Variables: Parental perceived economic pressure. The variable of parental perceived economic pressure was captured by a single follow up question, ñHow much does the situation impact on the financial condition of your family?ò Parents were asked to indicate their responses from ñ0ò=None to ñ3ò=Very large. If the respondents indicated that their families had not encountered any financial difficulties, then, their response would be coded as ñ0ò. In order to differentiate those who felt highly pressured from those who were not, this variable was re-categorized into a binary variable: ñ1ò=Very high economic pressure versus ñ0ò= Not very high economic pressure.

3.4.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty

To achieve this aim, both quantitative and qualitative data were used. For quantitative data, in addition to the variables used in Aim 2, four variables were employed: mentoring relationship, parent-child relationship, peer network size and family network size. Qualitative data were collected using one on one in-depth interviews. In the following, I first discussed the quantitative measurements, followed by qualitative measurements.

Quantitative Measurements. Mentoring relationship and parent child relationships were measured by the self-designed *Mentoring relationship Questionnaires* constructed by Network of Health and Welfare Studies and the standardized scale of *Relatedness Questionnaire with*

parents respectively. While information on parent-child relationship was collected at all rounds of data collection, information on mentoring relationship was collected between Round 2 and Round 5. Information on mentoring relationship was not collected during baseline because it was not available before the start of the mentoring program. Family and peer social network size were assessed by asking participating mentees to indicate the number of family members and peers they would talk to when they were upset. This information was collected at all rounds of data collection.

Independent variable: Mentoring relationship. The *Mentoring relationship Scale* was used to evaluate the quality of mentoring relationship between the participating youth and their mentors (Appendix B). This scale consisted of 39 items, which were adapted from four standardized mentoring instruments: Youth Mentoring relationship Scale (Rhodes, Reddy, Roffman, & Grossman, 2005), Youth Survey (YS; PPV/Public Private Venture, 2002), The Relational Health Indices ï Mentor Subscale (Liang, Tracy, Taylor, & Williams, 2002), and Mentoring Scale (Darling, Hamilton, Toyokawa, & Matsuda, 2002).

The *Mentoring relationship Scale* comprised seven subscales, which were ñYouth-centered relationshipsò, ñPositive emotional engagementò, ñNo negative emotional engagementò, ñTrustò, ñPsychological proximity seekingò, ñHelp to copeò and ñEmpowerment and performance standardò. The first 17 items had a 4 point likert response scale: Out of these 17 items, 15 of them adopted response items as follows: ñ1ò=Not True at all; ñ2ò=Not very true; ñ3ò=True; ñ4ò=Very True. The remaining four items (i.e., Item 14 to 17) employed response items as: ñ1ò=Never, ñ2ò= Seldom; ñ3ò=Sometimes; and ñ4ò=Always. For items 18 to 39, a 5 point likert scale was adopted, with ñ1ò= Never; ñ2ò=Seldom; ñ3ò=Sometimes; ñ4ò=Often and

ñ5ò=Always. The total score was generated by adding up all the items, ranging from 36 to 162 points.

The reliability of this scale was tested by using confirmatory factor analysis with data collected in Round 2, Round 3 and Round 4 of the project (unpublished manuscript written by Network for Health and Welfare Studies). Results of the analysis supported the seven factor model, showing acceptable fit statistics (CFI): Round 2 = 0.94, Round 3=0.93, and Round 4=0.95. The scale also demonstrated high levels of internal consistency in all rounds, Cronbach alpha values were as follows: Round 2 =0.96, Round 3=0.97, Round 4=0.97, and Round 5=0.95.

The face validity of this scale was examined with the group of mentees participating in the School-Based Problem Solving Skills Mentoring Program because this scale had not been validated. Participants were asked to fill out this questionnaire towards the end of the qualitative interviews, and their responses to the survey were matched with their feedbacks on their experiences with their mentors throughout the program. Findings of this cross-validation study show that this mentoring scale had reached face validity. For details of the findings, please refer to Appendix C, Section C.1.

Independent Variable: Parent-child Relationship. The *Relatedness Questionnaire with Parents* (Lynch & Cicchetti, 1997) was used to capture parent-child relationship (Appendix B). The scale is rated on a 4 point scale (1= ñtotally disagreeò to 4= ñtotally agreeò). The scale consisted of 18 items with two factors, emotional quality and psychological proximity seeking. The scale demonstrated construct validity and satisfactory internal consistency (Lynch, 1992).

The adapted Chinese version was modified and translated by the Network for Health and Welfare Studies according to the social context of Hong Kong. Two items were deleted by the

Network for Health and Welfare Studies in the adapted Chinese version. The item, ñI wish my____ know more about how I feelò, from the original version was deleted from the scale. Another item, ñWhen I am with ____, I feel sadò, was also deleted because it contains too much negativity i. The scoring of scale remains the same, and a total score was generated by summing up all items, yielding a total score between 16 and 64. With regard to the sample used in this dissertation, the scale demonstrated satisfactory internal consistency. Cronbach alpha values were: Round 1=0.89, Round 2=0.91, Round 3=0.85, Round 4=0.91; and Round 5=0.86.

Because this scale was not validated in Chinese, the face validity of this scale was also examined. Participants of the School-Based Problem Solving Skills Mentoring Program were asked to fill out this questionnaire towards the end of the qualitative interviews, and their responses in the survey were matched with their feedbacks on their experiences with their mentors throughout the program. Findings of this cross-validation study showed that this scale had reached face validity. For details of the findings, please refer to Appendix C, Section C.2.

Independent Variable: Social Network Size. In the social network survey, respondents were asked to recall the number of people they could count on when they needed someone to talk to elicit the level of emotional social support (i.e., companionship) they received from others (Tracy, 1990). Two types of social network identified in the social network survey were used in this dissertation: peers social networks and family social networks (Appendix B).

Qualitative Measurements. In order to collect qualitative information, a general questions guide was generated to direct the interviews and prevent them from going off track. The general direction of the interview questions were theory driven and generated based on the Social Capital Theory, the Stress Buffering Hypothesis, Strengths of Weak Ties Theory and Self-Efficacy Theory (See Table 2.1). According to Wengraf (2001), qualitative studies that

employed a deductive approach should have interview questions that are more structured and theory-driven. In addition to existing theories, mentoring literatures also guided me in narrowing down the questions and making decision on the specific concepts that I wanted to focus on in the interviews. Interview questions fell into the board categories of **(1)** changes in the psychological health of mentees, **(2)** changes in peer relationships of the mentees, **(3)** changes in the family relationships of the mentees, **(4)** what kind of social resources are embedded in mentoring and **(5)** how mentoring is associated with the psychological and social changes of the mentees. All interviews were conducted by me and a research assistant from the University of Hong Kong. Interviews were lightly structured, at the same time, they were open-ended and flexible to allow the participants to provide rich information. Appendix D is a general question guide of the interview questions for both mentees and mentors.

3.5. Data Management

The following first describes the data management process of the quantitative data followed by the qualitative data.

3.5.1. Quantitative Data

All information utilized in the quantitative strand of the study was secondary data provided by the Network for Health and Welfare Studies at the Hong Kong Polytechnic University. Once the required variables were determined, a new dataset was generated by the project manager at Hong Kong Polytechnic University. All data was first de-identified, then assigned unique case identifiers, and transferred to me. The data was stored in an encrypted drive in my personal laptop protected by a password system. The project manager at Network for Health and Welfare Studies was available for regular consultation regarding the coding of variables and data collection process.

All familial socio-economic information was provided by parents of the mentees. Because the interval between Round 1 and Round 2 of the data collection period span only 6 months, parents who provided familial demographic data in Round 1 were not asked to provide similar information in Round 2. As such, I decided to combine the socio-economic data in Round 1 and Round 2 and use it as baseline information in my dissertation.

Missing Data. Considering that the data is longitudinal in nature, missingness is inevitable. In longtitudinal data sets, data with a high level of missingness, and data with missingness that is associated with participantsôrefusing to respond to a particular question, that is systematic and that is related to attrition, can cause analytic and interpretation issues in the study (Collins, Schafer & Kam, 2001). As such, I conducted a series of missing data analyses to understand the nature of missingness in the quantitative data set.

Findings of the missing analysis suggested that the data had high percentage of missingness. In addition, the missingness was non-random and was associated with attrition in the last round of data. Therefore, the reliability of the results was expected to be threatened. The full information maximum likelihood approach was used to protect against the threats.

Percentage of Missingness. Missingness in the demographic data reported by the parents could be considered relatively low in its percentage, except for parental education level, which accounted for 24% of the missing data (Table 3.5).

Table 3. 5 Percentage of Missingness in Demographic Data

	Total number of response	Percentage of Missingness
Time Invariant Variables		
Family Welfare Status	673	10.2%
Home Ownership	682	9.06%
Parental Employment Status	681	9.20%
Parental Education Level	570	24.0%
Family Configuration	678	6.40%
Family having Experienced Financial Difficulty	692	7.73%
Parental Perceived Economic Pressure	686	8.53%
Mentee Age	750	0%
Mentee Gender	750	0%

Yet, the percentage of missingness in the time-varying variables reported by the young participants was relatively high. Table 3.6 shows the percentage of missingness associated with each particular time-varying variable. Missingness in round five was highest for all time-varying variables: more that 40% of the participants did not respond to the questionnaire.

Further examination of the data showed that a total of 189 out of 750 participants responded in all five rounds of the data collection, 236 participants in 4 rounds, 163 participants in 3 rounds, 103 in 2 rounds, 41 in only 1 round, and 18 of the participants never provide any responses. Considering the low number of participants responding to all five rounds of surveys, a high level of missingness in each round of data collection was expected.

Table 3. 6 Percentage of Missingness in Variables Used

Variables	% of Missing Response	Total number of participants responding to a particular questionnaire	Total number of response in each round
Time Variant Variables			
General Psychological Health (GHQ)			
GHQ Round 1	31.40%	514	521
GHQ Round 2		Na	572
GHQ Round 3	26.80%	549	567
GHQ Round 4	30.80%	519	528
GHQ Round 5	42.60%	430	437
Peer Network Size			
Peer Network Size Round 1	30.6%	520	521
Peer Network Size Round 2	24.9%	563	572
Peer Network Size Round 3	25.6%	558	567
Peer Network Size Round 4	30.4%	522	528
Peer Network Size Round 5	42.6%	430	437
Family Network Size			
Family Network Size Round 1	30.5%	521	521
Family Network Size Round 2	24.1%	569	572
Family Network Size Round 3	25.1%	562	567
Family Network Size Round 4	30.1%	524	528
Family Network Size Round 5	42.4%	432	437
Mentoring Relationship (MQR)			
MQR Round 1		na	521
MQR Round 2	30.66%	520	572
MQR Round 3	30.80%	519	567
MQR Round 4	36.53%	476	528
MQR Round 5	43.60%	423	437

Table 3.6. (Continued). Percentage of Missingness in Variables Used

Variables	% of Missing Response	Total number of participants responding to a particular questionnaire	Total number of response in each round
Time Variant Variables			
Parent Child Relationships (PRS)			
PRS Round 1	33.06%	502	521
PRS Round 2	25.06%	562	572
PRS Round 3	25.86%	556	567
PRS Round 4	31.06%	517	528
PRS Round 5	42.50%	431	437

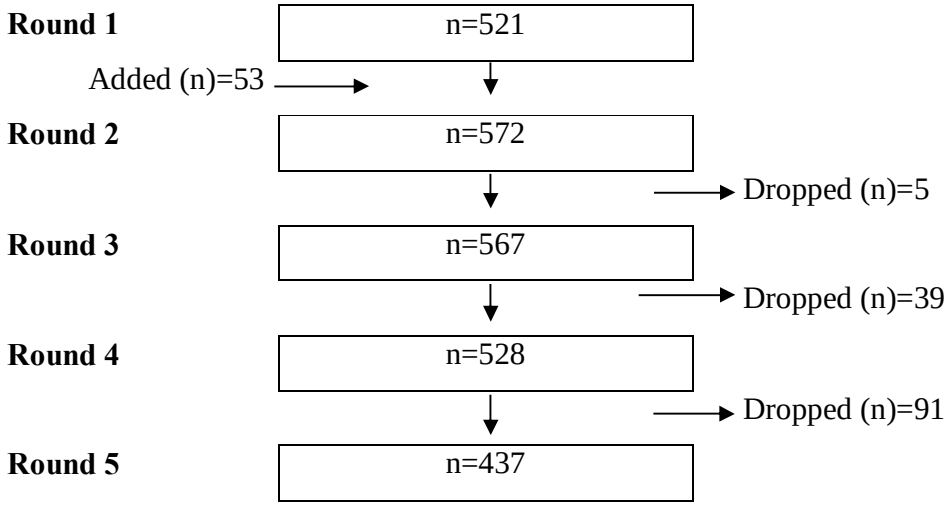
Missingness not associated with design of the questionnaires. Because of such a high level of missingness, there was a need to understand whether or not the missingness was associated with participantsô refusing to answer certain questionnaires because of the items in the survey. Referring back to Table 3.6, the total number of participants responding to a particular scale and the total number of respondents in each round of data collection were similar. Based on these response rates, it was inferred that missingness was associated with particpantsô unwillingness to fill out a particular questionnaire.

Non-random missingness. Subsequent missing analysis was conducted to understand whether or not attrition in the data was systematic. Non-random missingness can cause analytic and interpretation issue, therefore, missing analysis was necessary. Missing data analysis was conducted by logistic regression. The variables of psychological health, mentoring relationship, parent-child relationship, peer network size and family network size collected at each separate rounds were recoded as ñ1ò=miss and ñ0ò=no miss. These newly created variables

were then regressed on the menteeôs socio-economic indicators and individual characteristics to examine whether or not missingness was systematic. Findings of the missing analysis showed that missingness was systematic. Details of analysis are presented in the results section.

Missingness associated with attrition in Round 5. Figure 3.1. is the consort diagram illustrating the number of participants responding to the surveys. As demonstrated, even for Round 1, only 521 out of 750 participants responded. Reasons for the relatively low response rate even at Round 1 could be explained by the fact that the questionnaires were distributed to the respondents by post, who were then asked to mail the surveys back to the managing organization of Network for Health and Welfare Studies. The number of respondents in Round 1, 2, 3 and 4 were quite steady, yet, there was a significant drop in Round 5. The remarkable decrease in the number of respondents in Round 5 implied that some participants migh have dropped out towards the end of the program.

Figure 3. 1. **Diagram illustrating the Number of Participants at Each Round of Data**



Handling Missing data. The full information maximum likelihood (FIML) approach was used to handle the missing data in this dissertation. FIML estimates a set of parameters that maximize the probability of getting the data that was studied (Newman, 2003). The maximum likelihood approach was first introduced in the late 80s and was demonstrated to be superior than listwise and pairwise deletion (Allison, 1987). Stimulation studies showed that FIML and multiple imputation (MI) generated similar findings when data were missing at random (Newman, 2003; Collins, Schafer & Kam, 2001), I decided to use the technique of FIML.

MI is a procedure by which missing data are imputed several times based on the regression parameters randomly drawn from the observed data to estimate the parameters, therefore, slightly different results can be recovered each time when the procedure was used multiple times (Newman, 2003). In addition, MI requires that the data to be imputed under a particular statistical model, which makes the application of it inflexible (Newman, 2003). In contrast, FIML is flexible, easy to be used and available in most statistical software (Newman, 2003). Considering the statistical and practical concerns, I decided to employ the technique of FIML to handle the missingness in my dissertation.

3.5.2. Qualitative Data

Interviews, in Cantonese, were stored in an audio-recorder and were transferred back to a password protected computer at the Center for Suicide Research and Prevention at the University of Hong Kong. Interviews were then transcribed by student research assistants hired by the University of Hong Kong. All transcriptions, in Chinese, were de-identified, then assigned unique case identifier before being analyzed. The softcopy of the transcriptions were stored in an encrypted drive of my laptop, protected by a double password system. Considering that I am a

native Chinese speaker, there is no need to translate the transcriptions into English. Excerpts of the transcriptions were translated only when necessary.

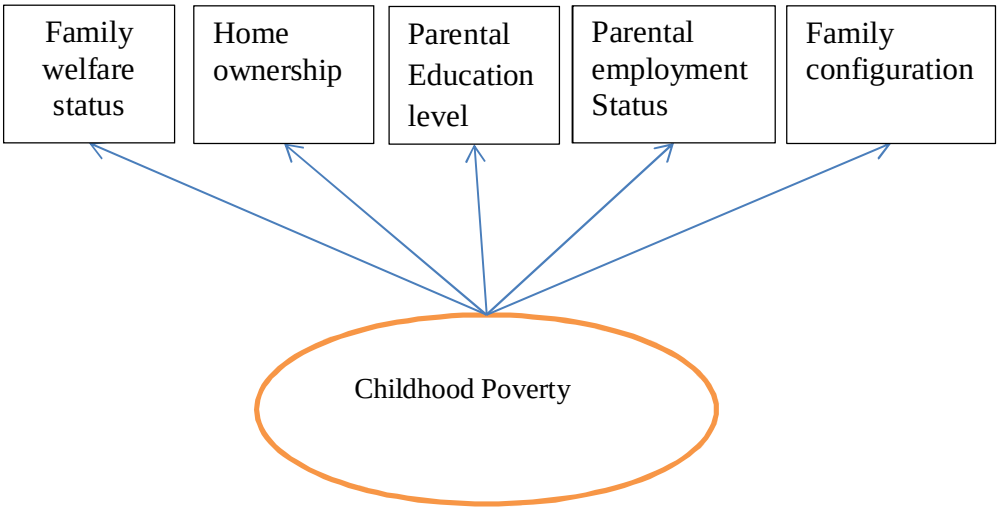
3.6 Methods of Analysis

The analysis of the quantitative data process began with initial data analysis and exploratory analysis. Initial data analysis included univariate analysis and missing analysis. Univariate analysis aimed to check the quality of the data. Missing analysis was used to examine whether or not missingness was systematic. Exploratory analysis included bivariate analysis and empirical and graphical analysis. Bivariate analysis was used to explore the bivariate relationships between variables and informed subsequent hypothesis. Empirical and graphical analysis was conducted to inform model development procedures. Finally, multilevel models were established. The data analysis plan for each aim is described below. All analyses were conducted by Mplus 6.0, R Studio 2.14 and Nvivo 10.0. In the following, I discuss the data analysis plan for each of the aims separately in my dissertation.

3.6.1. Aim 1. Operationalize Childhood Poverty in Hong Kong

Baseline data collected in the Child Development Fund Program were used to achieve this aim. The method of latent class analysis was employed to test **Hypothesis 1.1**: Family welfare status, home ownership, parental education level, parental employment status and family configuration are indicators of the latent variable of childhood poverty. Figure 3.1 is the latent class diagram used in this study.

Figure 3. 2 Latent Variable of Childhood Poverty



The objective of latent class analysis is to ñcategorize people into different classes using observed itemsò (Nylund, Asparouhov & Muthen, 2007, p.539). Another purpose for using latent class analysis is data reduction. Through reducing observed variables into only a few latent factors, interpretations of research findings tend to be easier (McCutheon, 1987). Such clustering created a profile of youth living in poverty in Hong Kong based on their familial socio-economic indicators, which guided me in operationalizing childhood poverty. The newly created latent variables in this aim were used to represent childhood poverty in subsequent analysis. The utilization of a single latent variable to represent childhood poverty made interpretation of findings easier than using multiple socio-economic indicators.

In research concerning childhood disadvantages, latent class analysis was used in studies as an initial step to classify youths at risk into different clusters, and such classification was employed to predict their future developments (Copeland, Shanahan, Costello & Angold, 2009;

Nooner et al., 2010). Copeland et al (2009) used this technique to identify clusters of youths in poverty according to their socio-economic backgrounds, namely, family structure, parental characteristics, familial function and occurrence of stressful life events. This research identified five distinct groups of at risk youth, and their profiles significantly accounted for their psychiatric outcome. Nooner et al. (2010) also adopted this technique to generate profiles of youths according to their self-report history of physical and sexual abuse. Four distinct groups of adolescents with different levels of exposure to sexual or physical abuse were identified.

For my dissertation, Mplus 6.0 was used to perform the analysis. A challenge of latent class analysis was determining the optimal number of classes to be included in the model. Considering that the youth in my sample were already in families that were having below average household income, I did not expect that there would be a wide variation in their poverty level. As such, I proposed a two class model.

In order to confirm that a two class model was the best solution, I compared the model fit statistics of the one class, two class and three class model. Researchers suggested the use of different model fit statistics, for example, AIC, BIC, adjusted BIC and Entropy to determine the optimal number of groups in latent class analysis (Nylund, Asparouhov & Muthen, 2007). For the values of AIC, BIC and adjusted BIC, lower the values showed better fits. Although all these three fit statistics could be interpreted similarly, researchers suggested that the adjusted BIC tends to be superior than AIC and BIC (Nylund, Asparouhov & Muthen, 2007). For entropy, it was a measure of how clearly distinguishable the classes were, and higher values meant better class solutions. I also used graphical analysis to decide on the number of groups that I should classify the youths into. The newly created latent class variable was called ñChildhood Povertyò, and was used as an independent variable in the quantitative analysis of Aim 2 and Aim 3.

3.6.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty

Longitudinal multilevel analysis was conducted to examine the psychological consequences of youths living in poverty in Hong Kong. I examined the effects of childhood poverty, having encountered financial difficulty and parental perceived economic pressure on the changes in the psychological health of youths. The following hypotheses were tested: **Hypothesis 2.1.** The latent variable of childhood poverty has negative effects on the change in the psychological health of youths. **Hypothesis 2.2.** Having experienced financial difficulty has negative effects on the change in the psychological health of youths. **Hypothesis 2.3.** Parental perceived economic pressure has negative effects on the change in psychological health of youths. For the purpose of this part of the study, data collected at all time points were used, except for time 2. The reason for omitting time 2 was that the outcome variable of psychological health was not collected at this time point.

3.6.2.1. Initial Data Analysis, Exploratory Data Analysis and Model Validation

Initial data analysis and exploratory data analysis were carried out. Initial data analysis, which included univariate analysis and missing data analysis, were conducted to check the quality of the outcome variable of psychological health. Graphical analysis was used to examine the distribution of psychological health. Values of central tendency, skewness and kurtosis were also calculated.

Missing data analysis on the outcome variable of psychological health was conducted using logistic regression. In the analysis, the outcome variable of psychological health for each round (i.e., Round 1, Round 3, Round 4 and Round 5) was dichotomized as a binary variable (1= missing and 0=non-missing), which was then regressed on the participantsô individual

demographic and familial socio-economic indicators. If the independent variables were significantly associated with missingness, then, it could be concluded that the missingness was systematic.

Further steps to examine the need to establish a multilevel model and the type of model that should be built were also carried out using exploratory analysis. In the following, I describe the multilevel analysis used to establish the models as well as the exploratory data analysis involved in building the multilevel models.

3.6.2.2 Multilevel Analysis

The objective of using multilevel modeling technique in longitudinal analysis is to represent changes over time. When multilevel modeling is applied to longitudinal data, inter-individual observations over time are nested in each individual participant (Luke, 2004). There are two types of research questions embedded in the time level analysis of multilevel modeling (Singer & Willett, 2003): What is the within-person change over time (i.e., Level 1)? And, what is the between person change over time (i.e., Level 2)? With reference to my dissertation, the research questions that multilevel modeling can answer are (1) What are the changes in the psychological health of youth living in poverty over time? (2) Do the youthsô trajectory differ across their levels of exposure to childhood poverty, family financial difficulty, and parental perceived negative financial impact?

In longitudinal modeling, there is always a time index, which is the independent variable of ñTimeò in my data set. The outcome variable of ñ*psychological health*ò is time-varying because I am interested in understanding how this outcome changes over time. Gender, age, childhood poverty, having encountering financial difficulty and parental perceived economic pressure are time-invariant variables collected at baseline.

Multilevel Analysis: Exploratory Data Analysis. Before establishing the longitudinal models, the data set were organized into the long format for analysis in my dissertation. After the data were transformed from wide to long format, I started building the longitudinal model using RStudio 2.14.

The first step of exploratory data analysis was to decide on whether or not a multilevel model was needed. The first justification came from the statistical and structural properties of the data. Given that the data set was longitudinal, observations were nested in each participant. It is logical to assume that observations belonging to the same participant were more similar to each other than they were to observations belonging to different participants. The nested structure of the data set already showed that the independence assumption was violated. Multilevel modeling relaxed this assumption and allowed for correlated errors.

Apart from the theoretical assumptions, empirical analysis can be carried out by calculating values of the intraclass correlation coefficient (ICC). ICC measures the proportion of the variance in the dependent variable that is accounted for by the groups (Luke, 2004). ICC is calculated based on the null model, with no level 1 or level 2 predictors. The formula is: Level 2 error / (Level 1 error + Level 2 error). I calculated the ICC of psychological health to see if multilevel modeling was necessary. Graphical analysis investigating the plots of psychological health trajectory against time was performed to examine the level of variability that existed at the individual level.

The second step is to decide on whether an intercept-varying or slope-varying model should be adopted for further analysis. In order to do so, I generated two models: an intercept-varying and a slope-varying unconditional linear growth curve model with time as the sole independent variables. Results of these two models were compared using ANOVA to determine

whether an intercept-varying or a slope-varying model showed better model fit statistics. Equation 3.0 and 3.1 are the mathematical representations of the unconditional linear growth curve model of psychological health overtime:

Equation 3.0. Intercept-varying : Unconditional Growth Curve Model with Psychological Health as Outcome

Level 1: $PsyH_{ij}=ß_{0j}+ ß_{1j}(Time)_{ij}+ Ů_j$

Level 2: $ß_{0j}=ↄ_{00}+µ_{0j}$

$ß_{1j}=ↄ_{10}$

Equation 3.1. Slope-varying : Unconditional Growth Curve Model with Psychological Health as Outcome

Level 1: $PsyH_{ij}=ß_{0j}+ ß_{1j}(Time)_{ij}+ Ů_j$

Level 2: $ß_{0j}=ↄ_{00}+µ_{0j}$

$ß_{1j}=ↄ_{10}+µ_{1j}$

The third step is to examine whether or not the estimated change in psychological health of these youths is linear or quadratic. Model comparison using ANOVA was employed to test if the quadratic model was significantly better than the linear model. The model showing the best fit statistics was used for subsequent analysis. Equation 3.2 and Equation 3.3 are examples of the mathematical representations of a slope varying linear and quadratic multilevel model respectively:

Equation 3.3. A slope varying linear multilevel model with psychological health as outcome

Level 1: $PsyHij=ß0j+ ß1j(time)ij+ Ůj$

Level 2: $ß_{0j}=ↄ_{00}+µ_{0j}$

$ß_{1j}=ↄ_{10}+µ_{1j}$

$ß_{2j}=ↄ_{20}$

Equation 3.3. A slope varying quadratic multilevel model with psychological health as outcome

Level 1: $PsyHij=ß0j+ ß1j(time)ij+ ß2j(time)^2ij+Ůj$

Level 2: $ß_{0j}=ↄ_{00}+µ_{0j}$

$ß_{1j}=ↄ_{10}+µ_{1j}$

$ß_{2j}=ↄ_{20}$

Multilevel Analysis: Adding Main and Interaction Effects. The independent variables of childhood poverty, family financial difficulty, parental perceived economic pressure and individual characteristics were added to the model to examine the effect of these time-invariant variables in the psychological health of youths. For instance, Equation 3.4 is the mathematical expression of the slope-varying multilevel model examining the quadratic change in the psychological health of youths living in poverty.

Equation 3.4: The hypothetical main effect model

Level 1: PsyHij=ß0j+ ß1j(time)ij+ ß2j(time) ²ij+Ůj

Level 2: ß0j=Ↄ00+Ↄ01(Gender)+ Ↄ02(Age)+ Ↄ03(Child_Poverty)+ Ↄ04 (Financial_Diff)+ Ↄ05 (Parent_Preceived_EconP)+µ0j

ß1j=Ↄ10+µ1j

ß2j=Ↄ20

Finally, to test whether or not the psychological health trajectories of participants varied according to their exposure to childhood poverty and financial difficulty as well as parental perceived economic pressure, interaction effects were added. For example, I am interested in examining whether or not the psychological health development of the participants differs across their exposure to childhood poverty. Equation 3.5 is the hypothetical mathematical expression of the slope-varying quadratic multilevel model illustrating the interaction effect:

Equation 3.5: The hypothetical interaction effect model

Level 1: PsyHij=ß0j+ ß1j(time)ij+ ß2j(time) ²ij+ ß3j(time) (Child_Poverty)ij +Ůj

Level 2: ß0j=Ↄ00+Ↄ01(Gender)+ Ↄ02(Age)+ Ↄ03(Child_Poverty)+ Ↄ04 (Financial_Diff)+ Ↄ05 (Parent_Preceived_EconP)+µ0j

ß1j=Ↄ10+ µ1j

ß2j=Ↄ20

The fit statistics of deviance of established model and the null model was compared using ANOVA to examine how closely the established model fit the data. In addition, Level 1 R ï square and Level 2 R ï square were also calculated to examine the proportion reduction of error

in the established model versus the null model. Level 1 R-square assessed the proportional reduction of error for predicting the outcomes of each observation. Level 2 R-square assesses the proportional reduction of error for predicting the individual outcomes. These values evaluate the overall statistical significance of the multilevel model.

Multilevel Analysis: Model Validation. Model validation procedures were also carried out to validate the model. Procedure involved examining (1) the problem of constant error by plotting the fitted values against the standardized residuals of the model, (2) the non-normal distribution of error through graphical analysis and (3) the existence of outliers and influential data by calculating the cooksôdistance and by closely examining the data (Fox, 1991).

3.6.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty

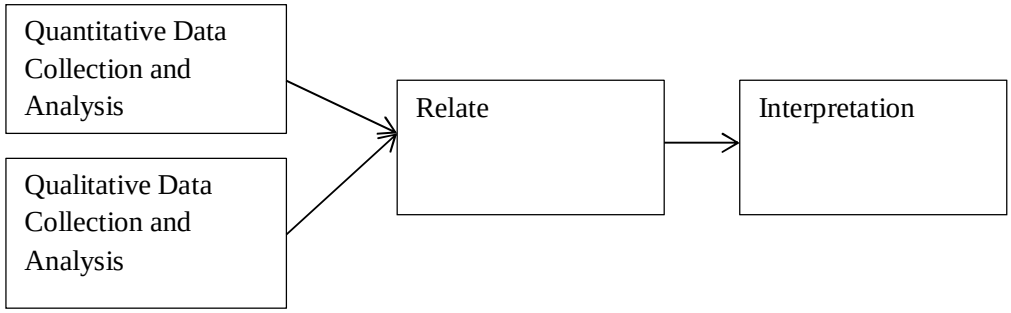
This part of the study is the core of this dissertation. Results of this aim provided me with information to establish a framework to understand how mentoring promotes the psychological health of youths living in poverty in Hong Kong. In order to achieve this aim, quantitative and qualitative analysis were used.

For the quantitative analysis, three hypotheses were formulated. I examined: **Hypothesis 3.1.** The direct positive effect of mentoring on the change in the psychological health in youths living in poverty; **Hypothesis 3.2.** The direct positive effects of natural social relationships on the changes in the psychological health of the youths living in poverty; **Hypothesis 3.3.** The indirect effect of mentoring on the psychological health mediated by different types of natural social relationships.

For the qualitative analysis, three research questions were asked. **Research Question 3.1**. What are positive psychological and social outcomes experienced by the mentees after participating in mentoring programs? **Research Question 3.2.** What kinds of social resources are embedded in mentoring? **Research Question 3.3.** How are these resources associated with different types of psychological health?

A mixed method parallel design, which consisted of a quantitative and a qualitative strand, were adopted to achieve Aim 3 (Creswell & Plano Clark, 2011). In this design, data collection and analysis were conducted separately, and the mixing of the data occurred during the interpretation stage of the study (Figure 3.2).

Figure 3. 3 An illustration of the study design of a convergent parallel design



The rationale for this approach is to obtain different but complementary data on the effects of mentoring relationship on psychological health of youths living in poverty in Hong Kong (Creswell & Plano Clark. 2007). Such design brings together the different strengths of quantitative and qualitative methods, which expands breath and richness of the findings (Creswell & Plano Clark, 2007). More generalizable interpretation can be made from the quantitative data than the qualitative data because of the large sample size included. In addition,

the longitudinal nature of the study allows researcher to take into account the effect of time, which the qualitative data is not able to capture. For the qualitative data, interviews allow me to ask in-depth research questions that are not covered in the quantitative survey (Bryman, 2006). As such, I am able to gain broad and in-depth understanding on the topic of interests from the different findings.

Because the quantitative and qualitative data were obtained from two mentoring programs with dissimilar context, orientations and participants (see Table 2.1), information from the two data sets may diverge. Such dissimilar findings may make interpretation difficult; yet, the diverged results may guide us in asking meaningful follow up questions. For example, how do the different characteristics of participants affect program effectiveness?

The use of this approach also has a pragmatic advantage. Given the limited time I had to complete my dissertation research, the use of the secondary data allowed me to examine the effects of mentoring on the psychological and social outcomes of the participants over time. At the same time, I could also collect primary in-depth qualitative data. As suggested by Creswell and Plano-Clark (2007), this design is most suited for sole researcher who could collect limited quantitative and qualitative data. In the following, I first describe the analysis used in the quantitative strand, followed by the qualitative strand. Last, I discuss the merging of the two sets of data.

3.6.3.1 Quantitative Analysis

Data from the Child Development Fund Program was used in this part of the study. The aims for this quantitative part of the study were to examine the following hypotheses: **Hypothesis 3.1.** The direct positive effect of mentoring on the change in psychological health in youths living in poverty. **Hypothesis 3.2.** The direct positive effects of different types of natural

social relationships on the changes in the psychological health of youths living in poverty**.** and **Hypothesis 3.3.** The indirect effect of mentoring on psychological health mediated by different types of natural social relationships.

Data from Round 1, 3, 4, and 5 were used. Baseline (i.e, Round 1) data were time-invariant variables, namely, the latent variable of childhood poverty, financial difficulty and parental perceived economic pressure. For the time-varying variables of psychological health, mentoring relationship, parent-child relationship, peer network size and family network size, only data collected from Round 3 to 5 were used. Such a decision was made because the measure of mentoring relationship was not administered during baseline and the measure of psychological health was not administered in Round 2. Table 3.7 illustrates the variables used in each round of data.

Table 3. 7. Variables and Rounds of Data Used

Variables	Round of Data Used
Time-varying variable	
Outcome	
Psychological Health	3, 4, & 5
Independent Variables	
Mentoring Relationship	3, 4, & 5
Parent-child Relationship	3, 4 & 5
Peer Network Size	3, 4 & 5
Family Network Size	3, 4 & 5
Time-invariant variable	
Independent Variable	
Mentoring Relationship	2
Covariates	
Childhood Poverty	1
Financial Difficulty	1
Perceived Parental Economic Pressure	1
Psychological Health	1
Gender	1
Age	1

Multilevel modeling technique was used to test the hypotheses. Initial data analysis, exploratory data analysis and model validation procedures were adopted prior to establishing the multilevel models. Multilevel modeling technique was used to test the effect of mentoring on psychological health, the effects of different types of social relationships on psychological health, and the effects of mentoring relationship on different types of social relationships. Finally, mediation analysis was employed to examine the mediating role of different types of natural social relationships on the effect of mentoring on psychological health (Baron & Kenny, 1986). A total of five multilevel models were generated to fulfill all quantitative aims.

Quantitative Analysis: Initial Data Analysis. Univariate analysis and missing analysis were conducted to check the quality of the time-varying variables of psychological health, mentoring relationship, peer network size and family network size. Considering the details of how to conduct initial data analysis were covered in Aim 2, I would not discuss it here. Please refer to Section 3.6.2.1 for details.

Quantitative Analysis: Exploratory Analysis. Exploratory data analysis was carried out to inform model development procedures. First, correlation analyses, using Stata 16.0, were performed to understand the bivariate associations between all time-varying variables. Spearman rank correlations were used to analyze the social network size variables of peers and family, because they were count data. Bonferroni correction was used to correct the problem of multiple comparisons. This step of data analysis was important because the preliminary findings guided the direction of subsequent part of the study.

Further exploratory data analyses were conducted to examine the need to establish multilevel models and whether or not intercept or slope-varying models should be built. Equation

3.6 and 3.7 are the mathematical representations of the intercept and slope-varying unconditional linear growth curve models of psychological health respectively:

Equation 3.6. Intercept-varying : Unconditional Growth Curve Model with Psychological Health as Outcome

Level 1: $PsyH_{ij} = ß_{0j} + ß_{1j}(Time)_{ij} + Ů_j$

Level 2: $ß_{0j} = ↄ_{00} + µ_{0j}$

$ß_{1j} = ↄ_{10}$

Equation 3.7. Slope-varying : Unconditional Growth Curve Model with Psychological Health as Outcome

Level 1: $PsyH_{ij} = ß_{0j} + ß_{1j}(Time)_{ij} + Ů_j$

Level 2: $ß_{0j} = ↄ_{00} + µ_{0j}$

$ß_{1j} = ↄ_{10} + µ_{1j}$

Because this quantitative analysis only involved three rounds of data, only linear longitudinal models could be established. Therefore, no analysis was performed to decide on whether a quadratic or linear model fit the data better.

Quantitative Analysis: Multilevel Modeling (Direct Effect).

Multilevel modeling, administered with R studio 2.14, was used to establish the longitudinal models testing the direct effect of mentoring on the change in psychological health, and the direct effects of different natural social relationships on changes in psychological health, controlling for mentoring.

To test the direct effect of mentoring on the changes in psychological health, the outcome variable used was psychological health measured from round 3 to 5. Time-varying independent variable was mentoring relationship measured from round 3 to 5 and the time invariant predictor of mentoring relationship measured at round 2. Covariates were the time-invariant variables of childhood poverty, having experienced financial difficulty, perceived parental economic pressure, gender, initial age at enrollment and psychological health of the participants measured at baseline.

First, a main effect model was built. Then, interaction effect model was established to test the effects of mentoring relationship on the change in psychological health. Equation 3.8 is the hypothetical intercept-varying model testing the main effect model of mentoring on psychological health. Equation 3.9 is the hypothetical intercept-varying model testing the interaction effect (Time x Mentoring relationship) of mentoring on changes in psychological health.

Equation 3.8: Main effect model of mentoring on psychological health

Level 1: PsyHij=ß0j+ ß1j(time)ij+ ß2j(Mentoring relationship)ij+Ůj

Level 2: $ß_{0j}=Ↄ_{00}+ Ↄ_{01}$(Mentoring relationship at Round 2)+$Ↄ_{02}$(Gender)+ $Ↄ_{03}$(Age)+
$Ↄ_{04}$(Child_Poverty)+ $Ↄ_{05}$ (Financial_Diff)+
$Ↄ_{06}$ (Parent_Preceived_EconP)+ $Ↄ_{07}$(PsyH_baseline)+$µ_{0j}$

$ß_{1j}=Ↄ_{10}$

$ß_{2j}=Ↄ_{20}$

Equation 3.9: Interaction effect model of mentoring on psychological health

Level 1: PsyHij=ß0j+ ß1j(Time)ij+ ß2j(Mentoring relationship)ij+ ß2j(Mentoring relationship)(Time)ij+Ůj

Level 2: $ß_{0j}=Ↄ_{00}+ Ↄ_{01}$(Mentoring relationship at Round 2)+$Ↄ_{02}$(Gender)+ $Ↄ_{03}$(Age)+
$Ↄ_{04}$(Child_Poverty)+ $Ↄ_{05}$ (Financial_Diff)+
$Ↄ_{06}$ (Parent_Preceived_EconP)+ $Ↄ_{07}$(PsyH_baseline)+$µ_{0j}$

$ß_{1j}=Ↄ_{10}$

$ß_{2j}=Ↄ_{20}$

To test the direct effects of different types of natural social relationships on the changes in psychological health, the time-varying independent variables of parent-child relationship, family network size and peer network size were added to the equation. The decision on what types of natural social relationships to include in this model depended on the results of the correlation analyses. For instance, if parent-child relationship, family network size and peer network size were all found to be associated with psychological health in the correlation analyses, they would be added in the model. Equation 3.10 is the hypothetical intercept varying model testing the

direct effect of parent-child relationship, family and peer network size on psychological health, controlling for mentoring.

Equation 3.10: The main effect model testing effects of all natural social relationships on psychological health

Level 1: PsyHij=ß0j+ ß1j(time)ij+ ß2j(Mentoring relationship)ij+
ß3j(Parent-child Relationship)ij+ ß4j(Family Network Size)ij+
ß5j(Peer Network Size)ij+Ůj

Level 2: $ß_{0j}=Ↄ_{00}+ Ↄ_{01}$(Mentoring relationship at Round 2)+$Ↄ_{02}$(Gender)+ $Ↄ_{03}$(Age)+
$Ↄ_{04}$(Child_Poverty)+ $Ↄ_{05}$ (Financial_Diff)+
$Ↄ_{06}$ (Parent_Preceived_EconP)+ $Ↄ_{07}$(PsyH_baseline)+$µ_{0j}$

$ß_{1j}=Ↄ_{10}$

$ß_{2j}=Ↄ_{20}$

Equation 3.11 is the mathematical expression of the interaction model testing the direct effect of all natural social relationships on the changes in the psychological health of youth living in poverty.

Equation 3.11: The interaction effect model testing the effects of all natural social relationships on the psychological health

Level 1: PsyHij=ß0j+ ß1j(time)ij+ ß2j(Mentoring relationship)ij+
ß3j(Parent-child Relationship)ij+ ß4j(Family Network Size)ij+
ß5j(Peer Network Size)ij+ ß6j(Mentoring relationship)(Time)ij+ ß7j(Parent-child Relationship)(Time)ij+ ß8j(Family Network Size)(Time)ij+
ß9j(PeerNetwork Size)(Time)ij+Ůj

Level 2: $ß_{0j}=Ↄ_{00}+ Ↄ_{01}$(Mentoring relationship at Round 2)+$Ↄ_{02}$(Gender)+ $Ↄ_{03}$(Age)+
$Ↄ_{04}$(Child_Poverty)+ $Ↄ_{05}$ (Financial_Diff)+
$Ↄ_{06}$ (Parent_Preceived_EconP)+ $Ↄ_{07}$(PsyH_baseline)+$µ_{0j}$

$ß_{1j}=Ↄ_{10}$

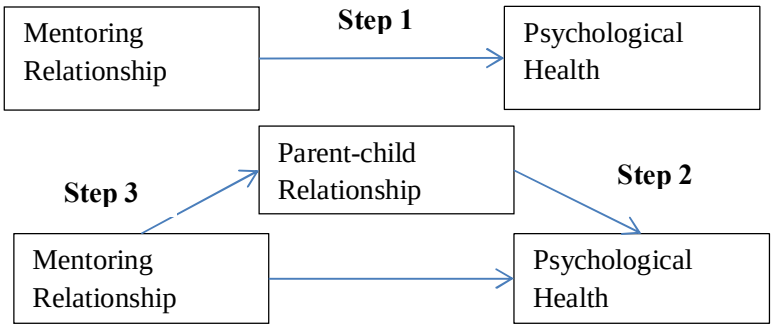
$ß_{2j}=Ↄ_{20}$

Quantitative Analysis: Mediation analysis (Indirect Effects).

Mediation analysis, based on Baron and Kenny (1986) mediation model, was used to test the indirect effect of mentoring relationship on psychological health via different types of natural social relationships. Because hypothesis 3.3 focuses on testing the indirect effect of mentoring on psychological health in natural social relationships, the interaction effect of the model was

not established. The decision of what types of natural social relationships to include in the mediation analysis depended on the results of the correlation analyses. For instance, if the variable of parent-child relationship was found to be associated with both psychological health and mentoring relationship, it would be included in the analyses. The following describes the four steps taken to examine the mediating effect of parent-child relationship (Barron & Kenny, 1989). Figure 3.3 illustrates the step taken to conduct the mediation analysis.

Figure 3.4 Steps to Mediation Analysis



Step 1: Variations in mentoring relationship (independent variable) significantly accounted for the variations in psychological health (outcome variable). To examine the effect of mentoring on psychological health, psychological health was first regressed on the index of time and the time-varying independent variables of mentoring relationship. Non-time varying independent variables were age, gender, levels of childhood poverty, having experienced financial difficulty, perceived parental economic pressure and psychological health measured at baseline (Equation 3.8). This model (Reduced Model) provided evidence on the effect of mentoring relationship on psychological health, and set the stage for subsequent mediation analysis (Baron & Kenny, 1986).

Step 2: Variations in parent-child relationship (mediator) significantly accounted for variations in psychological health (outcome variable). This model examined the effects of parent child relationships on psychological health, controlling for mentoring relationship. Model comparison using ANOVA were then used to compare this model with the baseline model to determine which model showed fitted the data better. If the full model showed a better fit than the reduced model, it suggested that parent- child relationships might mediate the effects of mentoring on psychological health (Baron & Kenny, 1986).

Step 3: Variations in mentoring relationship (independent variable) significantly accounted for the variations in parent child relationships (mediator). I further tested the effect of mentoring relationship on parent-child relationship. In this multilevel model, time varying outcome was parent-child relationship. Time-varying independent variable was the mentoring relationship, non-time varying independent variables were age, gender, levels of childhood poverty, having experienced financial difficulty, parental perceived economic pressure, mentoring relationship measured at Round 2, and parent-child relationship measured at baseline. Results provided evidence informing the effects of mentoring on changes in social relationships over time. Equation 3.12 is the mathematical representation of the hypothetical intercept varying model testing the direct effect of mentoring on parent-child relationship.

Equation 3.12: The model testing direct effect of mentoring relationship on parent-child relationship

Level 1: Parent-ChildHij=ß0j+ ß1j(time)ij+ ß2j(Mentoring relationship)ij+
+Ůj

Level 2: Level 2: $ß_{0j}=Ↄ_{00}+ Ↄ_{01}$(Mentoring relationship at Round 2)+$Ↄ_{02}$(Gender)+ $Ↄ_{03}$(Age)+
$Ↄ_{04}$(Child_Poverty)+ $Ↄ_{05}$ (Financial_Diff)+
$Ↄ_{06}$ (Parent_Preceived_EconP)+ $Ↄ_{07}$(Parent-Child_baseline)+$µ_{0j}$

$ß_{1j}=Ↄ_{10}$

$ß_{2j}=Ↄ_{20}$

Step 4: When parent-child relationship (mediator) were controlled, the effect of mentoring relationship (independent variable) on psychological health (outcome variable) was smaller than that in the model established in step 1. I compared the parameter estimates of mentoring relationship on psychological health in the multilevel model established in Step1 with that in Step 2. If the effect of mentoring in assumption 1 was larger than that in assumption 2, then, I concluded that natural social relationships mediated the effect of mentoring relationship on changes in psychological health over time.

3.6.3.2 Qualitative Analysis

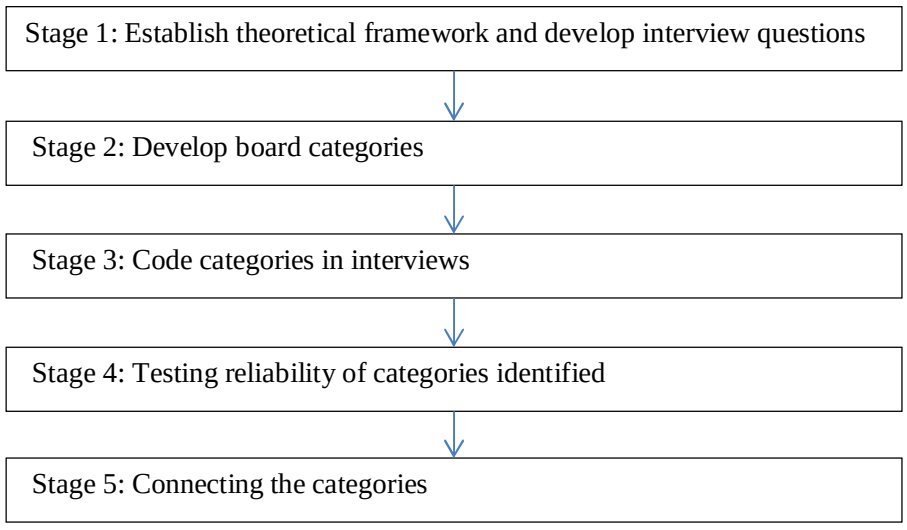
Interview data for the School Based Problem Solving Skills Mentoring Program were used for the current analysis. The purpose of carrying out this qualitative study is to confirm and expand the quantitative part of the study. In addition to exploring the direct and indirect effects of mentoring on psychological health, the qualitative information also tells us about the types of social resources embedded in mentoring relationship associated with positive psychological and social outcomes in youths. I intended to answer the following research questions: **Research Question 3.1**. What are positive psychological and social outcomes experienced by the mentees after participating in the mentoring program? **Research Question 3.2** What kinds of social resources are embedded in mentoring relationship? **Research Question 3.3.** How are these resources associated with different types of psychological health?

This qualitative strand of the study utilizes a theory driven thematic analysis approach for data analysis. This approach relies heavily on the theories of Stress Buffering Hypotheses, Strengths of Weak Ties and Self Efficacy Theory of described in Chapter 2. I decided to use this approach because the purpose of this part of the study is to provide more information to further establish the theoretical framework as well as expand the quantitative findings.

Qualitative analysis: thematic analysis. A theory driven thematic analysis approach was used to analyze the qualitative information (Boyatzis, 1998). Thematic analysis is the process of sorting data into categories and identifying themes associated with the topic of interests. In theory driven thematic analysis, themes are generated deductively from existing theories. The qualitative data was expected to complement and expand the quantitative findings. When analyzing the qualitative information, 6 stages are involved. The chart in Figure 3.5 represents each stage of analysis:

Stage 1: Existing theories associated with the topic of interests were reviewed and a theoretical framework was established using the theories. In this aim, the Social Capital Theory, the Self-Efficacy Theory, Stress Buffering Hypothesis and Strength of Weak Ties Theories were used to generate the theoretical framework (See Chapter 2).

Figure 3. 5 Flow Chart for the Process of Analyzing the Qualitative Data



Stage 2: Based on the theoretical framework, broad categories were initially developed. In my study, I initially developed the following categories for coding. Dependent categories

were: improvement in psychological Outcomes (Positive Affect and Self-Confidence), and improvement in existing social relationships (Peers and Family). Independent categories were: Companionship, direct advice, expectations and role modeling. (See Chapter 2, Table 2.1). Table 2.1 are the definitions of these categories, which guide me into identifying them in the interviews.

Stage 3: Information was continually analyzed during the interview process, and categories were identified in the interviews. Interview questions were modified and added in order to gain a more in-depth idea of the topic of interests. Such data analysis process is a ñzig zagò process (Charmaz, 2006), when the researcher engages in the back and forth process of collecting and analyzing the data throughout the research process. During this coding stage, I also engaged in memo-writing. Writing memos helped me get involved in the analysis and gain insight in the latent meanings embedded in the interviews (Charmaz, 2006; Boyatzis, 1998). Additional categories were identified during this coding process, and some categories were dropped.

Stage 4: Considering that the theory driven approach was more prone to the researcher subjective interpretation of the data, I invited another doctoral student in the social work field to code the interviews as well. Our results were compared, and no modifications in the code template are necessary.

Stage 5: At this stage, the categories identified were connected to form a framework that allowed comparison between the quantitative and qualitative data.

Qualitative analysis: Data storage and Software. Information on the participants and hard copies of the questions were kept in folder locked in a file cabinet at the Center for Suicide Prevention and Research at the University of Hong Kong. The audio files and

the transcriptions of the interviews were stored in a password protected computer. After each interview, audio recordings were loaded into the software program of NVivo 10.0. All codes and memos were stored in NVivo 10.0.

Qualitative analysis: Strategies for Rigor. The methods described above ensured the rigor of the study. For example, the double coding technique used in this study helped confirm findings and checked for researcher bias (Boyatzis, 1998). Additionally, the step by step analytic process outlined above demonstrated that careful planning was involved in the process of the study (Fereday & Muir-Cochrane, 2006). The initial categories were developed according to existing theories and clear definitions were given to each category, so that I could identify them in the interviews without being affected by own beliefs and assumptions (Boyatzis, 1998). Last, data saturation was reached. Saturation was reached when the data became redundant, and repetition of codes and common themes emerged (Charmaz, 2007). I found repetition of the categories in the interviews. Common patterns were also evident in the data.

3.6.3.3 Mixed Methods Analysis

The final step of this dissertation was to merge the quantitative with qualitative data analyzed in this aim. In this mixed parallel convergent design, the merging of the data occurred after the quantitative and qualitative data were analyzed separately (Creswell & Plano Clark, 2007). By merging the two data sets at the interpretation stage, a complete picture was developed.

Two techniques were used to merge the quantitative and qualitative data in this dissertation: Data transformation and Data comparison. The technique of transforming the qualitative data into quantitative data was used to merge the data. In this technique, the qualitative data were transformed into dichotomous variable. Each participant was given a score

of 1 if a theme was presented and a 0 if a theme was not presented (Creswell & Plano Clark, 2007). The matrix was then compared with the findings of the correlation analysis conducted to answer research question 1. If similar patterns emerged, the validity of the findings was increased. If the findings diverge, then reasons underlying the differences were discussed. The process of transforming the qualitative information data into quantitative data for comparison was used in Paganoôs et al. (2002) study to examine parent socialization practices.

The technique of data comparison was also used. Findings of the quantitative analysis were compared with the interview information. Similar findings provided additional support on the validity of the results. For findings that diverged, I explained such differences in the discussion section. Finally, a merged framework based on the quantitative and qualitative findings was established.

Chapter 4. Results

This chapter presents results of this dissertation according to the aims discussed in the methodology chapter. Before I talk about the results of Aim 1, 2 and 3, I first presented the participants characteristics of the quantitative and the qualitative study.

For the quantitative data, out of the 750 participating mentees, 292 were males and 458 were females. Their mean age at enrollment was 14. The majority of the participants were permanent residents of Hong Kong, with 12% (n=90) of them as non-local residents.

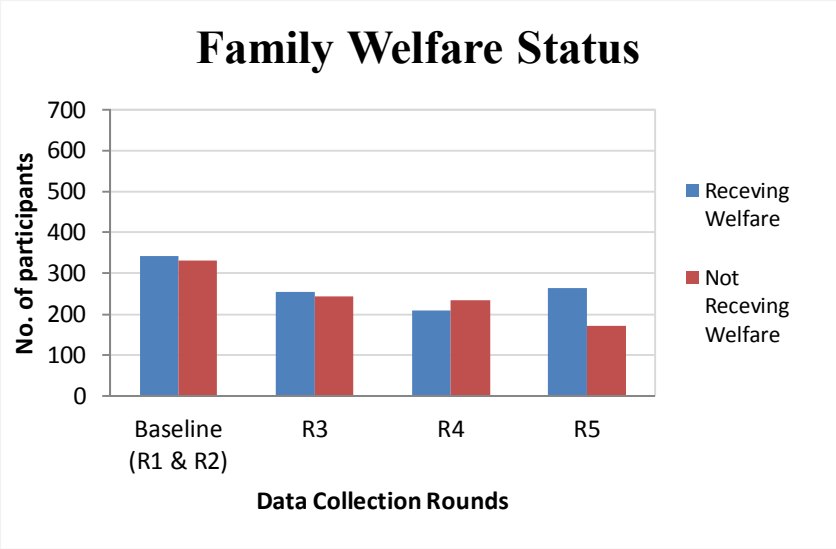
All familial socio-economic information was provided by parents of the mentees. Because the interval between Round 1 and Round 2 of the data collection period span only 6 months, parents who provided familial demographic data in Round 1 were not asked to provide similar information in Round 2. As such, I decided to combine the socio-economic data of Round 1 and Round 2 and use it as baseline information in my dissertation. Figure 4.1 shows the socio-economic information of family welfare status, parental employment status and home ownership and family configuration across all 5 waves. For parental education level, because it would not change over time, I only reported the baseline information of this characteristic: approximately 53% (n=306) of the parents did not complete lower secondary school.

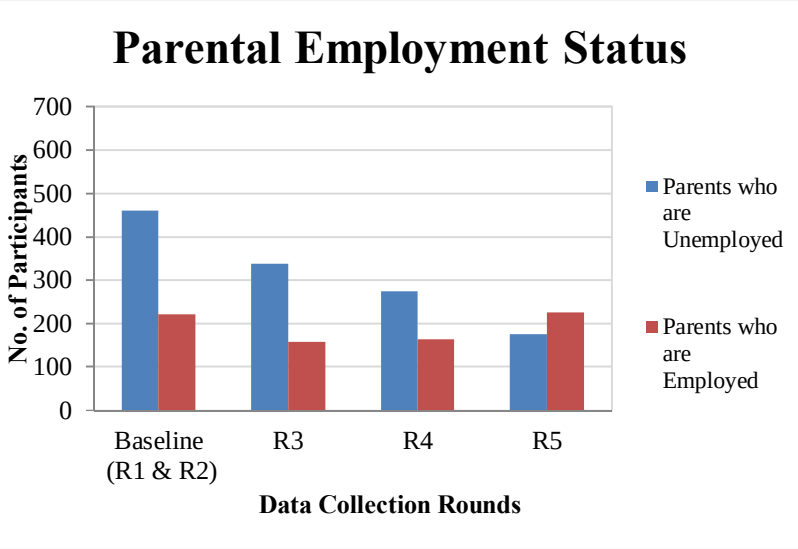
The graphs in Figure 4.1 shows that the number of participants responding to the survey decreased over time. More importantly, the familial socio-economic status of the participants seemed to change over time. For parental employment status, while there was a higher number of participants with parents who were unemployed in earlier rounds, the situation was reversed in Round 5. As for family configuration, the number of youths who lived in single parent households between Round 1 and Round 4 decreased over time. In Round 5, although there was a slight increase in the number of participants in single parent households, there was a higher

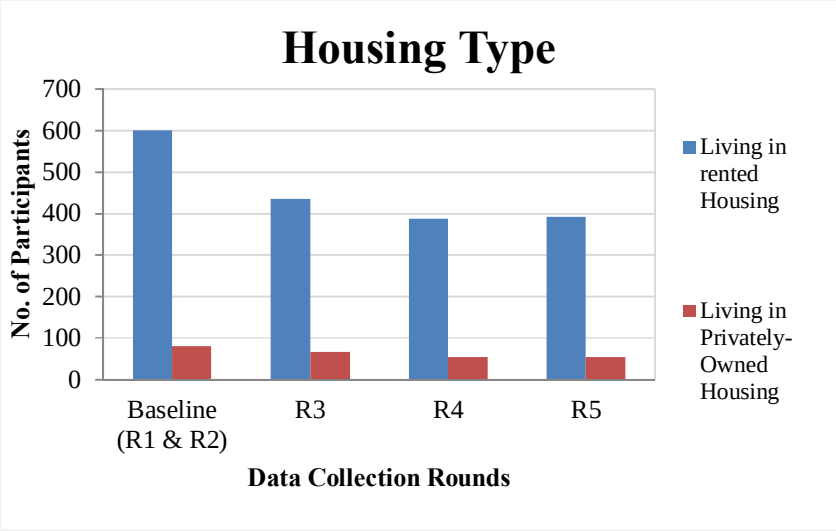
percentage youths resided in non-single parent families. Such changes provided us with a general picture of the participantsô familial circumstances in all rounds of data collection. In addition, it implied that youths who were living in disadvantaged families tended to drop out in the last round of the study. Findings of the missing analysis in Aim 2 and 3 also supported the speculation.

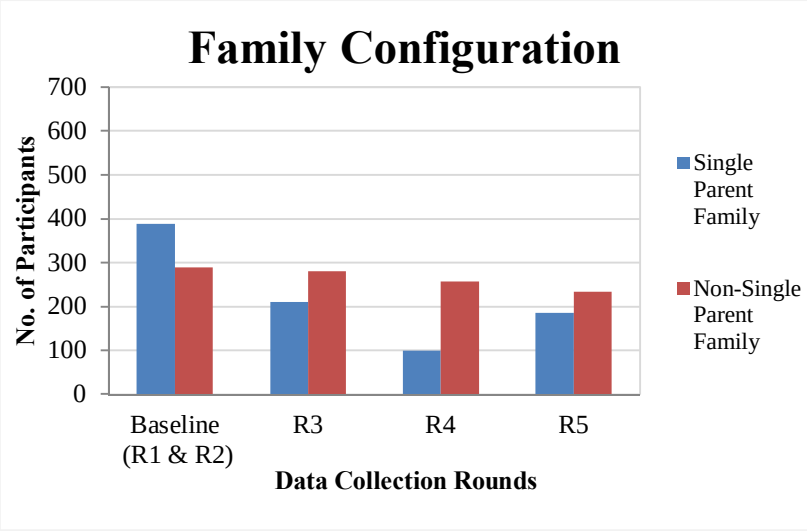
For participants of the qualitative strand, 15 mentors (Male=6; Female=9) and 22 mentees (Male=10; Female=12; aged between 14 and 18) from the School Based Problem Solving Skills Mentoring Program were interviewed. Out of the 15 mentors, 12 were working professionals and 3 were graduate students from the University of Hong Kong. For mentees, 18 were new arrivals from Mainland China, and 4 were locally-born youths. Detailed information about the mentees of this program was not disclosed because the information was not shared publicly by the school.

.Figure 4. 1 **Familial Socio-Economic Status of the Participants Across Five Rounds of Data Collection**









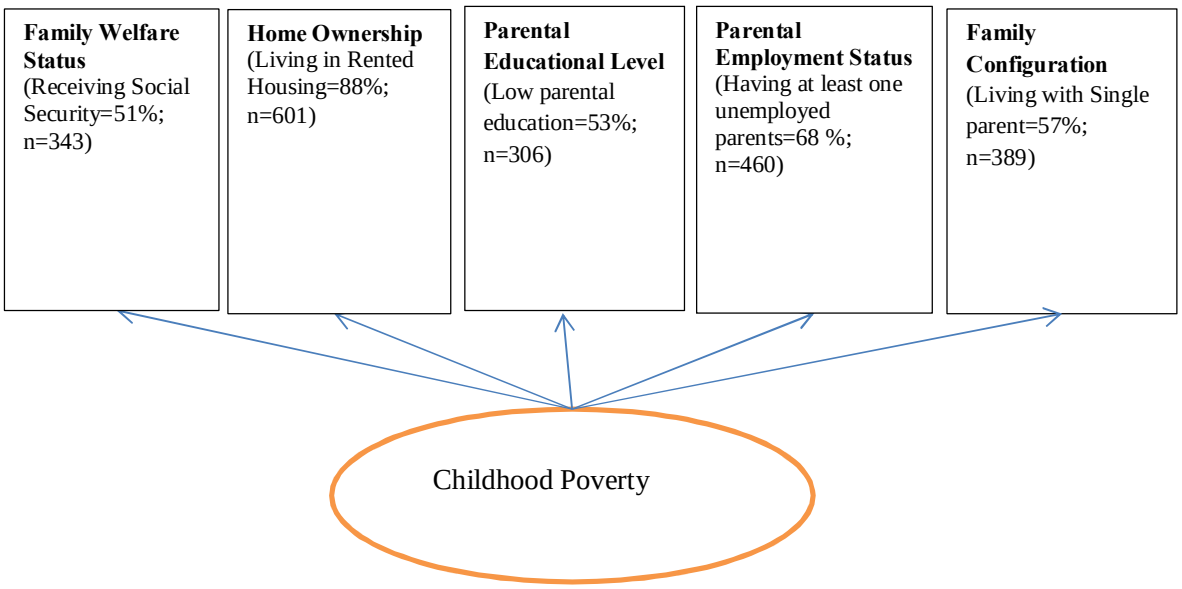
4.1. Aim 1. Operationalize Childhood Poverty in Hong Kong

In order to operationalize childhood poverty in Hong Kong, a latent class analysis was conducted using the binary observed indicators of family welfare status (i.e., receiving social security), home ownership (i.e., living in rented housing), parental education level (i.e., low parental education level), parental employment status (i.e., having at least one unemployed parent) and family configuration (i.e., living in single parent family). Baseline data from the Child Development Fund Program was used to achieve this aim. Family welfare status was collected via the official record of Network for Health and Welfare Studies, other indicators were collected through the parental self-report survey. Results supported hypothesis 1.1, which states that family welfare status, home ownership, parental education level, parental employment status and family configuration are indicators of the latent variable of childhood poverty.

4.1.1. Descriptive Statistics and Model Fit Statistics

Figure 4.2 shows the univariate proportions of the categorical variables used in this analysis. For the categorical variable of family welfare status, 51% of the parents indicated that they were receiving social security at the time of the interview. For home ownership, 88% of the youthsô households lived in rented housing, For parentsôeducation level, 53% of the parents indicated that they had less than lower secondary level of education. For parental unemployment status, 68% of the youths had unemployed parents and, last, 57% lived in single parent family.

Figure 4. 2 Latent class Variable of Childhood Poverty



I compared the model fit statistics of a one class, a two class and a three class solution model to decide on the optimal number of groups that should be classified (See Appendix E). Values of model fit statistics, AIC, BIC and Sample adjusted BIC, showed that a two class solution was clearly better than a one class solution; yet, the two class solution is not better than the three class one. On the other hand, the Entropy showed that the two class solution was most suitable. Graphical analysis was further used to examine whether a two class or a three class solution was better (See Appendix E). Findings, again, showed that a two class solution was more distinct that the three class one. As such, the youths were classified into two classes.

4.1.2. Classification of Youths into "Living in Households Receiving Welfare" versus "Living in Households Not Receiving Welfare"

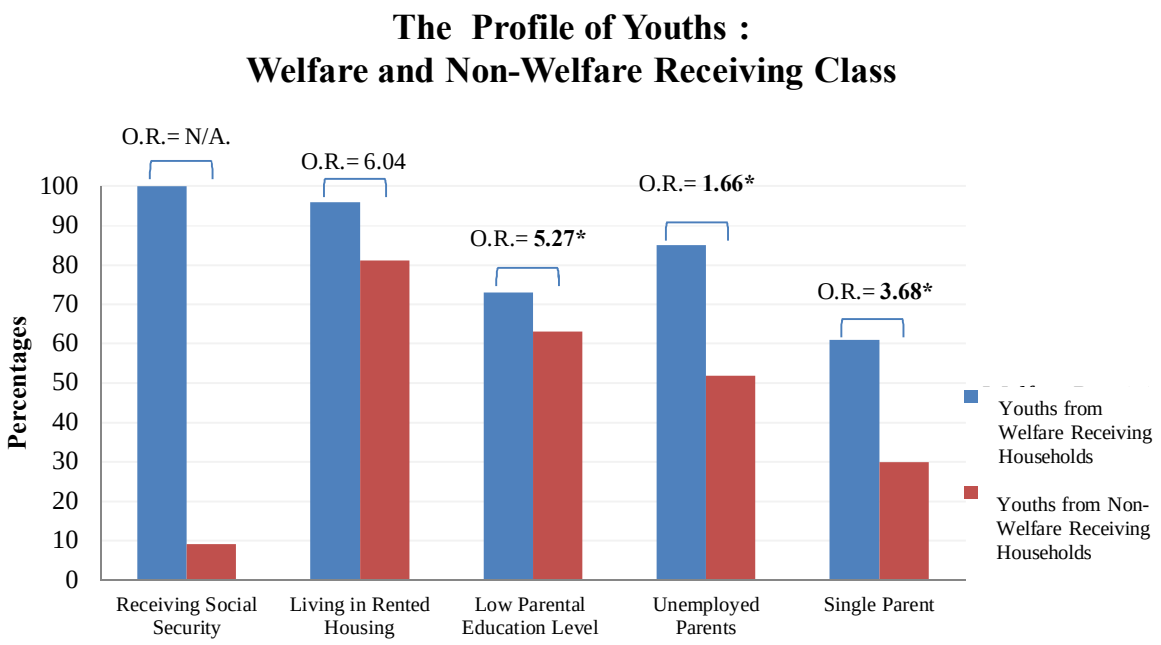
Based on the two class solution, Mplus calculated the results of the probability scale , which informed us how the class differed on the indicators of childhood poverty (Table 4.1). All the youth in class 1 received social security, while only 9% of the youth in class 2 received social security. Ninety six percent (96%) of the youth in class 1 lived in rented housing compared to eighty one percent (81%) in class 2. For parental education level, 73% of the youth in class 1 had parents who had low education level versus 63% of those in class 2. Eighty five percent (85%) of those in class 1 had at least one parent who was unemployed in their households versus 52% of those in class 2. Last, 61 % of the youth in class 1 lived with single parent versus 30% of those in class 2. Such information indicated that class 1 could be described as ñLiving in Households Receiving Welfareò and class 2 as ñLiving in Households Not Receiving Welfareò.

Table 4. 1 Different Percentages of Youths in Class 1 and Class 2

		Two Class	
Indicator	Overall Proportion	Class 1 Welfare Receiving (n=348)	Class 2 Non-Welfare Receiving (n=343)
Family Welfare Status (Receiving Social Security)	51%	100%	9%
Home Ownership (Rented housing)	88%	96%	81%
Parent Education Level (Low)	53%	73%	63%
Parent employment Status (Unemployed)	68%	85%	52%
Family Configuration (Single Parent)	57%	61%	30%

Figure 4.3 presents a graph comparing the percentages of the two groups of youth experiencing the different types of socio-economic disadvantages. Class 1 represent youths ñLiving in Households Receiving Welfareò and class 2 represent those ñLiving in Households Not Receiving Welfareò.

Figure 4. 3. **The Profile of Youths: Welfare and Non-Welfare Receiving Class**



Note: *p<0.5; O.R. =Odds Ratios

According to the graph, youths being classified as living in welfare receiving households have higher likelihoods of being exposed to all types of familial socio-economic disadvantages. Mplus calculated the odds of each person in the sample being classified as ñLiving in welfare receiving householdsò versus ñLiving in non-welfare receiving householdsò. Because 100% of the participants belonging to class 1 reported receiving social security, Mplus did not produce the odds ratio for this item. For homeownership, a participant who was in welfare receiving household did not have a higher odds of living in rented housing than a non-welfare receiving

participant (O.R.=6.04, p>0.05). For the indicator of parental education, a participant classified as welfare receiving had 1.66 times greater the odds of ñhaving parents with low level of educationò than those being classified as non-welfare receiving (O.R.=1.66, p<0.05). Likewise, a participant who were in the welfare receiving group had 3.68 times greater the odds to be found ñliving with single parentsò (O.R.=3.68, p<0.05). A participant classified as welfare receiving was also 5.27 times higher in the odds to have ñunemployed parentsò (O.R.=5.27, p<0.05).

According to the results of the logistic regression, those classified as living in welfare receiving households had greater odds of endorsing the indicators of receiving social security, having low parental education, living in single parent family, and having unemployed parents than those classified as less poor. Although the odds ratio was not statistically significant for the observed variable of home ownership, I decided to retain it as a socio-economic indicator of childhood poverty because those classified as welfare receivers still had a higher percentage of living in rented housing than the non-welfare receivers (see Table 4.1). This direction supported the theoretical assumption that home ownership was an indicator of childhood poverty.

As such, childhood poverty in Hong Kong was operationalized as (1) Receiving social security; (2) Living in rented housing; (3) Having parents with low levels of education; (4) Having at least one unemployed parents; and (5) Having single parent. Results of this latent class analysis created a binary latent variable, childhood poverty (Welfare receivers=348; Non-welfare receivers=343), which was used in subsequent analysis to achieve Aim 2 and Aim 3 of this dissertation.

4.2. Aim 2. Examine the Psychological Consequences of Childhood Poverty

Data for this part of the dissertation was obtained from the longitudinal data set of the Child Development Fund Program. A total of 750 participants, 292 were males and 458 were females, with mean age of 13.83, were included in the analysis. The outcome variable of psychological health was time-varying, measured by the *General Health Questionnaires-12*. Information collected between Round 1, 3, 4 and 5 was used for this variable (see section 3.4.2 for details). Time-invariant binary independent variables were childhood poverty, the latent variable created in Aim 1, the experience of financial difficulty and parental perceived economic pressure. Covariates were menteesôgender and age at initial enrollment of the program. All these time-invariant independent variables and covariates were collected at baseline (see Section 3.4.1 for details).

Mutlilevel modeling was used to achieve this aim. Initial data analysis, exploratory data analysis and model diagnostic produces were performed prior to finalizing the multilevel level longitudinal model. For details of the data analysis plan used, please refer to Section 3.6.2 of this dissertation.

The following first discuss results of the initial data analysis, exploratory data analysis and model validation. Then, the major findings of this study are presented. Results partially support **hypothesis 2.3**, which stated that parental perceived economic pressure had negative effect on the psychological health of the youth living in poverty. Yet, the change in psychological health did not differ across those with high and low levels of parental economic pressure. In addition, findings did not support **hypothesis 2.1** and **hypothesis 2.2.** In conclusion, only perceived parental economic pressure was associated with psychological health of the youth, but not the childhood poverty and having experienced financial difficulty.

4.2.1. Initial Data Analysis, Exploratory Data Analysis and Model Validation

Initial Data Analysis. Initial data analysis, which involved univariate analysis and missing data analysis, was performed to check the quality of the outcome variable of psychological health in round 1, 3, 4 and 5. The following summarize results of the findings. For further details, please refer to the technical appendix of Aim 2 (See Appendix F).

Results of univariate analysis showed that the distribution of psychological health measured at all rounds resembled a bell shape curve, which suggested that a multiple multilevel regression could be used to analyze the data. In addition, there is a slight decrease in the mean scores of psychological from Round 1 to Round 5, suggesting the potential effect of time on the psychological health of participating youths.

Findings of missing analysis showed that missingness in psychological health were non-systematic in round 1 and round 3. However, missing data at round 4 and 5 did not occur at random. In round 4, missingness was associated with having experienced financial difficulty. In round 5, male participants, being older or living in single parent family, were associated with the missingness.

Exploratory Data Analysis. Exploratory data analysis, namely bivariate analyses and analyses informing model building procedures, were performed. The following provides a brief summary of the results of the exploratory data analysis. Please refer to the technical appendix of Aim 2 (See Appendix F) for details of the findings.

Results of bivariate analyses showed that the variables of participantsôinitial age at enrollment, gender, and perceived parental financial impact were associated with psychological health. Yet, childhood poverty and having experienced financial difficulty were not statistically significant predictors of psychological health. Because theories and literatures suggested that the

having experienced financial hardship and childhood poverty negatively affected psychological health, I decided to also retain them in subsequent analysis. Hence, all variables included as predictors of psychological health in the subsequent multilevel model.

Apart from bivariate analyses, additional exploratory analyses were taken to inform modeling building procedures. I assessed the need to establish multilevel models, compared the model fit statistics of the intercept varying and the slope varying model, and evaluated the model fit statistics of the linear and the quadratic model. Findings showed that a slope varying linear multilevel model should be established. As such, the final multilevel model was slope varying and linear in nature.

Model Validation. Model validation techniques were used to evaluate the performance of the final model. Results suggested that the assumption of homoscedasticity and normal distribution of error had been fulfilled. In addition, a close examination of the outliers showed that they were not problematic. Considering that the final model fulfilled the assumptions of multiple regression, it was adopted for interpretation. For details of the findings on model diagnostic, please refer to the technical appendix of Aim 2 (See Appendix F).

4.2.2. Effects of Childhood Poverty and Financial Difficulty on Psychological Health

The main effects model (Model 4.5), a linear slope-varying model, was established with the time-invariant independent variables of gender, initial age at enrollment, levels of childhood poverty, having experienced financial difficulty and perceived economic pressure (Table 4.2). This multilevel model established (Model 4.5) consisted of 670 participants spread across 7 time points.

Table 4. 2. Multilevel Model Estimates of Change in Psychological Health

	Model 4.0 (Null Model)			Model 4.5 (Main Effects Model)				Model 4.6 (Interaction Effects Model)			
	b	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**
Fixed Effects											
Intercept	30.82*	0.15	202.2	33.78*	33.78*	0.75	44.81	33.36*	33.36*	0.75	44.57
Time				-0.30*	-0.11*	0.05	-5.51	-0.25*	-0.11*	0.05	-5.27
Mentee (Female=1)				-0.75*	-0.07*	0.31	-2.42	-0.76*	-0.07*	0.31	-2.42
MenteeAge -14				-0.42*	-0.14*	0.08	-4.96	-0.42*	-0.15*	0.08	-4.95
Childhood Poverty (1=Poor)				-0.18	-0.02	0.30	-0.60	-0.18	-0.02	0.31	-0.59
Financial Difficulty (1=Yes)				0.11	0.01	0.32	0.35	0.11	0.01	0.32	0.45
Perceived Economic Pressure (1= Extremely high)				-1.65*	0.10*	0.53	-3.11	-1.63*	0.10*	0.92	-1.75
Time x Perceived economic pressure								-0.005	-0.00	0.15	-0.03
Random Effects	**σ^2**				**σ^2**				**σ^2**		
Intercept (Individual)	10.07				16.21				16.29		
Time					0.19				0.19		
Residual	16.77				15.31				15.29		
Model Fit	**-2LL**		**AIC**		**-2LL**		**AIC**		**-2LL**		**AIC**
	-6024		1205		-5696		11413		-5697		11417

Model Comparison	χ^2	**df**
Model Comparison 4.5 to 4.0	665*	8
Model Comparison 4.6 to 4.5	0.48	1

R^2

Level 1 R^2 for Model 4.5 =0.05

Level 2 R^2 for Model 4.5 =0.05

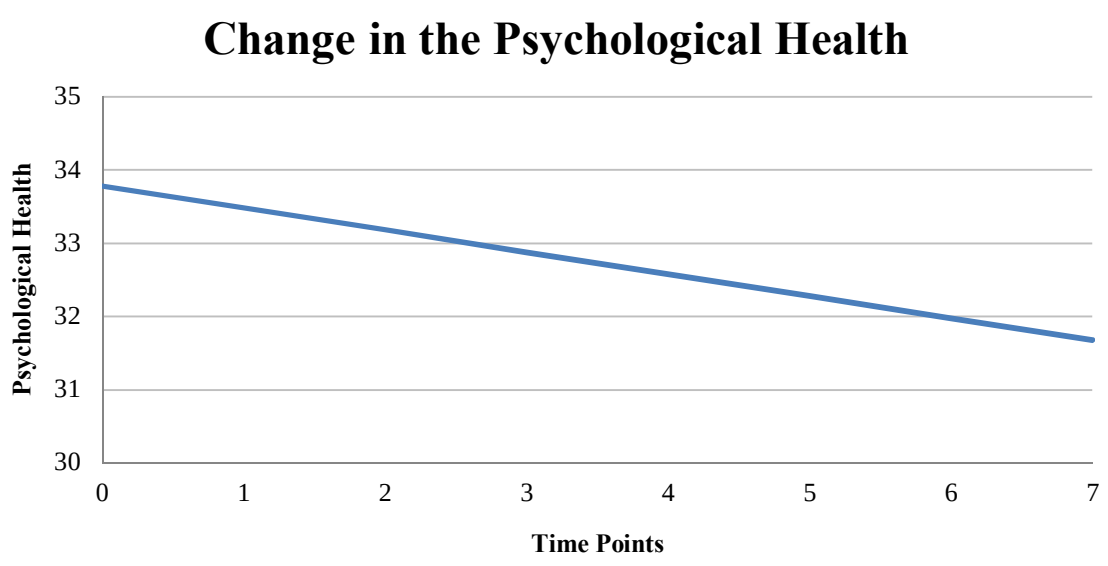
*p<0.05

Model Fit. Model comparison using ANOVA showed that Model 4.5 significantly differed from the null model, which suggested that the multilevel model showed a better fit than the null model (Table 4.2). Level 1 and Level 2 R^2 showed that the proportional reduction of error for predicting the outcome of each observation and individual mean were both 5 % (Table 4.2). Despite the small percentage of error reduction, variables in Model 4.5 explained some of the variance in the psychological health of the youth. The non-zero random effects indicated that some levels of inter-individual and intra individual variability were un-modeled (Table 4.2).

Main Effect Model. According to Table 4.2, the intercept was statistically significant and had a value of 33.78. This value suggested that the average score on the psychological health of a participant was 33.78 when all explanatory variables set at zero, except for age, which was centered at 14 years old.

Time had a negative effect on psychological health. Every two months, psychological health was expected to drop by a score of 0.3. Figure 4.4 is a description of the psychological trajectory of youths participating in the Child Development Fund Program. Although the trend was statistically significant, the effect of time was small, with a standardized beta of 0.11. As a result, we cannot see much change in the psychological health of the youths in the graph.

Figure 4. 4. Change in Psychological Health



The variable of parental perceived economic pressure was statistically significant. Those whose parents reported feeling extremely affected by economic hardship were expected to score 1.65 lower in terms of their psychological health than those with parents who reported feeling less affected. Yet, childhood poverty and having experienced financial difficulty was not associated with psychological health.

The covariates of gender and initial age at enrollment were also statistically significant independent variables. Female participants tended to score 0.75 unit lower than male participants in terms of psychological health. Participants who were one year older at the time of enrollment tended to score 0.42 unit lower in their psychological health overtime.

Interaction Effect Model. Cross level interaction between time and parental perceived economic pressure was added into the model to examine whether or not youths with high and low parental perceived economic pressure differed in their developmental

trajectories in psychological health over time (Table 4.2). Results of the interaction effect model (Model 4.6) showed that the change in psychological health did not differ across participants whose parents felt extremely pressured by their economic situation versus those who did not feel extremely overwhelmed. Model comparison using ANOVA also showed that the interaction effect model did not show a better fit than the main effect model. The main effect model (Model 4.5) was adopted as the model for subsequent analysis in Aim 3.

4.3. Aim 3. Explore How Mentoring Promotes the Psychological Health of Youths in Poverty

In order to achieve this aim, three hypotheses were formulated and three research questions were asked in this part of the study. The hypotheses were tested using the quantitative data from the Child Development Fund Program. The hypotheses were: **Hypothesis 3.1.** Mentoring relationship has a direct positive effect on the change in the psychological health of youth living in poverty. **Hypothesis 3.2.** Natural social relationships have direct positive effects on the changes in psychological health. **Hypothesis 3.3.** Natural social relationships mediate the positive effect of mentoring relationship on the psychological health of the youth living in poverty.

Research questions were answered using the qualitative information obtained from the School Based Mentoring Program. The research questions were: **Research Question 3.1**. What are positive psychological and social outcomes experienced by the mentees after participating in the mentoring program? **Research Question 3.2** What kinds of social resources are embedded in mentoring relationship? **Research Question 3.3.** How are these resources associated with different types of psychological health?

A mixed method research, featuring a parallel convergent design, was adopted to achieve this aim. Both quantitative and qualitative data were collected and analyzed separately, and the merging of the information occurred at the last stage. For details of the data analysis plan, please refer to Section 3.6.2 of this dissertation. The following first presents the quantitative findings, then the qualitative results. Finally, I discuss the merged results of the quantitative and qualitative study.

4.3.1. Quantitative Findings

Quantitative data was obtained from the Child Development Fund Program. Information on 750 participants (292 males and 458 females, mean age=13.83) of the Child Development Fund Program collected between Round 1, 3, 4 and 5 was employed. All time-varying variables were obtained from round 3, 4 and 5 of the data collection process. Outcome time-varying variable was psychological health. Time-varying independent variables were mentoring relationship, parent-child relationship, family network size and peer network size. The reason for omitting Round 1 and 2 was that the outcome variable of General Psychological Health was missing in Round 2, and the independent variable of mentoring relationship was missing in Round 1.

Time-invariant covariates were mentoring relationship, childhood poverty, financial difficulty, parental perceived economic pressure, participantsô gender, age at initial enrollment and psychological health measured at baseline. Table 4.3 summarizes the variables used in each data rounds.

Table 4. 3. Variables and Rounds of Data Used

Variables	Rounds of Data Used
Time-varying variable	
Outcome	
Psychological Health	3, 4, & 5
Independent Variables	
Mentoring Relationship	3, 4, & 5
Parent-child Relationship	3, 4 & 5
Peer Network Size	3, 4 & 5
Family Network Size	3, 4 & 5
Time-invariant variable	
Covariates	
Mentoring Relationship	2
Childhood Poverty	1
Financial Difficulty	1
Perceived Parental Economic Pressure	1
Psychological Health	1
Gender	1
Age	1

4.3.1.1. Initial Data Analysis, Exploratory Data Analysis, and Model Validation

Initial Data Analysis. The initial data analyses of univariate analysis, bivariate analysis and missing analysis were performed to check the quality of the variables of psychological health, mentoring relationship, parent-child relationship, peer network size and family network size. The following summarized the results. For details, please refer to the technical appendix for Aim 3 (see Appendix G).

Initial Data Analysis: Univariate Analysis. Univariate and graphical analysis showed that the variables of psychological health, mentoring relationship and parent-child relationship were normally distributed, whereas the variables of peer network size and family network size were negatively skewed.

Participantsôaverage scores on their psychological health, mentoring relationship, and parent-child relationship all show slight decreases between Round 3 and Round 5. For mentoring relationship, there was even a sharp fall in the participantsôscores at Round 5 (i.e, the average score dropped from 99 at Round 3 to 93 at Around 5). The relatively large percentage of participantsôdrop out in Round 5 may account for such a remarkable decrease in the average score on mentoring relationship: participants stayed in the program might be those were not doing well, and thus needed more help. For family and peer network size, the number of family members and peers whom the participants could count on remained stable over time.

Initial Data Analysis: Bivariate analysis. Bivariate analysis was conducted to understand whether or not participants of dissimilar familial socio-economic backgrounds and personal characteristics differed significantly in their quality of social relationships. Results of showed that the socio-economic backgrounds of the participants were not associated with their mentoring relationship, parent-child relationship, family and peer network size. For gender, female participants tended to have score higher on their quality of parent-child relationship and have larger peer network than male mentees. Menteesôage at enrollment to CDF was negatively associated with mentoring relationship in Round 3, 4 and 5, and it correlated negatively with parent-child relationship and family network size in all rounds of data. Yet, age showed a positive relationship with peer network size in all 5 rounds.

Initial Data Analysis: Missing Data Analysis. Missing data analysis was then conducted to examine whether or not missingness in these variables occurred at random. Results showed that missingness occurred systematically. In particular, missingness in Round 4 for all variables were related to having experienced financial difficulty,

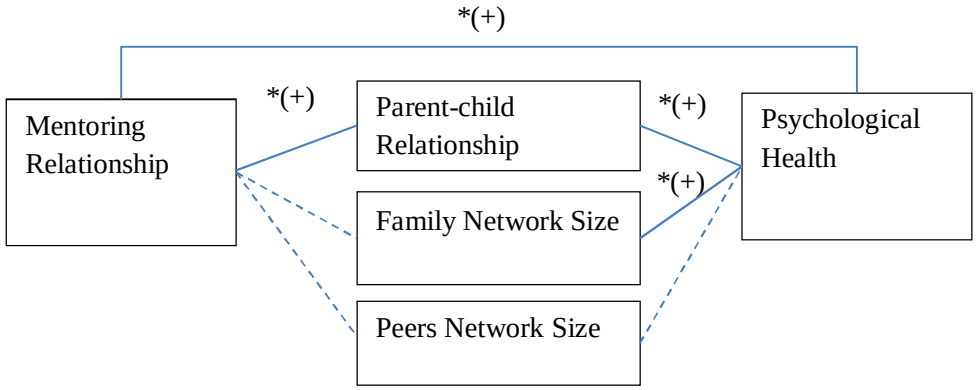
and missingnesss in Round 5 for all variables were associated with participantsôgender, age and family configuration (i.e., living with single parent).

Exploratory Data Analysis. Exploratory data analyses of correlation analysis and model building procedures were performed to inform model development. The following provided a brief summary of results of the exploratory data analysis. For details, please refer to the technical appendix of Aim 3 (See Appendix G).

Exploratory Data Analysis: Correlation analysis. Correlation analysis were conducted to test the strength of associations between **(1)** psychological health, mentoring relationship and parent-child relationship, **(2)** psychological health and different types of social network size, and **(3)** Mentoring relationship and different types of social network size. Pearson correlation was used to test the associations between psychological health, mentoring relationship and parent-child relationship. Spearman correlation was used to examine the associations between psychological health, peer network size, and family network size as well as the associations between mentoring relationship, peer network size, and family network size. Data between round 3 and 5 was used.

Figure 4.5 summarizes the relationships between psychological health, mentoring relationship, parent-child relationship and family network size for data from Round 3 to 5. Peer network size showed no statistically significant associations with psychological health and mentoring relationship, therefore, this variable was not included in the figure. For further details, please refer to the technical appendix of Aim 3.

Figure 4. 5 Associations between Mentoring Relationship, Parent-child Relationship, Family Network Size and Psychological Health



*p<.05
Note: (+) = Positive correlations between the variables in round 3, 4 & 5 of the data

Hypothesis 3.2 and 3.3 were revised based on results of the correlation analysis. Findings showed that mentoring relationship, parent-child relationship and family network size could be predictors of in psychological health of youths living in poverty. In addition, because parent-child relationship was both associated with mentoring relationship and psychological health, it could serve as a mediator. As such, hypotheses 3.2 and 3.3 were revised: **Hypothesis 3.2.** Parent-child relationship and family network size have direct positive effects on the change in psychological health of youths living in poverty. **Hypothesis 3.3.** Parent-child relationship mediates the positive effect of mentoring relationship on the psychological health of youths living in poverty.

Exploratory Data Analysis: Model Building. Five multilevel models were established in this quantitative part of the study. I first established a baseline model describing the changes in psychological health from round 3 to 5 using the variables of childhood poverty, having experienced financial difficulty, parental perceived

economic pressure and participantsô characteristics (Model 4.13). I established this model with a view to comparing subsequent multilevel models with this baseline model. I then tested the direct effect of mentoring relationship on the change in psychological health over time (Model 4.14). I also examined the direct effects of parent-child relationship and family network size on the changes in psychological health, controlling for mentoring relationship (Model 4.15). To test the indirect effect, I first examined the effect of parent-child relationship on psychological health, controlling for mentoring relationship (Model 4.16). Last, I tested the effect of mentoring relationship on parent-child relationship (Model 4.17).

The first four models (from Model 4.13 to Model 4.16) used psychological health as the outcome variable and the last one (Model 4.17) used parent-child relationship as the outcome variable. As such two null models were established: one with psychological health as the outcome variable (see Appendix G, Table G.19) and the other with parent relationships as the outcome variable (see Appendix G, Table G.20).

Findings of this exploratory analysis showed that an intercept varying linear multilevel model should be established to model the change in psychological health. As for parent-child relationship, a slope varying linear multilevel model was suitable. For further details, please refer to the technical appendix of Aim 3 (Appendix G).

Model Validation. Model validation techniques were used to evaluate the performance of the model (Model 4.14, Model 4.15, Model 4.16 and Model 4.17). Results suggested that the assumptions of homoscedasticity and normal distribution of error of all these models were fulfilled. In addition, the outliers were not problematic. For details of the findings, please refer to the technical appendix for Aim 3 (Appendix G).

4.3.1.2. Direct Effect of Mentoring on Psychological Health (Model 4.14)

In this section, I present findings on the direct effect of mentoring relationship on the change in psychological health of youths living in poverty (**Hypothesis 3.1**). The analysis consists of 430 participants spreading across 7 time points. Table 4.4 presents Model 4.14, which shows the effect of mentoring relationship on psychological health, Model 4.13, which is the baseline model omitting the variable of mentoring relationship, and Model 4.7, which was the null model.

Model comparison using ANOVA showed that Model 4.14 significantly differed from the null model, which suggested that the multilevel model was statistically significant (Table 4.4). Level-1 and Level-2 R^2 showed that the proportional reduction of error for predicting the outcome of each observation and the mean of each individual participant were both 12 % and 13 % respectively (Table 4.4). The non-zero random effects suggested that some levels of inter-individual and intra individual variability were un-modeled (Table 4.4).

Table 4. 4 . Multilevel Model Estimates of Effects of Social Relationships on the Change in Psychological Health

	Model 4.7 (Null Model)			Model 4.13 (Baseline Model)				Model 4.14 (Reduced Model)				Model 4.15 (Full Model)			
Fixed Effects	**b**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**
Intercept	30.53*	0.15	191.4	23.19*	23.19*	2.11	10.97	32.03*	32.03*	1.24	25.66	32.55*	32.55*	1.31	24.82
Time				-0.25*	-0.06*	0.11	-2.22	-0.25	-0.06	0.13	-1.88	-0.08	-0.02	0.15	-0.51
Mentee (Female=1)				-0.56	-0.05	0.36	-1.56	-0.42	-0.04	0.45	-0.93	-1.43*	-0.13*	0.48	-2.95
MenteeAge -14				-0.18	-0.07	-0.09	-1.86	-0.20	-0.07	0.12	-1.68	-0.07	-0.02	0.13	-0.51
Levels of Childhood Poverty (1=Poor)				0.39	0.04	0.35	1.11	0.29	0.03	0.44	0.65	0.01	0.00	0.46	0.03
Having Experienced Financial Difficulty				0.29	0.03	0.37	0.77	0.31	0.03	0.47	0.65	-0.00	-0.00	0.50	-0.00
Perceived Economic Pressure (1= Extremely high)				-1.56*	0.07*	0.55	-2.81	-1.15	-0.06	0.83	-1.38	-0.60	-0.04	0.83	-0.71
Psychological Health (Baseline)-32				0.36*	0.38*	0.03	11.15	0.33*	0.35*	0.04	8.13	0.26*	0.29*	0.04	5.92
Mentoring relationship (Baseline)-101								-0.01	-0.02	0.02	-0.34	-0.00	-0.01	0.01	-0.16
Parent-child relationship(Baseline)-50												0.01	0.01	0.04	0.24
Family Network Size (Baseline)												0.28	0.06	0.23	1.24
Mentoring relationship-98								0.03*	0.09*	0.01	2.25	0.01	0.02	0.01	0.53
Parent-child relationship- 47												0.15*	0.20*	0.04	4.12
Family Network Size												0.53*	0.08	0.20	2.58

Random Effects	σ^2	σ^2	σ^2	σ^2
Intercept (Individual)	9.24	5.70	8.04	7.89
Residual	16.08	16.36	14.70	12.17

Model Fit	**-2LL**	**AIC**	**-2LL**	**AIC**	**-2LL**	**AIC**
	-2956	5932	-2069	4162	-1609	3249

Model Comparison	χ^2	**df**
Model 4.14 to Model 4.7	4812*	9
Model 4.15 to Model 4.14	919*	3

	Model 4.14	**Model 4.15**
Level 1 R^2	0.12	0.21
Level 2 R^2	0.13	0.21

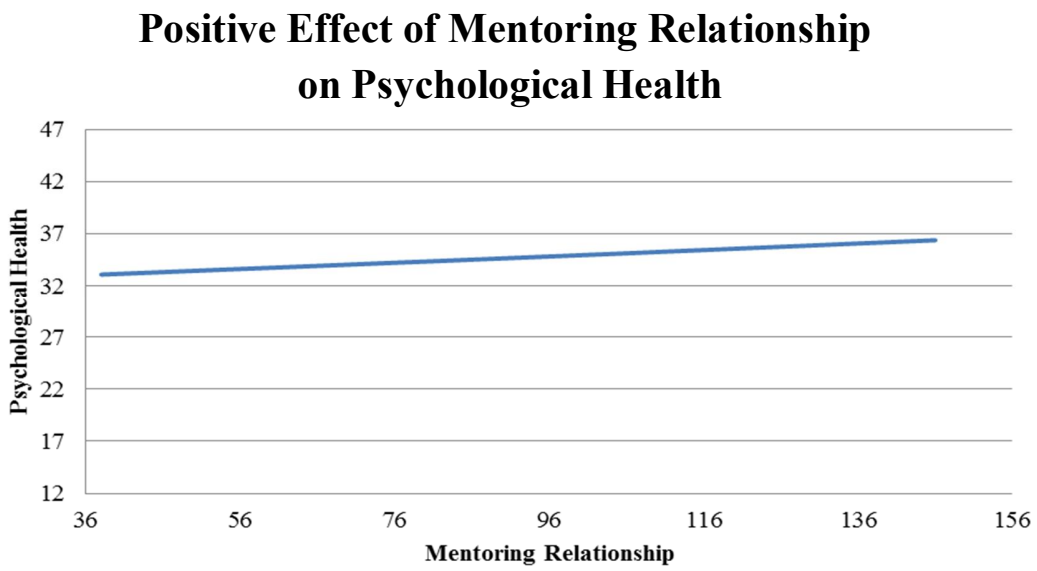
*p<0.05

Main Effects. For Model 4.14, the estimate for the intercept was 32, which meant that the expected value of psychological health was 32 when all independent variables had a value of zero, except for the time varying variable of mentoring relationship and the time invariant variable of mentee age, psychological health measured at baseline and mentoring relationship measured at baseline, which were centered at mean.

Independent Variable: Time. Time was not a significant predictor (b=0.24), showing that change in the psychological health of the participants over time was not statistically significant. Because time was not a significant predictor, I did not test the interaction effect between time and mentoring relationship on psychological health as proposed in Chapter 3.

Independent Variable: Mentoring relationship. Mentoring relationship was positively associated with psychological health. For every unit of increase in mentoring relationship, psychological health was expected to increase by 0.03 points. Figure 4.6 illustrated the linear association between mentoring relationship and psychological health. Although the association between psychological health and mentoring relationship was statistically significant, the effect was considered small, with a standardized beta of 0.09.

Figure 4. 6 **Positive Effect of Mentoring Relationship on Psychological Health**



Covariates: Childhood Poverty, Having Experienced Financial Difficulty and Perceived Parental Economic Pressure. The covariates of childhood poverty, having experienced financial hardship and parental perceived economic pressure were not statistically significant. Interestingly, before the effect of mentoring relationship was added into the model, the coefficient of perceived parental economic pressure was a statistically significant (see Model 4.13). Mentoring relationship took away the statistically effect of parental perceived economic pressure on psychological health.

Covariates: Gender, Age and Psychological Health at Baseline. For the effects of demographic variables, gender and initial age at enrollment were not significant predictors. Last, the confounding variable of psychological health measured at baseline was statistically significant. For every unit of increase in psychological health at enrollment, psychological health was expected to increase by 0.33 units.

4.3.1.3 Direct Effects of Parent-child relationship and Family Network Size on Psychological Health (Model 4.15)

In this section, I present findings of the direct effects of the natural relationships of parent-child and family network size on psychological health, controlling for mentoring relationship (Table 4.4). This model consists of 300 participants spreading across 7 time points.

Model Fit. Model comparison using ANOVA showed that Model 4.15 significantly differed from Model 4.14, which indicated that this multilevel model showed a better fit (Table 4.4). Level-1 and Level-2 R^2 showed that the proportional reduction of error for predicting the outcome of each observation and the mean of each individual participant were both approximately 21% (Table 4.4). The relatively large reduction in error in Model 4.15 (i.e. 21%) comparing to Model 4.14 (i.e., 12% to 13%) told us that parent-child relationship explained additional variance in psychological health. The non-zero random effects also suggested that some levels of inter-individual and intra individual variability were un-modeled (Table 4.4).

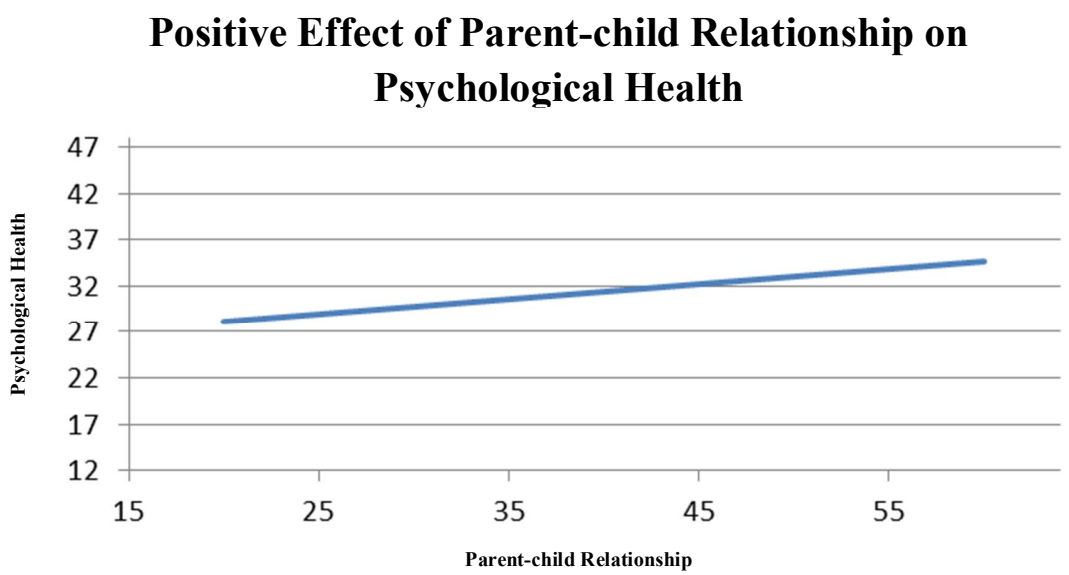
Main Effects. For Model 4.15, the estimate for the intercept was 32.55, which meant that the expected value of the scores of psychological health was 32.55 when all independent variables adopted a value of zero, except for the time varying variables of mentoring relationship and parent-child relationship, as well as the time invariant variables of mentee age, psychological health and mentoring relationship measured at baseline, which were centered at mean.

Independent Variable: Time. The coefficient of time was not a statistically significant, indicating that the psychological health of the participants did not change over time. Interestingly, in the baseline model (Model 4.13), when the effects of

mentoring relationship, parent-child relationship and family network size were not included, time was significantly associated with psychological health. After the variables, parent-child relationship, family network size and mentoring relationship, were added into the regression analysis, the beta value of time dropped from 0.3 ($p<0.05$) to 0.08 ($p>0.05$). The decrease in the strengths of association suggested that relationships might have taken away the negative effect of time on psychological health. Because the coefficient of time was not statistically significant, the interaction effect between time and different types of relationships on psychological health was not tested.

Predictors: Parent-child relationship and Family Network Size. Parent-child relationship was a significant predictor of psychological health, with a standardized beta of 0.2, which was considered a moderate effect size. Every unit of increase would result in an expected increase of 0.16 unit in psychological health. As for family network size, it was not a significant predictor. Figure 4.7 is a graphical depiction on the linear association between parent-child relationship and psychological health.

Figure 4. 7 **Effect of Parent-child Relationship on Psychological Health**



Covariate: Mentoring relationship. The beta value of the time-varying variable of mentoring relationship was not statistically.

Covariates: Childhood Poverty, having experienced financial hardship and perceived parental economic pressure. The indicators of childhood poverty, having experienced financial hardship and parental perceived economic pressure did not predict psychological health in Model 4.15. When I compared the beta value of parental perceived economic pressure in Model 4.13 with that in Model 4.15, the effect of parental perceived economic pressure was statistically significant in Model 4.13, but not in Model 4.15. Such findings provided additional evidence of the positive effect of parent-child and family relationships on the psychological health of youth living in straitened circumstances.

Covariates: Gender and Age. Female participants scored 1.43 lower than male participants in their psychological health. Initial age at enrollment was not a statistically significant predictor.

Covariates: Baseline measures of Psychological Health, Mentoring relationship, Parent-child relationship and Family Network Size. The confounding variable of psychological health measured at baseline was statistically significant. For every unit of increase in psychological health measured at baseline, psychological health was expected to be 0.26 unit higher. Yet, the time-invariant variable of mentoring relationship, parent-child relationship and family network size measured at baseline was not significantly associated with psychological health of the youth.

4.3.1.4. Indirect Effect of Mentoring relationship on Psychological Health

To test the indirect effect of mentoring relationship on psychological health as mediated by parent-child relationship, Baron and Kenny (1986) model of mediation analysis was used (See Chapter 3, Section 3.6.3).

In order to confirm the role of parent-child relationship as a mediator, the following steps needed to be taken. **Step 1:** Variations in mentoring relationship (independent variable) significantly accounted for the variations in psychological health (outcome variable). **Step 2:** Variations in parent-child relationship (mediator) significantly accounted for variations in psychological health (outcome variable). **Step 3:** Variations in mentoring relationship (independent variable) significantly accounted for the variations in parent-child relationship (mediator). **Step 4:** When parent-child relationship (mediator) were controlled, the effect of mentoring relationship (independent variable) on psychological health (outcome variable) was smaller than that in the model established in step 1.

Model 4.16 (Table 4.5) and Model 4.17 (Table 4.6) were established for this mediation analysis. Time-varying variables were psychological health, mentoring relationship and parent-

child relationship. Time-invariant variables were childhood poverty, financial difficulty, parental perceived economic pressure, gender, initial age at enrollment, mentoring relationship measured at round 2 and psychological health measured at baseline.

Table 4. 5. Multilevel Model Estimates of Effects of Mentoring and Parent-child relationship on Psychological Health

	Model 4.7 (Null Model)			Model 4.14 (Baseline Model)				Model 4.16 (Mediated Model)			
Fixed Effects	**b**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**
Intercept	30.53*	0.15	191.4	32.03*	32.03*	1.24	25.66	31.24*	31.24*	1.24	25.14
Time				-0.25	-0.06	0.13	-1.88	-0.03	-0.01	0.14	-0.23
Mentee (Female=1)				-0.42	-0.04	0.45	-0.93	-1.08*	-0.10*	0.47	-2.32
MenteeAge -14				-0.20	-0.07	0.12	-1.68	-0.17	-0.06	0.12	-1.45
Levels of Childhood Poverty (1=Poor)				0.29	0.03	0.44	0.65	0.27	0.03	0.44	0.63
Having Experienced Financial Difficulty				0.31	0.03	0.47	0.65	0.17	0.01	0.47	0.37
Parental perceived economic pressure				-1.15	-0.06	0.83	-1.38	-0.75	-0.04	0.82	-0.92
Psychological Health (Baseline) -29				0.33*	0.35*	0.04	8.13	0.28*	0.30*	0.04	6.55
Mentoring relationship (Baseline)-101				-0.01	-0.02	0.02	-0.34	-0.02	-0.06	0.01	-1.46
Parent-child relationship(Baseline)-50								0.03	0.05	0.03	0.98
Mentoring relationship-98				0.03*	0.09*	0.01	2.25	0.02	0.06	0.01	1.57
Parent-child relationship-47								0.16*	0.21*	0.03	4.72
Random Effects	**σ^2**			**σ^2**				**σ^2**			
Intercept (Individual)	9.24			8.04				7.75			
Residual	16.08			14.70				13.65			
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**			**-2LL**	**AIC**		
	-2956	5932		-2069	4162			-1963	3954		
						χ^2	**df**				
Comparison of Model 4.7 to Model 4.14						4811*	9				
Comparison of Model 4.14 to Model 4.16						221*	2				

*p<0.05

Step 1. For step 1 of the mediation analysis, I already tested the direct effect of mentoring relationship on psychological health in Model 4.14 (Table 4.5). The statistically significant effect of mentoring relationship on psychological health (b=0.03) provided an effect for parent-child relationship to mediate on. As such, step 1 of the mediation analysis was fulfilled.

Step 2. In step 2, I tested the effect of parent-child relationship on psychological health, controlling for mentoring relationship (Table 4.5, Model 4.16). This model consisted of 309 participants spread across 7 time points. Model comparison using ANOVA showed that Model 4.16 significantly differed from Model 4.15, which denoted that Model 4.16 showed a better fit (Table 4.5). The non-zero random effects also suggested that some levels of inter-individual and intra individual variability were un-modeled (Table 4.5).

For Model 4.16, the beta value of parent-child relationship was statistically significant after controlling for mentoring relationship, which provided evidence supporting its mediating role. For every unit of increase in parent-child relationship at every time point, psychological health was expected to increase by 0.16 unit.

The beta value of the time-varying variable of mentoring relationship was not statistically significant. In contrast to Model 4.14, the statistical effect of mentoring relationship disappeared when parent-child relationship was added into the model. Such a result implied the mediating role of parent-child relationship.

For other parameters, the estimate for the intercept was 31.24, which meant that the expected value of the scores of psychological health was 31.24 when all independent variables had a value of zero, except for the time varying variable of mentoring relationship and parent-child relationship, and the time invariant variable of mentee age, mentoring relationship and psychological health measured at baseline, which were centered at mean. Time was a not a significant predictor, suggesting that the psychological health of the participants did not change over time. Female participants scored 1.08 unit lower than male participants in their psychological health. Initial age at enrollment was not a significant predictor. The indicators of childhood poverty, having experienced financial hardship and perceived parental economic

pressure were not associated with psychological health. Last, the confounding variable of psychological health measured at baseline was statistically significant. For every unit of increase in psychological health measured at baseline, the psychological health of the youths was expected to be 0.28 unit higher over time.

Step 3. In step 3, the effect of mentoring relationship on parent-child relationship was tested. Table 4.6 presented results of the multilevel model on the effects of mentoring relationship on parent-child relationship (Model 4.17). The final model had 313 participants involved in it, across 7 time points. Model comparison using ANOVA showed that Model 4.17 significantly differed from the null model (Model 4.10), which showed that the multilevel model showed a better fit (Table 4.6). The non-zero random effects also suggested that some levels of inter-individual and intra individual variability were un-modeled (Table 4.6).

According to Model 4.17, the estimate for the intercept was 42.87, which meant that the expected value of the scores of parent-child relationship was 42.87 when all independent variables assumed a value of zero, except for mentee age and baseline parent-child relationship, which were centered at mean.

The negative value of the parameter of time showed that the quality of parent-child relationship of the participants deteriorated over time. For every unit of increase in time, parent-child relationship was expected to decrease by 1.34 unit.

Mentoring relationship was positively associated with parent-child relationship. For every unit of increase in mentoring relationship, parent-child relationship was expected to increase by 0.04 unit.

Childhood poverty and having experienced financial difficulty were not associated with parent-child relationship. On the other hand, youths with high levels of parental perceived

economic pressure had poorer parent-child relationship than those with low levels of parental economic pressure.

For the effects of demographic variables, female participants scored 1.31 higher than male participants on their parent-child relationships. Age was not associated with parent-child relationship. Last, the confounding variable of parent-child relationship measured at baseline was statistically significant. For every unit of increase in parent-child relationship measured at baseline, the parent-child relationship of the youths were expected to be 0.39 unit higher over time. Mentoring relationship measured at baseline was not statistically significant.

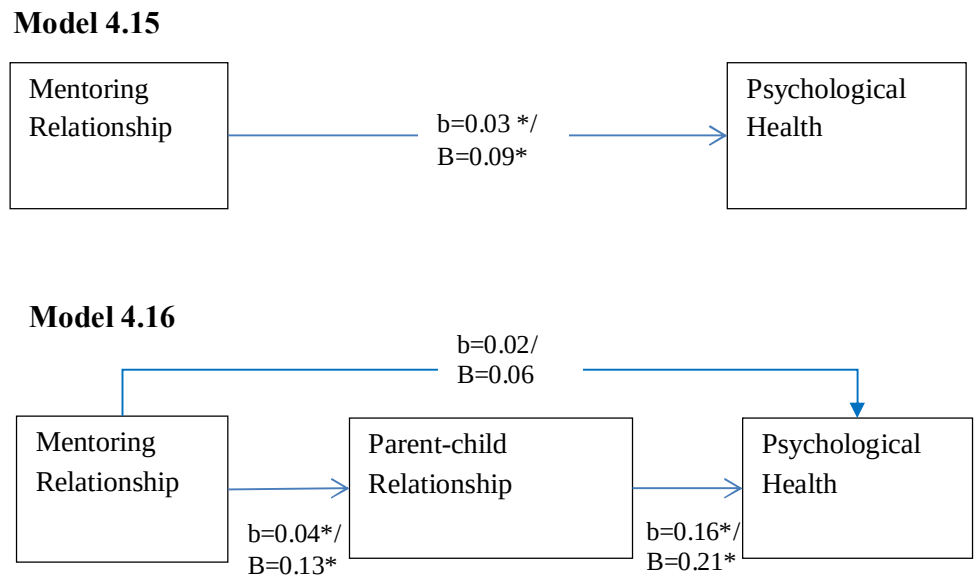
Table 4. 6. Multilevel Model Estimates of Effects Mentoring relationship on Parent-child Relationship

	Model 4.10 (Null Model)			**Model 4.17 (Full Model)**			
Fixed Effects	**b**	**S.E.**	**t**	**b**	**B**	**S.E.**	**t**
Intercept	54.33*	0.61	212.3	42.87*	42.87*	2.51	17.04
Time				-1.34*	-0.24*	0.15	-9.02
Mentee (Female=1)				1.31*	0.10*	0.57	2.26
MenteeAge-14				0.01	0.00	0.15	0.10
Childhood Poverty (1=Poor)				0.07	0.00	0.56	0.12
Having Experienced Financial Difficulty (1=Yes)				1.14	0.08	0.59	1.92
Parental perceived economic pressure				-3.01*	-0.13	1.02	-2.94
Mentoring relationship				0.04*	0.13*	0.01	3.73
Parent-child relationship(Baseline)				0.39*	0.43*	0.04	10.09
Mentoring relationship (Baseline)				0.01	0.03	0.02	0.73
Random Effects	**σ^2**			**σ^2**			
Intercept (Individual)	22.59			24.24			
Time				0.35			
Residual	17.96			17.00			
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**		
	-4720			-2126	4280		
	9605						
				χ^2	**df**		
Model Comparison Model 4.17 to Model 4.10				5181	8		

*p<0.05

Step 4. In this last step, I compared the parameter estimates of mentoring relationship on Model 4.15 and Model 4.16. When I compared the parameter estimates of mentoring relationship in Model 4.1.6 (b=0.02, p>.05) with the estimates of mentoring relationship in Model 4.15 (b=0.03; p<.05), the parameter estimate in Model 4.15 was statistically significant, but not for Model 4.16. According to Baron and Kenny (1986) conceptualization of mediating analysis, findings confirmed the mediating role of parent-child relationship on the effect of mentoring relationship on psychological health. Figure 4.8 summarized the findings of the mediation analysis.

Figure 4. 8 Mediating Role of Parent-child Relationship



*p<.05
Note: b=Partial betas adjusting for all the covariates in Table 4.5 and 4.6
B=Standardized betas adjusting for all the covariates in Table 4.5 and 4.6

4.3.2. Qualitative Findings

Qualitative interviews were analyzed. A theory driven thematic analysis approach was used to analyze the qualitative data. This part of the study answered the following research questions: **Research Question 3.1**. ñWhat are positive psychological and social outcomes experienced by the mentees after participating in mentoring programs?ò, **Research Question 3.2** **"**What kinds of social resources are embedded in mentoring?ò and **Research Question 3.3.** **"**How are these resources associated with different types of psychological health?ò

Table 4.7 summarizes the categories I identified in the qualitative interviews. Compared with Table 2.1, the categories of ñmotivationò and ñencouragementò were added. The categories of ñexpansion in social networksò and ñexpectationsò were dropped. In addition, ñcharacteristics of high quality mentoringò and ñBarriers to high quality mentoringò emerged as new themes when I was analyzing the qualitative information.

Table 4. 7. Categories identified in the Qualitative Interviews

Categories	Definitions
Improvement in Psychological Health	Increase in positive affect Enhanced levels of self-confidence Higher levels of motivations
Improvement in Existing Relationships	Family Relationships: Higher levels of sharing Peer Relationships: Enlarged social circle; Lower levels of conflict with peers
Social Resources Embedded in Mentoring relationship	Companionship Direct advice; Role modeling; Encouragement
Characteristics of High Mentoring Quality	Adult- Friend Role of Mentors; Trust ; Felt Importance
Barriers to High Mentoring Quality	Perceived low availability of mentor

4.3.2.1 Improvement in Psychological Health

The following describes the positive psychological changes experienced by the mentee after they participated in the School Based Problem Solving Skills Mentoring Program. The categories of ñpositive affectò, ñself-confidenceò and ñmotivationò in the qualitative information are identified.

Improvement in the Psychological Health: Positive Affect. One of the strongest themes found in the interviews was the change in positive affect reported by the mentees. Nineteen out of the twenty-two mentees interviewed indicated having experienced positive changes in their moods after they meet their mentors. ñFeeling Happierò was repeatedly identified in the interviews. Another repetitive theme was better emotional regulation. Phases often used by mentees were ñbetter at controlling my temperò, and ñbetter at controlling my negative emotionsò. While both male and female mentees suggested that they felt happier after joining the program, male students tended to state that they experienced less temper tantrums and were better at controlling themselves.

Mentee #04 (male) consistently stated that he felt ñhappierò, more ñcalmò and was ñbetter at controlling my negative emotions and temperò. His mentor, #M_04, also indicated that his mentee showed improvement in his emotion regulations. ñHe seems to be better at controlling his emotions. é When we first met, he told me that he consistently fought with his friends. At least now, he has not told me that he is experiencing negative emotions at school.ò Mentee #10 (male) also expressed that he was ñmore optimisticò, ñfeel happierò and ñhave better temperò. On the other hand, his mentor, #M_10, did not indicate that he noticed any changes in his menteeôs moods.

Mentee #03 (female) stated that she felt ñbetterò, ñhappierò and ñnot being stuck by my problemsò after meeting her mentor. Her mentor, M_#03, observed that her mentee was better at controlling her temper, ñwhen she feels angry now, she will walk away to calm herself down, instead of just showing her temper at the beginningò The mentor also stated that she (mentee) ñlooks happier because she (mentee) is willing to accept that she is not perfectò.

Mentee #11 (female) expressed that ñMy mentor makes me feel so much happierò and ñI feel really happy in the past six months after knowing my mentorò. Yet, her mentor, #M_11, stated that her mentee ñhas always been stable, and there is not a lot that she (mentor) can help her because the mentee has always been optimistic and cheerfulò.

Improvement in Positive Psychological Health: Self-confidence.

Another common category identified in the interviews was ñself-confidenceò. Seven out of twenty two of the mentees indicated that they experienced increases in their self-confidence after participating in the mentoring program. The code ñconfidenceò was consistently spotted. Other codes were ñfeeling better about myselfò and ñsense of achievementò.

Mentee #02 (male) stated that he ñfeel better about myselfò when compared to his peers because his mentors always taught him a lot of new things that his peers failed to give him. His mentor was not available for interviews. Mentee #10 (male) said that he ñfeel more confident in learning Englishò. His mentor , #M_10, also observed that the mentee was more willing to voice his opinions. Mentee #14 (male) stated that he felt ñmore confident nowò. His mentor, #M_14, also stated that his mentee (Mentee #14) seemed to be ñmore confidentò and was ñmore openò than before.

Mentee #01(female) expressed, ñI feel a sense of achievement (because of better grades).ò On the other hand, the mentor observed mentee #01 as being more ñsecureò and ñis more willing

to trust other peopleò. Mentee #09 (female) stated, ñI feel more confident in trying é one of my attempt is to become a prefect at my school.ò Her mentor, #M_09, also observed that her mentee was more willing to try than before.

Improvement in Positive Psychological Health: Motivations. A new and unexpected category emerging from the interviews was the increased level of motivations experienced by the mentees. Eight out of twenty-two of the mentees indicated enhancement in their motivations. This theme was identified with the codes ñfeel more determinedò, ñhaving clearer goalsò and ñwilling to tryò. Mentee # 16 (male) said, ñI learn from my mentor that one needs to try, try really hard before he can succeed.ò Mentee # 09 (female) expressed, ñI should also try harderò. Mentee #11 (female) stated that she ñhas a clearer goal nowò. However, all mentors of these mentees did not see clearly this kind of positive psychological change in their mentees.

4.3.2.2. Improvements in Family and Peer Relationships

The following describe the positive changes in the menteesô relationships with their families and friends. For family relationships, mentees consistently expressed that improvements in their family relationships made them happier than before. For peer relationships, those who expressed having enlarged peer circles also have experienced a positive change in their affect. Yet, those who have experienced better peer relationships owing to lower levels of conflict did not associate such a change with their improved affect.

Improvement in Family Relationships: Higher Levels of Sharing. Four of the mentees expressed that their mentors helped them open up themselves in front of their parents. Three out of four of the mentees who had experienced improvements in their familial relationships were girls. Two of the male mentees (Mentee #08 and Mentee #14)

explicitly indicated that ñthere is no need to tell their mentors about their family problems.ò All mentees who had experienced a change in their positive family relationships stated that such changes made them feel ñbetterò and ñhappierò or ñcalmerò. The codes of ñbetter relationshipsò, ñtalking moreò and ñsharing moreò with families or parents were identified.

Mentee #04 (male) indicated that he felt ñmore calm with my familyò after he ñstarted to change his attitude (telling his mother that she was wrong about him when she accused him wrongly).ò His mentor, M_#04, also observed improvement in his menteesô relationships with his mother, he said, ñI think he is better at interacting with his family now. There was one time when he called me, and his mother was nagging him for using the phone, he calmly explained that he was on the phone with me. I find that his relationship with his mother is better.ò

Mentee #01 (female) said, ñI open up and I feel that my family is really good now.ò Her mentor, M_#01, also indicated that after listening to her menteeôs familial problems and sharing her own experience with her mentee, she felt that her mentee became more secured. Yet, the mentor expressed that there was still ña distance between her [mentee] and her motherò, and therefore, ñseldom shares her problems with her motherò.

Mentee #18 (female) stated, ñAfter I share my problems with my family, I feel better. My mother pays more attention to the problematic issues (i.e., the mother always talking loudly to her at home, which bothers the mentee a lot) and she tries to control her voice now.ò Her mentor, M_#18, also said that she helped improve her menteeôs family problems by offering her different effective ways to communicate with her mother.

Improvement In Peer Relationships: Enlarged Peer Circle with High Levels of Sharing. Having a larger peer circle was a recurrent theme identified in the interviews. Twelve out of twenty two mentees expressed that their peer circles were enlarged

after participating in the program. Most mentees who had experienced positive changes in their peer relationships owing to enlarged peers circle claim that such changes really caused them to feel happier. The code of ñtalking more with friendsò was the most common one identified.

Mentee #04 (male) stated that his mentor encouraged him to interact with his friends in person rather than on the phone. He felt ñhappierò and said, ñtalking with people face to face feel much better than interacting with them through text messages.ò Yet, his mentor, M_#04, did not recall noticing any change in his menteesô peer relationships.

Mentee #15 (male) recalled, ñI take initiative in knowing people now, and I feel happier, because there are more people that I can talk to.ò The mentor of mentee #15 did not participate in the interview because he was out of the city.

Mentee #03 (female) expressed, ñBefore joining the program, I seldom talked with my school mates. Now, we talk more, and we use whatôs app (an online communication platform) to communicate. Also we hang out a lot, which makes me feel happier.ò Her mentor, M_#03, said she was not able to observe remarkable changes in her menteeôs peer relationships.

Mentee #05 (female) stated that she ñgets to know her friends better and talk with them more.ò Her mentor, M_#05, also stated that after getting closer with her mentee, she felt that she (mentee) opened up more. Mentee #05 further said that because she got to know her friends better, she talked with them more, as a result, she felt happier.

Mentee #11 (female) said, ñI feel happier. I start reaching out and play with my friends. Before, I seldom talked with people. I just played with my phone, surfed the internet or slept. I think 90% of my change is related to knowing my mentorò Yet, her mentor, M_#11, expressed that Mentee #11 had always been amendable, so she could not tell whether or not her (mentee) peer relationships had improved.

Improvement in Peer Relationships: Lower Levels of Conflicts. Mentees also indicated that they learned how to handle conflicts effectively from their mentors. Eight out of twenty-two mentees indicated that they had experienced lower levels of conflicts with their peers. Interestingly, all mentees who experienced such changes were female respondents. However, changes in peer relationships owing to lower levels of conflict did not seem to be associated with improvements in positive affect. Examples of codes identified were ñnot saying things to hurt othersò, ñto think more before I actò and ñless tantrumsò.

Mentee #03 (female) said, ñI try not to say things that hurt others, I feel I am more friendly now.ò Mentee #13 (female) said, ñMy relationships with my classmates are getting better now.ò Yet, her mentor, M_#13, said that she did not observe a big difference in her mentee as she (mentee) ñalways has a lot of friends, and she (mentee) is always happy.ò

Mentee #16 (female) stated, ñNow, I will think before I speak, at least, I do not do imprudent things nowé . I need to think from other peopleôs perspectiveé think about what is appropriate to say before I speak.ò Her mentor, M_#16, also told her mentee to ñthink carefully before she speaks.ò

4.3.2.3 Social Resources embedded in Mentoring relationship

The categories of direct advice, role modeling and companionship were identified as social resources embedded in mentoring in the interviews. The following describe each of these social resources.

Resources Embedded in Mentor-Mentee Relationships: Direct Advice. One of the most consistent and strongest categories identified in the interviews was the theme of having direct advice as a kind of social resources. Sixteen out of nineteen mentees

expressed that they had received direct advice from their mentors. The common codes used to identify this category were ñtalkò and ñteachò.

Mentee #04 (male) said, ñTony (mentor) told me that I could not keep suppressing myself and then let all my emotions out when I was triggered. It would not work in the long runò. His mentor, M_ #04, also expressed how he directly taught Mentee # 04 to control his emotions, ñThere came this time when he was arrested for fighting with a stranger on the street. I was the one who bailed him. When I saw him, I scolded him. I told him if he kept being like this, the problem would be more seriousò. His mentor also said that Mentee # 04 was receptive to his advice, ñOf course, he is rather receptive when he is with me, he never gets angry when I scold himò.

Resources Embedded in Mentor-Mentee Relationships: Encouragement. Another theme that emerged from the interviews was the social resource of encouragement. Ten out of the twenty-two mentees indicated having received encouragement from their mentors. The theme of encouragement was identified when mentees repeatedly showed that their mentors told them to ñtryò and ñnot to be afraid of failureò. Mentee #09 (female) recalled, ñI feel more confident and determined. Sometimes, I defer my decisions because of minor issues, now I will try even thought it would be a failure.ò

Resources Embedded in Mentor-Mentee Relationships: Role Modeling. Another strong theme emerging from the interviews was the role modeling function that mentors served. Some of common codes identified were ñto learnò, ñto seeò and ñto observeò. Eight out of twenty-two mentees indicated that they saw their mentors as role models. For the mentors, most of them did not indicate that they tried to be role model for their mentees, except for Mentor M_#08. Mentor, M_#08, said that he deliberately tried to be the role model for

his mentees, because he believed in observation learning, he said, ñIt is very simple. I am the role model. Students are the shadows of their teachers. This is why I insist on behaving myself in order to set a good role model. I show him (mentee) what it means by treating life seriously.ò

Resources Embedded in Mentor-Mentee Relationships: Companionship. The theme of having mentors as the sources of emotional support was also prominent across the interviews. Fourteen out of nineteen mentees indicated that their mentors served the purpose of being companions. All mentees who expressed receiving the social support of companionship show an improvement in their positive affect. The common codes used to identify this category were ñsharingò, ñbeing with meò, ñcares for meò and ñdo activities togetherò. Mentee # 04 recalled, ñMy mentor would like to do activities with meé .I ask my mentor to go play soccer with me or go boxing. He also asked me to play basketball with him, or we have dinner together.ò

4.3.2.4 Associations between Psychological and Social Outcomes and Social Resources Embedded in Mentoring relationship

Six prominent themes emerged in the qualitative information describing how social resources embedded in mentoring brought changes to the psychological and social outcomes of the mentees in the program. The social resources of direct advice were found to be associated with improvement in positive affect, family relationships and peer-relationships. Role modeling was associated with enhanced levels of motivation. Companionship gave positive improvement.

Theme 1: Direct Advice Leads to Improvement in Positive Affect. Mentee #08 (male) had experienced improved positive affect through receiving direct advice. Mentee #08 said, ñI am more rational now. Before, I easily felt very depressed because of minor issues. I am more optimistic now. I learn a lot from Peter (Mentor). He teaches me that

everything has its own course, and failure is something normal. I used to only focus on the results, and I got easily frustrated. I used to feel that everyone was against me. Now, I learn to look at things from other peopleôs perspectives and I have better temper nowé . When I asked him (mentor) something, he would tell me what to do. I want Peter (Mentor) to give me advice on how I should prepare myself for the future. He can help me.ò

Mentee #03 (female) expressed feeling ñnot being trappedò by her negative emotions after listening to her mentorôs advice. ñI was not happy about my part time job. Then, I called my mentor, and then she talked about it with me, told me not to worry too much and said that I was thinking too much. Then, she shared her experiences with me, and eventually, the problem was resolvedé .. I learned not to be trapped by my problems.ò Mentor, M#03, recalled teaching her mentee how to deal with conflicts at the work place, ñI share my experience with her (mentee). I tell her, sometimes, when you feel that other people are not talking to you in a respectful way or discriminating you, have you thought about ñwhy?ò. Why do other people treat you like this? I ask her to reflect on herself and ask her to put herself in other peopleôs shoes. And I tell her not to lose her temper immediately in the situation she is not happy with.ò

Theme 2: Direct Advice Leads to Improvement in Family Relationships. A prominent example was Mentee #04 (male). Mentee #04 (male) had been suffering from serious emotional and behavioral issues prior to joining the program. Living in a single parent family, Mentee # 04 lacked a father figure to identify with. He also stated that he had a rough and chaotic familial relationship, and complained that his mother ñnever tidy the houseò. After joining the program, Mentee # 04 showed significant improvement in his emotions and relationships with his mother. Mentee #04 recalled, ñTony (Mentor) taught me to control my emotions when I feel angry with my mother. When being scolded by her, if she is

right, I need to accept it. If she is wrong, then, I need to tell her that she is wrong about me. Tony plays the role of a mediator between my mother and me. He tells me about his family. Likeé when they fight with each other, how he would handle it. He tells me that I will only feel more distant from my family if I suppress my feelings. Gradually, I start to change my attitude. Now, I feel calmer when interacting with my mother.ò

Mentee #01 (female) expressed that her mentor helped her improve her family relationships by giving her direct advice. She said, ñJennifer (Mentor) asks me to reflect on how my family treats me. Then, I feel that my family is not that bad after all. Gradually, I feel more close to my family and I feel happier now. She (mentor) also reminds me that I should talk more with my family and should not think too much. My family relationships have turned better now, we talk a lot more. I thought about how to improve my relationships with my family before, but I never took action. I opened up after Jennifer told me to try. I am quite happy now.ò

Theme 3: Direct Advice Leads to Improvement in Peer Relationships. Mentee #03 (female) had lower levels of conflicts with her peers because her mentor often told her ñnot to be too straight-forwardò and to ñconsider other peopleôs feelings before expressing own ideasò.

In addition, Mentee#08 (male) had got improvement in peer relationships. ñAfter knowing my mentor (Peter), my social circle gets larger, and I start taking the initiative to talk with others. Before, I feel that I should let others talk to me first. Peter tells me that I should be more active and should not be afraid of giving more.ò The mentor, M_#08, also expressed in the interview about how he taught his mentee to be more considerate. He said, ñI tell him that you might be busy when I call you, I am busy as well, but I spare my time for you, so I hope that you will call me back when you are free. I do not believe in scolding, I believe in advising.ò

Theme 4: Encouragement Leads to Improvement in Self-Confidence. Encouragement was found to be associated with the menteesô increase level of self-confidence. Mentee #10 (male) expressed that his mentor helped him feel more confident in learning English. He said, ñMy mentor gives me confidence to learn English. He teaches me that I should let go. It is OK for one to fail. I need to treat it like a game. é He always sends me English newspaper, English songs or communicate with me in English in the emails sent to me.ò

Mentee #01(female) said that her mentor has uplifted her self-confidence. Her mentor encouraged her to implement a study plan, which resulted in better educational outcomes and her self-concept. Mentee #01 said, ñMy mentor encourages me to implement a study plan, she analyzes my problems of studying for me and tells me to go the library to try to studyé and I follow. My grades are much better in this semester, and I feel a sense of achievements.ò

Mentee #09 (female) also recalled how direct advice improved her self-confidence. ñI once asked my mentor whether or not I should apply for a school prefect at school. My mentor told me that I needed to try. Yes, if I never try, I would never know if I can do it or not.. I feel that I am less scared of failure now.ò Her mentor, M_#09, also expressed that she taught her mentee that ñtrying was important in lifeò and she should ñtake riskò and ñnot to be scared of failureò.

Theme 5: Role Modeling Increases Motivation. For enhancement in motivations, Mentee # 08 (male) expressed, ñI learn from my mentor that é you need to try, try really hard before you can succeed. My mentor has earned his success through working hard, and now, I know what I should do to get what I want.ò

Mentee # 09 (female) also had similar experience, ñMy mentor is really good at studyé and because she is really good at ité she can choose her own pathways or things that she likes to

do. Seeing her success, I feel that umé I should also try harder, so that I will have more choices in life and can do something that I like.ò

Mentee #11 (female) also indicated, ñBefore I knew my mentor, I thought it was so difficult to get into college, I might as well give up. I should just stay at school until I get my high school diploma and then a job. And then, my mentor tells me about her life at the university, it sounds great, she also shows me her office at the university, it sounds so attractive. I really want to get into university now. I want to tell my mentor that I can also do it.ò

Mentee #13 (female) said her mentor motivated her with her successful college life. ñMy mentor is a college student, and we visited her university together. After visiting her college, I really want to enter it too. I ask her a lot of questions on how to get into the college. I have a much clearer goal now.ò

Theme 6: Companionship Leads to Improvement in Positive Affect. Mentee #04 (male) expressed feeling happy because his mentorôs advice and help was always at hand. He said, ñI do not hide myself and feelings now. When something happens, I talk with my mentor. Before, I always suppressed my feelings. After I have shared my problems with my mentor, I feel that I have changed. I did not feel like throwing tantrums now. We talk about little things in life. I feel that I am better to control my emotions. I have more friends, and I feel happier.ò His mentor, M_#04, also expressed that he wanted to build up a close mentoring relationship with his mentee. He said, ñI want to have fun with my mentee. This is why we went to movies togetheré and I invite him to my apartment. He also calls me occasionally and asks me when I will be free.ò

Mentee #05 (female) indicated that she found comfort from being with her mentor. She felt happier and had a better control of her emotions ñWhen she knew that my mother was sick,

she visited my place, cooked dinner with me, made soup for my mother, it felt really good. She feels like one of my close relatives é é I feel happier after knowing my mentor. I feel I have a better control of my emotions. Before, I always contained by a sudden surge of anger, and I did not know why. Now, it is getting better. Because I share my problems with my mentor, I feel that I have changed now; I do not want to throw tantrums now. I get to know my friends better, and I talked with them more. Better emotions, more friends, happier.ò Her mentor, M_#05, also expressed that although it was difficult to establish a relationships with Mentee #05 in the beginning, the mentee slowly opened up. ñIt was difficult to establish a relationship with my mentee in the beginning, she was very quiet. When her mother was admitted to hospital, she called me and told me about it.ò The fact that the mentee decided to seek help from her mentor during times of difficulty showed that mentoring provided the mentee with the emotional support she needed.

4.3.2.5. Characteristics of High Quality Mentoring relationship

This category emerged as an unexpected one when I was analyzing the qualitative interviews and was out of the scope of the original plan of this dissertation. Such information is valuable because it told us the characteristics of high quality mentoring relationship. Among the twenty-two mentees interviewed, twenty expressed that they were satisfied with their mentoring relationship and two indicated that the relationships were poor. The characteristics of high quality mentoring relationship identified from interviews of mentees who indicated having a good relationship with their mentors were: Mentors playing an ñAdult-Friendò role (i.e., being an adult advisor and friend at the same time), mutual trust, and feeling to be important. On the other hand, most mentees indicated that they did not want to initiate contacts with their mentors

because they thought their mentors were busy. I described such perceived low availability of mentors as barriers to high quality mentoring relationship.

Characteristics of High Quality Mentoring relationship: Adult Friend Role of Mentors. Information from the interviews showed that mentors who played the role of an adult advisor as well as a friend for their mentees tended to have high quality mentoring relationship. Eleven out of twenty mentees who were happy with their mentoring relationship expressed that their mentors were no less than a ñparentò, ñbig brother or sisterò or ñteacherò who ñgives them adviceò, at the same time ñexchangesò or ñsharesò their personal feelings with them.

Mentee_#04 (male) stated that he shared a father-son relationship with his mentor. He said, ñI feel like having a fatheré . I was not treated well by any older male friends before, Tony (Mentor) is the person who treats me well.ò At the same time, his mentor also ñshares his personal experiencesò with him and did fun activities with him.

Some mentors played the big sister, big brother or teacher role. When asked about how Mentee #11 (female) feel towards her mentor, she said, ñShe (mentor) feels like a teacher, sometimes, she felt like a big sister. Sometimes, she would give me advice about life, and sometimes, she would do fun things with me.ò Similarly, Mentee #14 (male) said, ñMy mentor is my friend, sometimes, he feels like a teacher, who teaches me new things.ò

Feeling respected by their mentors makes the mentees felt that their mentors were their friends. Mentee #23 (female) expressed, ñFor instance, something happened one day, and I did not know what to do, so I asked my mentor. She then analyzed the situation for me and told me the pros and cons. Yet, she emphasized that I should be the one to make the final decision.ò Mentee #15 (female) said, ñMy mentor teaches me everything. She is willing to tell me her

personal story, which makes us closer and closer.ò In contrast, Mentee #16 (female), who indicated having a poor relationship with her mentor said, ñI feel that she is lecturing me, not what a friend would do. She looks serious, and whatever I do, I feel that she tends to disapprove.ò

Characteristics of High Quality Mentoring relationship: Trust. Another element that contributed to high quality mentoring relationship was trust. Six out of the twenty satisfying mentoring relationship were built on trust. The mentor of Mentee #04 (male) described how he established a close relationship with his mentee through trust. He said, ñWhen I learn that he has got into trouble, I immediately go to bail him out of the police station.ò The fact that the mentee preferred to contact his mentor rather than others and asked for help showed that he trusted his mentor.

Mentee #02 (male) indicated, ñWhen I am in trouble, he (mentor) really helps me. I really know, and I feel that he were my father. When I encountered a problem, he would resolve it for me. No matter what, he would never say that I make trouble for him. Even when he is feeling very tired, he would still be here when I need himé whenever I am upset, he gets the same feelings..ò

Mentee #01 (female) said, ñAfter I get to know her (my mentor), I start to trust her, and I feel very comfortable when sharing my problem with her.ò According to the mentor of Mentee#03 (female), it was trust that pulled the mentor and mentee together. ñShe (Mentee) feels that I am special because she (mentee) feels safe when she tells her stories to me. I feel that she (mentee) shows positive changes in her emotional status because she is willing to talk to me, and she will not hide herself up.ò

Characteristics of High Quality Mentoring relationship: Felt importance. **"**Feeling importantò in the eyes of the mentor, which was another factor that

contributed to high quality mentoring relationship. Five of the mentees said that they felt their mentors placed much importance on them. Mentee#02 (male) said, ñI feel happy that he (mentor) remembers me, at least he is willing to spend time on me é and he is willing to talk to me, it means that he always put me in her mind..ò Mentee #10 (male) said, ñMy mentor is busy and does not have much free time, yet, he is willing to spend his free time on meò. Mentee #16 (male) also indicated, ñMy mentor would spend his time on me instead on his family when he is on holiday I feel itôs OK.ò Mentee #23 (female) expressed, ñShe (Mentor) volunteers to help me so much in my life and teaches me a lot. She need not do it in this way. Yet, she chooses to be my mentor and does all this stuff.ò

Barriers to High Quality Mentoring relationship: Perceived Low Availability of Mentors. Six out of twenty-two mentees expressed that they did not initiate contacts with their mentors because they felt that their mentors were ñbusyò. Mentee #06 (female) who indicated having a poor relationships with her mentor said, ñI wish that my relationships with my mentor were closer, she did take me out. But, I always feel that she is too busy to do anything for me.ò Among those who share satisfying relationships with their mentors, some say that it would be better if their mentors were less busy. Mentee #12 (male) said, ñBut my mentor is so busy, if he is less busy, our relationships will be even better.ò Mentee #18 (female) expressed, ñI am afraid that I am bothering my mentor, because she is in her final year (college), she needs to study.ò

4.3.2.6. Conceptual Framework

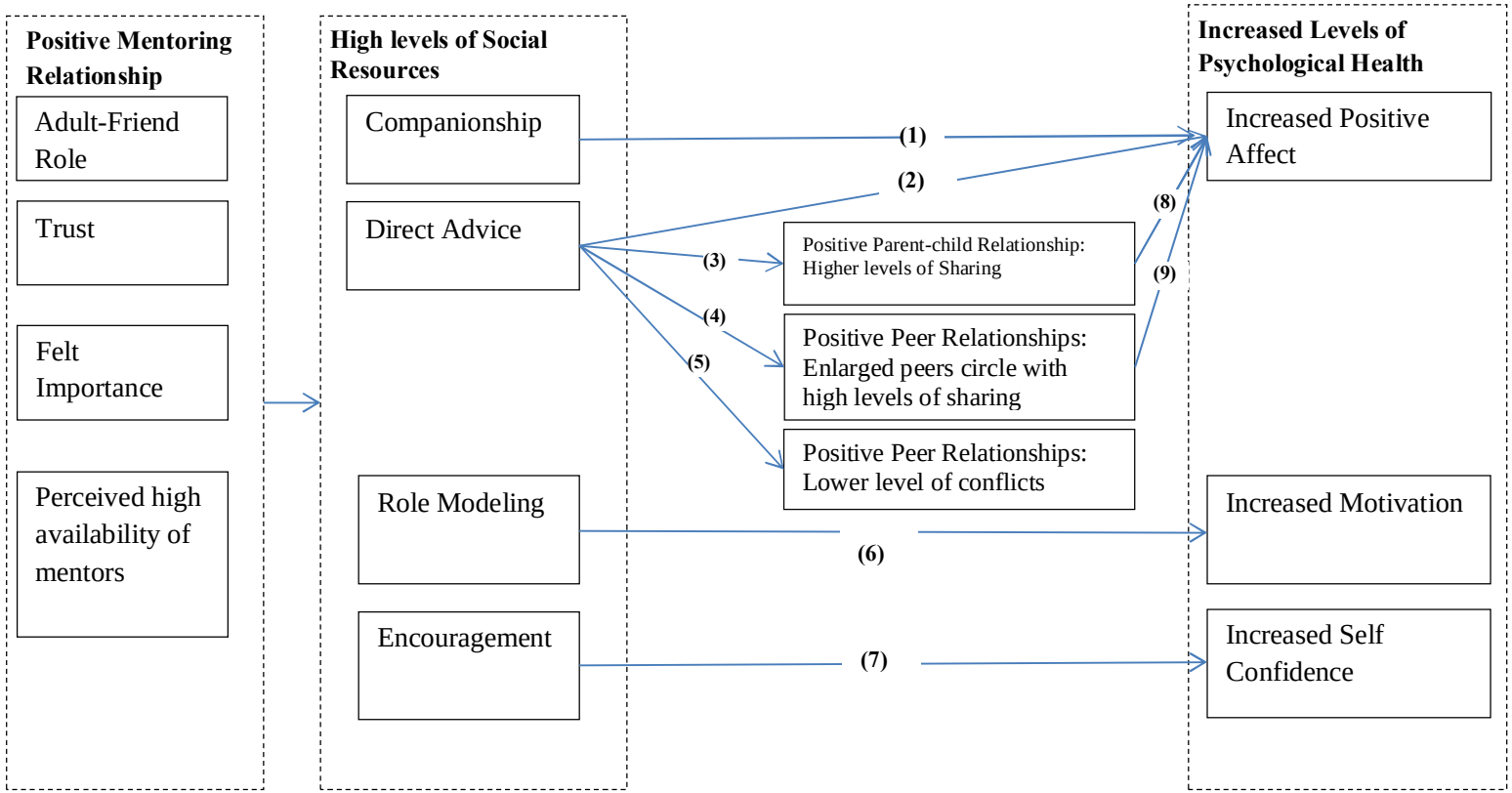
Figure 4.10 is a framework connecting the board categories identified in Section 4.3.2.1 to 4.3.2.5. For the direct effect of mentoring relationship, the following are the effects identified:

- **Companionship** improves the **positive affect** of mentees **(1)**
- **Direct advice** enhances **positive affect (2)**
- **Direct advice** gives better **family (3)** and **peers relationships (4 &5)**
- **Role modeling** uplifts **motivation (6)**
- **Encouragement** enhances **self-confidence (7)**

For the indirect effect of mentoring, positive social resources in mentoring improve the family and peer relationships of mentees, which then enhances their positive affect:

- **Direct advice** improves the **family relationships** of the mentees, which in turn enhances their **positive affect (8)**
- **Direct advice** improves the **peer relationships** of the mentees, which in turn enhances their **positive affect (9)**

Figure 4. 9 Conceptual Framework Based on the Qualitative Findings



4.3.3. Merging the Quantitative and Qualitative data

Two techniques were used to merge the quantitative and qualitative data in this dissertation: Data transformation and Data comparison (Creswell & Plano Clark, 2007). The following first presents the merged results using the technique of data transformation, followed by results using the technique of data comparison.

4.3.3.1 Data Transformation

To compare the quantitative and qualitative data, I transformed the qualitative data into quantitative data. Each participant was given a score of 1 if a category was identified in the interviews and 0 if the category was not present (Creswell & Plano Clark, 2007) (Table 4.9). Please refer to Chapter 3, Section 3.6.3 for data analysis plan. The transformed qualitative information was compared with results of the quantitative analysis (Figure 4.9).

Similar Quantitative and Qualitative Findings. Comparing the qualitative information to results of the quantitative analysis, both quantitative and qualitative information provide some similar insight, which were the associations between mentoring relationship and psychological health, parent-child relationship and psychological health and mentoring relationship and parent-child relationship. Such converged results also implied the mediating role of parent-child relationship on the effect of mentoring relationship on psychological health.

For the associations between psychological health and mentoring relationship, qualitative interviews showed that seventeen out of nineteen of the mentees who indicate experiencing positive changes in their psychological health also experienced positive mentoring relationship. Results of the quantitative data using analyses also showed similar direction: Mentoring relationship was positively associated with psychological health.

For the associations between mentoring relationship and parent-child relationship, although only four mentees indicated having experienced positive changes in their parent-child relationship, all four of them expressed that they had good relationships with their mentors. Results of the quantitative data also showed that mentoring was associated with positive parent-child relationship.

For the associations between psychological health and parent-child relationship, all mentees who indicated experiencing positive changes in their parent-child relationship also showed improved positive affect. Findings suggested that parent-child relationship and psychological health are related. Results of the quantitative data also showed that parent-child relationship was associated with positive psychological health.

Dissimilar Quantitative and Qualitative Findings. Contrarily to the quantitative results, which showed that peer network size was not associated with psychological health and mentoring quality, qualitative data showed the otherwise. The quantitative and qualitative results also diverged in the aspects of family network. While quantitative results showed that family network was associated with psychological health, qualitative findings failed to reveal such information.

According to the interview information, fourteen out of nineteen of the mentees who indicated having positive peer relationships also experienced positive changes in their psychological health. For the associations between peer relationships and mentoring relationship, fourteen out of nineteen of the mentees who indicate having positive peer relationships also have better mentoring relationship. Yet, quantitative results suggested that peer network size was not associated with psychological health and mentoring relationship.

Table 4. 8. Summary of Qualitative Information in Quantitative Format

id	Age	Gender	Positive Affect	Motivation	Self Confid-ence	Positive parent-child Relationship	Positive Peer: Larger Social Circle	Positive Peer : Less Conflict	Companion-ship	Direct Advice	Role Modeling	Encourage -ment
1	16	Female	1	1	1	1	1	1	1	1	0	1
2	17	Male	1	0	0	0	1	0	1	1	0	0
3	16	Female	1	0	0	0	1	1	1	1	0	0
4	15	Male	1	1	0	1	1	1	1	1	1	1
5	17	Female	1	0	0	0	1	1	1	0	0	0
6	14	Female	0	0	0	0	0	0	0	0	0	0
7	17	Female	1	0	0	1	0	0	0	0	0	0
8	17	Male	1	0	0	0	1	1	0	1	1	0
9	16	Female	1	1	1	0	0	0	1	1	1	1
10	18	Male	1	1	1	0	0	0	1	1	1	1
11	15	Female	1	1	1	0	1	0	1	1	1	1
12	17	Male	0	0	1	0	1	0	0	1	0	0
13	14	Female	1	1	0	0	0	1	1	1	1	1
14	14	Male	1	0	1	1	0	0	0	1	0	1
15	16	Male	1	1	0	0	1	0	0	0	1	0
16	17	Female	0	0	0	0	0	1	0	1	0	0
17	15	Female	1	0	0	1	0	0	0	1	0	0
18	14	Male	1	0	0	0	0	0	1	0	0	0
19	18	Female	1	0	0	0	1	0	1	0	0	1
20	16	Male	1	1	0	1	0	1	1	1	1	0
21	15	Female	1	0	1	0	1	0	1	1	0	1
22	15	Female	1	0	0	0	1	0	1	1	1	1

4.3.3.2 Data Comparison

Apart from using the technique of data transformation, I also directly compared the qualitative information with the quantitative findings. I first compared the different constructs of psychological health identified in the quantitative data set and the qualitative interviews. The constructs of depressive symptoms and self-efficacy were measured in the quantitative study, and the psychological constructs of positive affect, motivation and self-confidence were identified in the qualitative strand. Decreased depressive measured in the quantitative data and increased positive affect identified in the qualitative information could be interpreted as the same construct because a decrease in depressed moods tended to be associated with increased positive emotions. Similarly, the constructs of motivation, self-confidence and self-efficacy are theoretically related constructs (Bandura, 1997). According to the Self-Efficacy Theory, a person who believed that he had the ability to accomplish a task would be motivated to act on it. As for self-confidence, a person who believed that he was capable of success would also have a higher level of self-confidence.

Second, I compared the associations among the constructs in the quantitative and qualitative data. Both sets of findings supported that mentoring relationship enhances the psychological health of youth. In addition, parent-child relationship mediated the effect of mentoring on positive psychological health. Yet, while qualitative information showed that peer relationships mediated the effect of mentoring relationship on positive psychological health, while quantitative findings do not offer such evidence.

Last, the qualitative findings expanded the quantitative findings by describing in details the types of social resources in mentoring relationship that helped promote the positive psychological health of mentees. Direct advice was the most influential sources of social support,

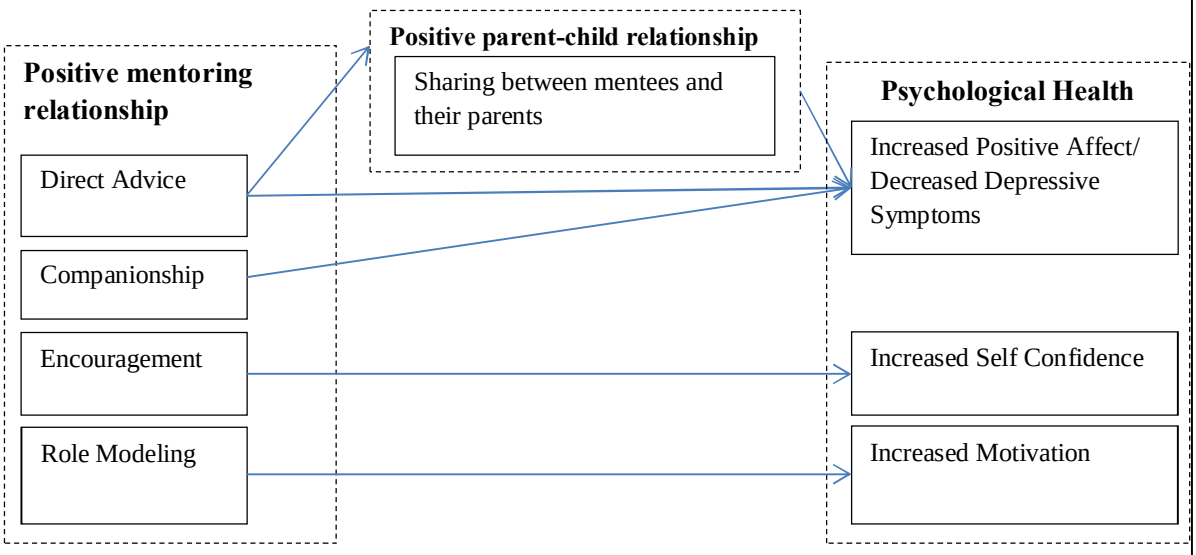
followed by companionship and role modeling. Results were interesting as it informed us on the particular type of social resources associated with specific psychological outcomes. Moreover, qualitative information also told us the characteristics of high quality mentoring, which were having mentors playing the adult-friend role, making mentees feel important, being able to establish trust and being perceived as being available.

4.3.4. Merged Framework

Figure 4.10 combines findings of the quantitative and qualitative study. Mentoring relationship was positively associated with the psychological health of the mentees. The social resources of direct advice, companionship, encouragement and role modeling were identified in positive mentoring relationship, and such social resources were associated with positive outcomes. Mentoring also improves parent-child relationship, which enhances positive psychological health through the social resources of high levels of sharing between the mentees and their parents.

I specified the pathways of these social capitals to different types of positive psychological health. In figure 4.10, the positive affect of mentees was associated with the social resources of direct advice and companionship, as well as the high levels of sharing between the mentees and their parents. In addition, direct advice provided by mentor was associated with high levels of parent-child sharing. For self-confidence, encouragement helped mentees develop a positive sense of self. Last, role modeling was related to high levels of motivations in the mentees.

Figure 4. 10.**The Merged Framework**



Chapter 5. Discussion

This dissertation explores mentoring as a social capital intervention to promote the psychological well-being of these adolescents. Both quantitative and qualitative findings show that mentoring relationship are positively associated with youthsôpositive psychological health, which fulfills the basic definition of social capital of facilitating positive outcomes as proposed by Coleman (1988). The social resources identified in strong mentoring relationship can be regarded as bridging social capital, which are resources accessed through ñconnections that cross classò (Kawachi, Subramanian & Kim, 2008). In addition, the social resources of direct advice provided by mentors are associated with the positive changes in the youthsôparent-child relationship, which in turn, is associated with their psychological health. Again, such social resources can be considered social capital as it is associated with positive psychological well-being (Coleman, 1988). The social resources of high levels of sharing found in positive parent-child relationship can be considered bonding social capital it is resources accessed through people of similar characteristics (Kawachi, Subramanian & Kim, 2008). These results provide preliminary evidence that mentoring can be an intervention that creates social capital.

Yet, this dissertation does not capture one aspect of social capital as defined by Lin (2001), which is the menteesôuse of the resource embedded in mentoring relationship to improve their psychological health. According to Lin (2001), social capital is ñresources embedded in a social structure which are accessed and/or mobilized in purposive actions.ò While this dissertation shows that the social resources embedded in mentoring relationship is associated with the outcomes of positive psychological health and close parent-child relationship, I do not measure how menteesôused or gain access to these social resources. As such, although findings provide preliminary information that mentoring can be a social capital intervention, further

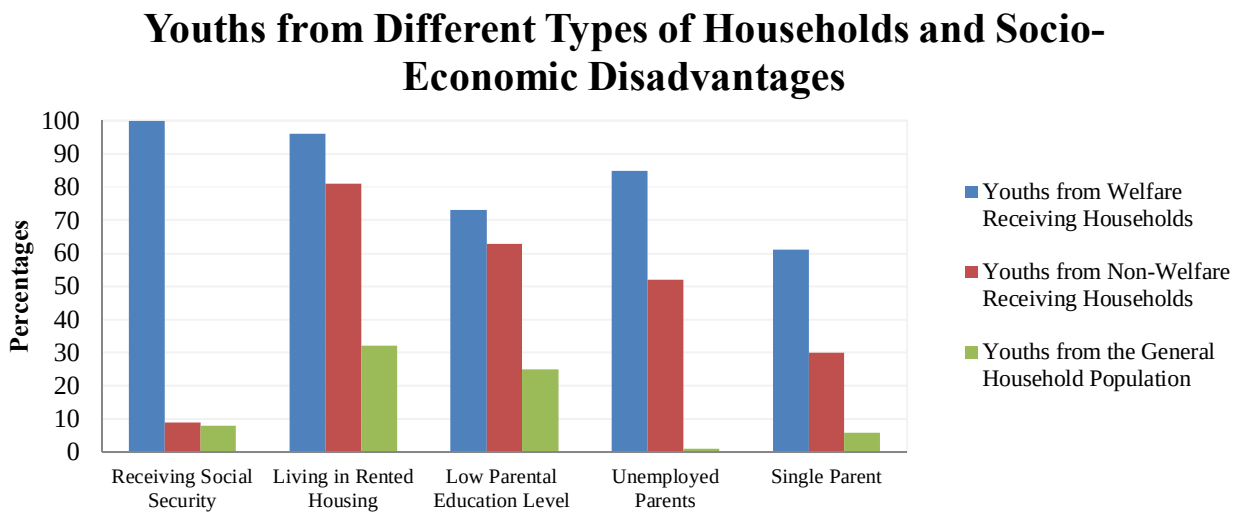
research is needed to offer more solid evidence to support the claim. The following first discusses findings according to each specific aim. The strengths and limitations of this study are then presented, followed by a discussion of the implications of this dissertation research.

5.1. Aim 1. Operationalize Childhood Poverty

. The purpose of this first aim is to operationalize childhood poverty in the social context of Hong Kong. Results of this aim expand the official definition of childhood poverty by showing that childhood poverty can be represented by the socio-economic indicators of receiving social-security, living in rented housing, having parents with low levels of education, having unemployed parents, and living in single parent family. Based on the findings, I classified youths participating in the Child Development Fund Program into two groups, ñLiving in welfare receiving householdsò versus ñLiving in non-welfare receiving householdsò.

To understand the results in the larger social context of Hong Kong, I further compare my findings with the statistics on the community sample obtained from the Hong Kong Poverty Situation Report 2012 (Census and Statistics Department [HKSAR], 2013).

Figure 5. 1 Youths from Different Types of Households and Socio-Economic Disadvantages



In general, the ñliving in welfare receiving householdsò group has the highest percentage of youths experiencing various types of familial socio-economic disadvantages, followed by the non-welfare receiving group and the community sample. Such a result support the use of the indicators of receiving social security, living in rented housing, having low parental education, having unemployed parents, and living in single parent family to represent childhood poverty in Hong Kong.

Horizontal comparison examining the percentages of youths suffering from different socio-economic disadvantages shows that the indicator of ñliving in rented housingò has the highest percentage comparing to other indicators. Such findings can be explained by the sky rocketing property prices in Hong Kong (Global Property Guide, 2009; The Economist, 2011). The rising property prices make housing basically unaffordable even for the middle class, as such, most people have no choice but to live in rented housing.

Vertical comparison shows that as the youths move from living in welfare receiving households to non-welfare receiving, poverty is more represented by socially-related indicators. Apart from family welfare status, parental unemployment status is the second most representative indicators of poverty for the welfare receiving class according to the graph. While 80% of the welfare receiving group has unemployed parents, the percentage drop to about 50 % for the non-welfare receiving group, and close to 0% for the community sample. The high representativeness of parental unemployment status in the welfare receiving class implies that being employed is closely tied with household income in Hong Kong.

Comparing with the welfare receiving group, the indicators of living in single parent family and low parental education are more representative in the non-welfare receiving group. Low parental education level is the second most representative indicator for the non-welfare

receivers, while it is the second last for the welfare receivers. For single parent family, it is the weakest indicator for the welfare receiving group; while it is the second last for the non-welfare receivers. Such findings imply that once the household income of the youths pass a threshold, the social status of the family matters more. While the monetary indicator of family welfare status is still most useful in identifying the poorest youth population in Hong Kong, the use of other social indicators are necessary if we want to identify disadvantaged youths living in less poor households.

Results provide us with a direction to understand the meaning of childhood poverty for youths in less poor households: instead of facing financial difficulty, deprivations of the social resources of a stress-free familial environment, desirable familial relationships and high levels of parental ability (i.e., in terms of their education level) matter more to them. With reference to the capability approach to childhood poverty (Sen, 1999), the deprivation of familial resources take away the opportunity for youths to develop to their full potentials. Although youths who live in non-welfare receiving household have relatively more material resources than young people from welfare receiving families, they lack the appropriate environments to help them transform the tangible resources into achievements. As such, non-monetary interventions for disadvantaged youths from less poor households can focus on improving their family environments in order to provide these young people with the necessary platform to maximize their potentials.

5.2. Aim 2 . Examine the Psychological Consequences of Childhood Poverty

Findings of this aim show that youths living in poverty in Hong Kong are in need of attention. Results emphasize the negative consequence of childhood poverty on the young peopleôs psychological health. First, although the negative effect of time is small, with only a reduction in 0.3 point of psychological health for every two months, it still shows that the

psychological health of the youths drop over time. Second, and more importantly, it is the parental subjective perception of poverty, but not the event of poverty itself, that is associated with the poor psychological status of their children. Apart from these key findings, gender and age are also found to be significantly associated with psychological health.

Negative Effect of Time. The negative development in psychological status found in this part of the study is consistent with the existing literature. Studies suggest that the youth growing up in poverty have poorer mental health when they reach adulthoods (Buchanan, Brinke & Flouri, 2000; Brooks-Gunn & Duncan, 1997). Such results imply that the knowledge generated in the U.S. can be applied in the social settings of Hong Kong.

The longitudinal findings also add value to the current childhood poverty literatures of Hong Kong. Existing studies documenting the psychological health of the poor youths in this city are cross-sectional or descriptive in nature. This study offers empirical evidence that the negative psychological consequences of childhood poverty are not transient but enduring.

We can also understand the results within the unique social context of Hong Kong. The sky rocketing property prices of Hong Kong force many poor families to reside in crowded suites or rooms. Many young people from low-income families live in crowded housing. As well documented, crowded living environments create stress, which hurts psychological health (Kiser, 2007; Shek & Leung, 2011). Therefore, the psychological health of the participants is expected to decrease over time.

However, a closer look at the standardized beta of time, which is commonly used as a measure of effect size in regression analysis (Nieminen, Lentiniemi, Vahakangas, Huusko & Rautio, 2013), suggests that even though time is a statistically significant independent variable, the practice significance is considered small (B=0.1). According to Cohen (1988), a coefficient

of 0.1 is considered weak in association. Considering that youths were participating in the Child Development Fund Program at the time of the study, the intervention might have a buffering effect on the participants, causing them to experience a relatively steady psychological health development over time.

Negative Effect of Parental Perceived Economic Pressure. The significant negative effect of perceived parental economic pressure on psychological health also provides us with information to understand how childhood poverty affects youthsôwell-being. The negative psychological development may be explained by the sense of inferiority experienced by the impoverished parents. Hong Kong, as an economically advanced city, does not encounter the issue of absolute and chronic poverty. Rather, it is the relative deprivation of poverty that hurts people. The poor may feel inferior when they compare themselves with their more well-off counterparts, causing them to feel dissatisfied about their lives (Diener, 1984; Schimmel, 2013). This sense of inferiority may harm the mental health of the parents, causing them to amplify the negative impact of financial difficulty. Parentsônegative perceptions of poverty may lead to their poor mental health, which cause undesirable parent-child relationship and poor psychological health in their children (Leung & Shek, 2011; Conger & Elder, 1994). Yet, similar to the effect size of time, the standardized beta of this variable was also 0.10, which was considered small according to Cohen (1989).

Furthermore, the negative effect of perceived parental economic pressure expands our understanding on the notion of intergenerational transmission of psychological well-being. Current results show that the undesirable psychological health of parents in low-income families also transmits to their children. After all, it is the mental health of the parents that affect the psychological well-being of their children.

Effect of Childhood Poverty and Having Experienced Financial Difficulty. The non-statistically significant effect of childhood poverty and having experienced financial difficult show that the event of poverty was not associated with unhappiness. With the right environment, youths living in poverty can also develop resilience against poverty (Felner & DeVries, 2013). In addition, such findings echo with the capability approach to understanding childhood poverty: The deprivation of resources itself may not be a reliable indicator of childhood poverty. It is how resources are utilized that determines poverty.

Effect of Gender and Age. Results also show that female participants have consistently lower psychological health than male youths over time. This finding is consistent with existing literatures, which demonstrate that females tend to display higher levels of internalizing problems, such as depression and low sense of self, whereas males tend to manifest higher levels of externalizing behavioral issues (Leadbeater, Kupermic, Sidney & Hertzog, 1999; Eaton, Krueger, Keyes & Hasin, 2011). The results do not denote that female adolescents are more psychologically vulnerable than male young people. Considering the study does not evaluate the behavioral outcomes of youths living in poverty, male participants may display higher levels of problematic behaviors than female participants. Additional research can further examine this area to draw a more comprehensive conclusion on the psychological well-being of male and female youths living in poverty in Hong Kong.

Last, young people who are older at the start of the study also have poorer psychological health over the course of the research. The initial age of enrollment into the Child Development Fund Program ranged between 10 and 16 years old, which was a period that spanned from puberty to adolescence. As aforementioned, adolescence is characterized with stress due to biological, psychological and social changes (APA, 2002; Rosenberg, 1989), therefore, it makes

sense that older participants tend to have poorer of psychological status. Such findings imply that interventions targeting to promote the psychological health of youth in poverty should be implemented as early as possible in order to yield the largest positive effect.

5.3. Aim 3 . Explore How Mentoring Promotes the Psychological Health of Youths in Poverty

Findings of this mixed research study are most important to this dissertation. While results of the first two aims tell us about the childhood poverty situation in Hong Kong, findings of this third aim inform us on the solution to the undesirable circumstances. The four key findings of this aim are: (1) Positive social relationships take away the negative effect of time and parental perceived economic pressure on psychological health; (2) Mentoring is associated with positive psychological health in youths; (3) Parent-child relationship mediates the effect of mentoring on the psychological health of youth; and (4) Mentoring quality matters. Results provide us with valuable information to generate a step by step guide on the implementation of mentoring interventions in Hong Kong, namely, the goals of mentoring and selection of mentors. Although the results may seem generic, the use of the mixed methods research offers preliminary evidence on the implementation of mentoring interventions to maximize its effectiveness. A detail discussion on the best practices of mentoring is presented in the practice implication (Section 5.5.1). In the following, I first talk about the four key findings, then I discuss the convergent and divergent findings of the quantitative and qualitative study.

5.3.1. Key Findings

Findings of the quantitative part demonstrate the importance of social relationships on psychological health of youths living in poverty. When mentoring and parent-child relationship were included in the model, the negative effect of time and perceived parental economic pressure

on the psychological health of youths disappeared. Such findings are reminiscent of Emmy Wernerôs longitudinal study on children growing up in poverty in Hawaii, which demonstrates that youths who manage to find emotional support from parents, kins or significant adults develop high levels of resilience against adversity (Werner & Smith, 2001).

Quantitative results further show that mentoring relationship is associated with positive psychological health. Yet, the standardized beta of mentoring relationship, which is commonly used as a measure of effect size in regression analysis (Nieminen, Lentiniemi, Vahakangas, Huusko & Rautio, 2013), show that even though mentoring relationship is a statistically significant independent variable, the practice significance is considered small (B=0.09). However, this effect size was comparable to the effect of size of mentoring on psychological and emotional outcomes of mentees in existing mentoring research (DuBois et al., 2011). According to a meta-analysis conducted by DuBois et al (2011), the mean post-test effect size of mentoring programs on the psychological and emotional outcomes of youths based on 41 studies was 0.14. Because I was testing the effect of mentoring relationship rather than the effect of the mere existence of mentoring interventions, it makes sense that the effect size found in my dissertation is slightly smaller. Therefore, the magnitude of the effect of mentoring relationship on psychological health is comparable to the findings of existing mentoring research. Qualitative interviews also cross validate the quantitative findings, showing that mentoring is associated with the positive psychological health of positive affect, increased self-confidence and enhanced motivation level.

Quantitative results offer additional evidence that positive parent-child relationship mediates the effect of mentoring on psychological health. Qualitative information also provides us with preliminary information on the role of parent-child relationship in mentoring. Moreover,

it expands the quantitative findings by showing that mentoring improves parent-child relationship through the provision of direct advice. Other sources of resources identified are companionship, encouragement and role-modeling. This findings echo with Rhodesôresearch, which shows that mentoring enhances global self-worth through the indirect effect of improved parental relationships (Rhodes, Reddy and Grossman, 2005).

Last, on contrary to existing research, which only look at the sole of existence of mentoring as an ñall or noneò intervention, this study stresses the importance of mentoring quality (Rhodes, 2002). The positive effects of mentoring relationship on psychological health demonstrate that the quality of relationships between mentors and mentees is the key to successful mentoring. The interviews results also highlight the importance of relationship building in mentoring interventions by revealing the characteristics of high quality mentoring relationship. .

5.3.2. Convergent Findings

Both quantitative and qualitative results are similar in some aspects. These converged findings cross validates each other, providing evidence on the generalizability of the results and strengthens the conclusion of this research. Given that the two mentoring programs were carried out at different settings, with different orientations, and consisted of mentees with different demographics characteristics, the corroborated results increased the generalizability of the findings.

Both set of findings show that mentoring relationship positively affect the psychological health of youths living in poverty. In addition, parent-child relationship has a positive effect on the psychological health too. Furthermore, parent-child relationship mediates the positive effect

of mentoring relationship on psychological health. Last, mentoring is not an ñall or noneò intervention; mentoring quality matters.

Convergent Findings: Mentoring relationship and Psychological Health. Both quantitative and qualitative findings show that mentoring relationship positively affect the psychological health of youths living in poverty, which collides with results of existing mentoring literatures (Lee & Cramond, 1999; DuBois & Silverton, 2005; Rhodes, Reddy & Grossman, 2005; Whitney, Hendricker & Offut, 2011; Langout, Rhodes & Osborne, 2004; Karcher, 2005; Rhodes, Haight &Briggs, 1999; Bodin & Leifman, 2011; Herrera et.al, 2011; Whitney, Hendricker & Offut, 2011). More importantly, qualitative findings add value to the study by expanding the quantitative results: the social resources of direct advice, encouragement, role modeling and companionship provided by the mentors increase the positive psychological health of the mentees.

Direct advice provided by mentors is one of the most consistent categories found in the interviews. Such findings imply that mentoring intervention carries its cultural uniqueness in the Chinese setting of Hong Kong. Because of the entrenched values of respecting elders in Chinese society (Hammond & Glenn, 2004), the nature of mentor-mentee relationships in Hong Kong tend to resemble parent-child, teacher-student or elder -younger siblings interactions. Mentors, because of their rich life experiences, may feel that they are responsible for offering advice to their mentees. At the same time, mentees may expect their mentors to guide them, and rely heavily on their mentorsôadvice. Such an expectation makes direct advice an effective social resource that brings positive changes to the menteesôpsychological outcomes.

Furthermore, all mentees from the School Based Problem Solving Skills Mentoring Program are from low-income families, where their parents do not have the cognitive (e.g.,

useful advice), emotional (e.g, patience) and physical resources (e.g., time or social network) to invest in them (Leung & Shek, 2011). The absence of a parent in the lives of the mentees may cause them eager to have special adults who can provide them with the resources they need for positive development. As such, they may be more receptive to their mentorsô advice.

On contrary to theoretical assumptions, which suggest that the social resources of direct advice only increased the sense of self (Bandura, 1977), current findings show that direct advice can also improve the positive affect of the mentees. Good mentors may help their mentees to develop their capacity for emotional regulations (Rhodes, Spencer, Keller, Liang & Noam, 2006). Through the process of ñemotional coachingò, mentors teach their mentees to manage their feelings. Specific to Chinese culture which encourages ñacceptanceò (Chan, Chan & Ng, 2006), mentors in the interviews also tell their mentees to ñlet goò of and ñacceptò their negative feelings.

In addition to direct advice, companionship is another type of social resources in mentoring that contributes to the positive affect of mentees. According to the interviews, mentees, who have mentors who can spend time with them, listen to their problems and do fun activities with them, experienced improvements in their positive affect. The enjoyable interactions with the mentors improve the psychological well-being of the youths who typically experience difficult circumstances (Sarason & Sarason, 2001). In addition, having a special adult to rely on may provide the mentees with a sense of security, which improves their emotional regulation ability (Rhodes, Spencer, Keller, Liang & Noam, 2006). Another study on adolescents participating in a formal mentoring program also shows that companionship is a dominant theme in close mentoring relationship (Spencer, 2006).

Referring back to the interviews, the social resource of role-modeling is found to be associated with the psychological health of motivations in the mentees. Mentors, because of their successful experiences, offer a possible future for their mentees by opening doors to new opportunities (Rhodes, Spencer, Keller, Liang & Noam, 2006). The process goes along with the Self-Efficacy Theory proposed by Bandura (1977): Seeing the successful experiences of their mentors, mentees come to believe that they also have the ability to succeed, which motivate them to set goals and work towards them. Research evidence also shows that mentors are positively associated with adolescentsô expectations about the future (Hellenga, Aber & Rhodes, 2003). Other studies also demonstrate that mentoring is effective in driving up academic outcomes, including enhanced perceived school competence, as well as increased chances of high school completion and college admission (Gordon, et al., 2009; DuBois & Silverton, 2005; Herrera, et al., 2001; Rollin et al, 2003).

Last, the social resource of encouragement embedded in mentoring relationship is associated with increased level of self-confidence. The notion of encouragement is similar to the idea of direct advice. Encouragement can be considered a form of verbal persuasion (Bandura, 1977). While direct advices are instructions provided by the mentors, encouragements are words that lead the mentees to believe that they could succeed. Through telling the mentees that they will do well, mentors provide positive information for the adolescents to form opinions of themselves, which help them develop a positive self-image (Rhodes, Spencer, Keller, Liang & Noam, 2006). Intervention research investigating the positive effect of mentoring on adolescentsô sense of self also show that mentors can improve their global self-worth, self-esteem and self-efficacy (Lee & Cramond, 1999; DuBois & Silverton, 2005; Rhodes, Reddy & Grossman, 2005; Whitney, Hendricker & Offut, 2011; Langout, Rhodes & Osborne, 2004; Karcher, 2008; Rhodes,

Haight &Briggs, 1999; Bodin & Hakan, 2011; Herrera et.al, 2011). Furthermore, encouragement may have larger impact on the adolescent participants of this study than young people at other developmental stages, because adolescence is a stage characterized by search of self-identity (APA, 2000). Therefore, all external information telling the adolescents about themselves is more likely to affect their development of self than youths at other age stages.

Convergent Findings: Parent-child relationship and Psychological Health. Both quantitative and qualitative findings show that parent-child relationship promotes the positive psychological health of mentees. Quantitative findings show that close parent-child relationship and large family support network are associated with positive psychological status of the youth living in poverty. Qualitative information also tells us that good parent-child relationship, defined as high levels of sharing between parent and child, is associated with positive affect. Findings is reminiscent of the Stress Buffering Hypothesis (Cohen & Wills,1985) and Family Stress Model (Conger & Elder, 1994), which suggest that high levels of emotional closeness with parents enhance the positive moods and decrease the depressive symptoms of youths. Research evidence also shows that warm parent-adolescent relationships buffer the distress associated with poverty (Dashiff, DiMicco, Myers & Sheppard, 2009). Results emphasize the importance of positive parent-child relationship in the positive psychological health of youth.

Convergent Findings: Parent-child Relationship, Mentoring relationship and Psychological Health. The mediating role of parent-child relationship in the positive effect of mentoring relationship on psychological health is also proven by both qualitative and quantitative data. Literatures also show that mentoring enhances global self-worth through the indirect effect of improved parent-child relationship(Rhodes, Reddy and Grossman, 2005).

Previous studies also tell us that positive mentoring relationship improved adolescentsô perceptions of their parental relationships, such as levels of intimacy, communication and trust (Rhodes et al., 2000). The concurrent findings provide cross-validated evidence on the role of parent-child relationship in mentoring.

The qualitative study further expands this finding by identifying mentorsôdirect advice as the agent that promotes positive parent-child relationship. In the interviews, mentors gave direct instructions for mentees on how they should interact with their parents, which led to higher levels of parent-child sharing. Findings suggest that mentors serve as a middle-man between the mentee and their parents. As adults, mentors are able to understand the parentsôperspective. At the same time, the mentors are empathetic enough to understand the menteesôfrustration. Because of the good relationships that the mentors share with their mentees, the adolescents are receptive to the mentorsôadvice to adopt an effective way to communicate with their parents (Keller, 2005).

Convergent Findings: Mentoring Quality Matters for Participants who Completed the Program. Quantitative findings, which show that positive mentoring relationship drive up psychological health and parent-child relationship, suggest the importance of mentoring quality. Yet, because of the high level of systematic missingness in the data set, we can only make such a conclusion based on those who completed the program. Interview information also show that mentees who enjoy a good relationship with their mentors have positive psychological outcomes. In addition, qualitative results tell us the characteristics of high quality mentoring relationship Such findings, again, show that mentoring is not an ñall-or-none matterò. As suggested by Rhodes et al. (2006), relationships closeness with mentors is the

foundation to effective mentoring. After all, simply assigning mentors to youths will not help. It is the quality of mentoring that counts.

Information of the interviews shows that mentors who can balance their role as advisors and friends are able to cultivate positive mentor-mentee relationships. Mentees from low-income families need adult role models in their lives that could provide them with advice and encouragement unavailable to them from parent or family members (Rhodes, Spencer, Keller, Liang & Noam, 2006). At the same time, mentees also need special friends whom they can share their feelings or do fun activities with (Rhodes, Spencer, Keller, Liang & Noam, 2006). A study carried out by Pryce and Keller (2012) shows that the horizontal friendship roles together with the vertical teacher roles of mentors are associated with positive mentor-mentee relationships.

Trust and felt importance were also identified as important elements in mentoring relationship in the interview. The notion of trust and feeling important in the eyes of mentors are closely related. The element of trust allows the mentees to believe that they are special to their mentors. As a result, the mentees will perceive their mentors as someone whom they can rely on (Rhodes, 2002). Adolescents can only benefit from their mentors if they believe that their mentors can help them. Research evidence also tells us that trust reported by mentees is associated with their self-worth (Rhodes, Reddy, Roffman & Grossman, 2005).

Finally, menteesôperceived unavailability of mentors makes it an obstacle to cultivate good mentor-mentee relationships. Mentees need to feel that their mentors are available to them and trust that they are not bothering their mentors in order to establish good mentoring relationship. This idea is tied with the notion of feelings of closeness with the mentors (DuBois & Neville, 1997). Mentees who have close mentoring relationship will be more willing to initiate contact with their mentors (DuBois & Neville, 1997). On the other hand, if mentees feel that

their mentors are always busy, they will be reluctant to contact their mentors because they do not want to be perceived as burdens to the relationships (DuBois & Neville, 1997; Parra et al., 2002).

5.3.3. Divergent Findings

The quantitative and qualitative findings also diverge. The quantitative and qualitative findings are dissimilar in identifying the role of peer relationships in mentoring. In addition, the effect of family network on psychological health is demonstrated in the quantitative findings, but not the qualitative one. The dissimilar findings can be explained by the different orientations and settings of the mentoring programs and the characteristics of the participants.

Divergent Findings: Peer networks, Mentoring relationship and Psychological Health. The quantitative and qualitative findings diverge in identifying the role of peer relationships in the association between mentoring relationship and psychological health: While the quantitative results suggest that increased peer network size is not associated with positive psychological health, qualitative findings show that enlarged peers circle is associated with increased positive affect. The qualitative findings is supported by existing research evidence telling us that youths with stronger connections with mentors have a higher capacity to relate well to others (Rhodes, Grossman & Resch, 2000) and higher levels of perceived support from peers (Rhodes, Haight & Briggs, 1999).

The dissimilar quantitative and qualitative findings can be explained by the differences in the settings of Child Development Fund Program and the School Based Problem Solving Skills Mentoring Program. The Child Development Fund Program was organized via local non-profit organizations where mentees did not have much opportunity to interact with other participants. Yet, for the School-Based Problem Solving Skills Mentoring Program, a lot of the activities were organized at the school where the mentees were given many chances to interact with other

participants. In addition, the organizers encouraged the mentors to team up with each other to organize joint activities for their mentees. Such a program design provides opportunities for the mentees to enlarge their peer circles. Researchers in the mentoring field also suggest that school-based programs may have the advantage of enhancing school connectedness (Gorden, Downey & Bangert, 2013). School-based mentoring programs are more simple and thus, easier to monitor than community-based mentoring programs, which may lead to higher programs effectiveness (Wood & Mayo-Wilson, 2012).

Another reason can be explained by the dissimilar population composition of the youths in the quantitative and the qualitative strands. Most mentees in the quantitative part of the study are locally born youth, and most of those in the qualitative study are new arrivals from Mainland China. New arrival youths experience social discrimination (Chan, 2012). Most of them are also being teased at or bullied because of their immigrant status (Hung, 1998). These negative social experiences may cause the new arrival youths in the School-based mentoring program to feel excluded for the general society of Hong Kong. Considering that adolescence is a stage when youths seek acceptance (APA, 2000), their desire to integrate into the mainstream society may cause them to be more receptive to their mentorsô advice on how to relate with their peers than locally born youths, which result in their enlarged peer circles. Having more friends may increase their sense of belonging to school and the larger society, resulting in enhanced levels of psychological health. The assumption is supported by current acculturation literatures which show that immigrant youth who are more willing to integrate in the larger society tend to have better psychological outcomes (Berry, Phinney, Sam & Vedder, 2006) and those with higher sense of school belonging have lower levels of depression and higher levels of self-efficacy (Kia-Keating & Eills, 2007).

5.4. Strengths and Limitations of the Study

This section discusses the strengths and limitations of this study. I first discuss the strengths and limitations of the quantitative strand, followed by the qualitative strand. Last, I talk about the challenges in merging the quantitative and qualitative findings.

5.4.1. Quantitative Study

The main limitation of the quantitative part of the study is the lack of control over the data collection process. Because of this, I carried out extensive data management process, under the supervision of the project manager at Network for Health and Welfare Studies, to understand the data set and to tailor it to suit my data analysis plan. Yet, some of the limitations still exist. The convenience sampling strategy, the non-random missingness in the data set, the inability to establish causal inferences between mentoring relationship and psychological health, the lack of empirical evidence supporting that mentoring is a social capital intervention and the use of the multidimensional measurement model of psychological health affect the interpretation of the quantitative findings.

Nevertheless, the longitudinal quantitative data is one of the first large scale data set available in Hong Kong to examine the effect of mentoring on youthsôdevelopmental outcomes. While the findings may be biased, they still provide first-hand information to move research, practice and policy forward in the area of childhood poverty alleviation and mentoring as a social capital intervention. In addition, the qualitative strand of this study partially overcomes the limitations by cross-validating and expanding the quantitative results.

Convenience Sampling. Convenience sampling strategy was used to recruit the participants in the quantitative strand. A convenience sampling can lead to the over representation of a particular group within a sample (Drake & Johnson-Reid, 2007). Participants

of the Child Development Fund Program may be largely represented by those who are eager to make change or who feel that they need external help. Because of this, findings evaluating the psychological health of the youth may be more favorable than it seems.

Another disadvantage of convenience sampling is the limitation in the generalizability of the findings. Even though a large sample size is used in this study, the non-representative sample makes it difficult to generalize the findings to all youths living in poverty in Hong Kong. Yet, despite its disadvantages, convenience sampling strategy is commonly used in social science research because the relative cost and time required to carry out convenience sampling are smaller than other randomized sampling strategy (Drake & Johnson-Reid, 2007) .

Non-random missingness. Findings of the missing analysis show that missingness is associated with the participantsô family socio-economic status, gender and their age. In particular, missingness in round 4 for all time varying variables is associated with the families having experienced financial difficulty. In round 5, male participants, being older or living in single parent family, are associated with the missingness. Such non-random missingness means that some participants are excluded systematically, resulting in biased estimates (Newman, 2003). A stimulation study comparing the random missingness and non-random missingness in the longitudinal data set also shows that systematic missingness creates a relatively high level of biases in the results than non-systematic missingness (Newman, 2003).

Considering that the high level of missingness in psychological health was associated with indicators of childhood poverty, gender and age at enrollment at various rounds of data (See Appendix F), I examined the interaction effects between mentoring relationship and these covariates collected at baseline to see if the effect of mentoring relationship on psychological health differs between youths of different familial socio-economic status, gender,

and who entered the program at older versus at younger ages. Findings showed that none of the interaction effect was statistically significant, except for the one between having experienced financial difficulty and mentoring relationship. However, considering that the main effect of mentoring relationship was not statistically significant, the interaction effect had little value. As such, it is concluded that the missingness in the data set does not create different results between youths with better versus poorer socio-economic background, between male and female participants, and between older and younger participants. For details of the results, please refer to Appendix G on the section titled, *Data Missingness and Effect of Mentoring relationship on Psychological Health*.

In addition, the problem of systematic missingness is common in longitudinal study (Newman, 2003). Because of the multiple data collection waves, it is inevitable that some participants may drop out during the course of the study. A close examination of the data shows that missingness in this study is not associated with participantsôoutright refusal to answer some of the questions in the survey, which makes the issue less problematic (Collins, Schafer & Kam, 2001). The missing data technique of FIML was used to protect against this threat (Newman, 2003).

Last, this limitation is partially overcome by the qualitative study. Although the direct effect of mentoring and parent-child relationship on psychological health and the mediating effect of parent-child relationship found in the quantitative strand may be biased, qualitative information cross-validates the results. Qualitative information also demonstrates the positive effects of mentoring on psychological health and the mediating role of parent-child relationship. The converged results provide additional research evidence that improve the internal validity of the quantitative findings.

Inability to Establish Causal Inferences. A key limitation of this study is its inability to establish a causal inference between mentoring relationship and psychological health. First, considering that study is an observational study, but not a randomized control trails, I am not able to draw conclusions on the causal effect of mentoring relationship on the psychological health of youths. Second, because the Child Development Fund Program is a multicomponent program, there is a chance that the savings and the goal settings components of the program may have also affect the positive outcomes of the youths. Because I did not control for these two components in the analysis, the sole effect of mentoring relationship was not teased out. In addition, the Child Development Fund Program might be associated with other positive developmental outcomes, which was associated with the positive psychological health of the mentees. Such confounding effects make it impossible for me to conclude that mentoring relationship lead to the positive psychological health of youths.

Multidimensional measurement model of psychological health. Another limitation of this study is the method of measuring the main outcome of interest, psychological health. This study uses the measurement of General Health Questionnaires -12 (GHQ), which adopts a two factor measurement model to simultaneously capture the psychological aspects of depression and self-efficacy. Because depression and self-efficacy are distinct constructs, putting them together in one measurement makes it difficult for us to understand the specific effects of mentoring on youthsô psychological health. Although the constructs of depression and self-efficacy are closely related, measuring them separately can provide us with more details in how mentoring is associated with the particular aspects of psychological health in the mentees.

Again, this limitation is partially overcome by the qualitative findings. Information from the interviews is able to identify the different aspects of psychological health associated with

mentoring. The types of psychological health identified in the interviews are, positive affect, self-confidence and motivation. Qualitative information further recognizes the specific linkages between different types of social resources embedded in mentoring relationship and the different aspects of psychological health. Such findings offer us pilot information to understand the positive effects of mentoring on specific psychological constructs. Further quantitative research can be carried out to confirm these pathways.

5.4.2 Qualitative Study

While the quantitative strand of this study provides a general overview of the effects of mentoring relationship on psychological health, the qualitative strand does not only cross-validated the quantitative findings but also adds depth to this dissertation research. In addition, involving both mentees and mentors in the interviews allow me to cross-validate the information provided by both parties, at the same time, I can compare the different perceptions of the mentors and mentees on their mentoring relationship. Nevertheless, there are two major limitations in this qualitative study, which are convenience sampling strategy and researcher bias.

Convenience sampling. Participants of this School Based Problem Solving Skills Mentoring Program were selected by the teacher in charge at the participating school. While all mentees were from low-income families, the teacher tended to select students who demonstrated high potentials to benefit from the intervention, as well as those who were eager to join the program. As such, findings may be more favorable than it seems.

Additionally, the participating school is renowned for having an extensive supportive system that cultivates a positive growing environment for their students. All participants indicated in the interviews that they were extremely pleased with their teachers because the staff at the school demonstrated high levels of involvements and commitments. Mentees of this

program may represent a unique group of adolescents who are placed in a favorable school environment not typically available to other young people from disadvantaged backgrounds. As such, similar to the quantitative study, this sampling strategy may result in a non-representative sample, which limits the external validity of the findings.

Nevertheless, the use of convenience sampling strategy is often inevitable in small scale intervention study jointly organized by a university and an organization. For this dissertation, it makes sense that the participating organization prioritizes the interests of students before research initiatives. From the perspective of the school, what matters is whether or not the students can benefit from the program. Since the project is collaborative in nature, it is difficult for the research institute to negotiate with the participating organizations on who to include in the mentoring program.

Researcher Bias. Researcher bias is unavoidable in this dissertation research. Considering that I am the sole researcher of this study, the interpretation of the qualitative information is subject to my biases. To overcome this weakness, strategies were implemented to increase the vigor of this research. First, with reference to existing theories, I established broad categories to guide me in identifying the codes during the data analytic stage. This step by step analytic process ensured the transparency of the study, at the same time, prevented me from going off-track (Boyatzis, 1998). Second, a doubling coding technique was adopted to confirm findings and check for researcher bias. Having two coder increases the reliability of this study (Charmaz, 2006). Last, to the best of my ability, I attempt to remain objective when analyzing the data and reflect the truth of the interview information.

5.4.3. Mixed Methods Design

The use of a mixed methods design in this dissertation adds breadth and depth to the results. While the quantitative study offers a general overview of the findings, the qualitative study allows us to dig deeper to understand how mentoring works. I decided to use two different data sets in this mixed methods research because the dissimilar programsôcontext and orientation as well as population characteristics offered ñrichness to the findings by obtaining different but complementary data on the same topicò (Morse, 1991,p. 122). Because the quantitative and qualitative strands are totally independent, the converged findings provide strong research evidence on the statements that positive mentoring relationship can improve the psychological health of youth and that parent-child relationship mediates the effect. The use of data transformation technique by quantifying the qualitative data made it easier for me draw conclusions on the qualitative data as well as compared the two sets of findings (Creswell & Clark, 2007). However, at the same time, the differences in the two data sets may made comparing and relating the data difficult. The following are some of the limitations associated with the merging process of this mixed methods research design.

Discrepancy in Sample Size. One of the limitations associated with the parallel mixed method design of dissertation is the discrepancy in the sample size of the quantitative and qualitative data set. In parallel mixed methods research, it is recommended that equal weight should be given to both the quantitative and qualitative study (Creswell & Clark, 2007). The fact that the sample size of the quantitative strand of this dissertation largely exceeded that of the qualitative strand creates an inclination for me to put more weight in the quantitative data, which is very common in parallel convergent design (Creswell & Clark, 2007). This limitation was partially overcome by the fact that the qualitative data turned out to offer rich information on

mentoring (Bryman, 2007). As such, additional attention was given to writing up the qualitative findings, resulting in a more balanced weighing on the quantitative and qualitative strands.

Dissimilar programs and participants. The quantitative and qualitative strands consisted of participants of two different mentoring programs. Such dissimilarity in program designs and characteristics of the participants resulted in the contradictory findings in the quantitative and qualitative study. While the traditional approach in resolving the issue is to gather additional data to resolve the contradiction (Creswell & Clark, 2007), the limited time and resources for conducting this dissertation make it not feasible to do so.

5.5. Implications of the Study

This research informs future practice, research and policy in the area of mentoring, psychological development of disadvantaged youths and childhood poverty. The primary benefit of this research is the generation of evidence-based knowledge on the design and implementations of mentoring interventions. Best practices are identified, and practitioners can use the information to select and train mentors. Although research evidence on mentoring has been well established in the United States, this kind of social intervention is still at a novel stage in Hong Kong. Through generating research evidence, we come to understand how mentoring interventions work in the unique social context of Hong Kong.

5.5.1. Research Implications

This dissertation explored the conceptualization of mentoring as a social capital intervention. Although findings support the notion that the process of connecting a young person to a significant adult can increases the young personôs social capital, additional research is needed to refine the concept of mentoring, and understand how it be a social capital intervention.

In addition, the findings from the qualitative interviews are considered preliminary, further research is necessary to consolidate the results.

Because my dissertation did not address how menteesô use the resources in mentoring to improve their psychological outcomes, future mentoring research can design questionnaires to measure how well the mentees have used the such resources. The suggestion is based on Senôs capabilities approach (1999), which states the importance of importance of individualsô freedom in using the resources to improve their well-being. Understanding how individuals choose to utilize available resources will not clarify the conceptualization of mentoring as a social capital intervention, but also provide ideas on how to enhance the effectiveness of mentoring interventions.

In addition, further studies can also be carried out to explore the role of peer relationships in mentoring programs. The first batch of the Child Development Fund Program, which this dissertation research obtained data from, was community-based. Yet, starting from the fourth batch, this program has shifted from being community to school based. This change provides an excellent platform for researchers to understand the effect of mentoring on menteesô peer networks at school settings. Comparison studies can be conducted to contrast the peer social networks of youths with and without mentors. Results of this proposed study will provide additional evidence on mentoring as intervention that establishes the bonding social capital of peer relationships for youths.

Apart from offering additional evidence supporting mentoring as a social capital intervention, future studies should also strive to establish causal effect between mentoring and outcomes. Because randomized control trials are the gold standard intervention research, future studies testing the effectiveness of mentoring should use a random sampling strategy to select a

representative sample. In addition, randomizing experimental and control groups can also provide sound evidence on the causal effect of the interventions.

On the program level, implementation research can be conducted to inform the process of mentoring. The preliminary findings of the qualitative strand of this dissertation research guide future quantitative research. Qualitative findings, which tell us about the characteristics of high quality mentoring, can be utilized to formulate a measurement model for mentoring relationship unique to the social context of Hong Kong. Qualitative information suggests that, the adult-friend role adopted by the mentors, menteesô feeling of trust and being important and perceived high availability of mentors, contributes to positive mentoring relationship. Future studies can establish a mentoring scale based on these four dimensions. Researchers can also establish a measurement on evaluating the levels of social resources, namely direct advice, role-modeling, encouragement and companionship embedded in mentoring.

Apart from establishing mentoring measurements, future studies can also compare the effectiveness of community-based and school-based mentoring programs in Hong Kong. Although previous study carried out in the United States has demonstrated that school-based mentoring programs seem more efficient than community-based program (Portwood & Ayers, 2005), it is difficult to reach this conclusion for mentoring programs in Hong Kong without empirical evidence. Future studies can compare the effectiveness of community- and school-based mentoring programs to inform us on which mode of delivery is better in the unique settings of the city.

On the policy level, cost-benefits research on mentoring can be carried out to examine how to help youths living in poverty in Hong Kong as much as possible by using least resources. Although mentoring programs yield relatively less monetary cost than other social programs due

to its voluntary nature, the cost of time devoted by mentors in establishing good mentoring relationship is high. Nevertheless, considering the potential of mentoring in enhancing the well-being of poor youths, the benefits of the intervention, which include changes in the use of health services, overall college admission rates or juvenile delinquency, may outweigh the cost. Thus, longitudinal cost-benefits studies that measure and analyze all costs and benefits associated with mentoring interventions are necessary to understand how we can make the most out of such a social program.

While this dissertation focuses on exploring mentoring as a social capital at the micro-level, future research should extend beyond this scope and understand mentoring as a social capital at the macro-level. Instead of focusing on individual outcomes, studies should aim to examine the social benefits of mentoring, such as increasing community connectedness or enhancing the overall educational attainment level of the city (Putuman, 2001; Helliwell & Putnam, 1997). Community randomized control trails can be conducted to compare the social outcomes of communities with and without mentors. If mentoring is proven to be effective in enhancing social capital at the macro-level, then, it will no longer be an intervention program that only foster the development of youths in poverty, but a social programs that benefits society as a whole.

Last, results of Aim 1 of this dissertation, that is operationalizing childhood poverty, can be replicated using census data. Findings will provide a direction on the establishment of an official childhood poverty line in Hong Kong. This official definition is expected to help us better identify youths in need. Other studies can also be carried out to compare the differences in using the existing official income-based poverty line and the definition of childhood poverty proposed in this dissertation in identifying youths living in poverty in Hong Kong.

5.5.2. Practice Implication

Findings of this dissertation provide valuable information on the best practices of mentoring in Hong Kong. While resources are embedded in mentoring relationship, we need to know how practitioners can increase menteeôs access to these resources. Findings of the qualitative part of the study, which identify the types of resources embedded in mentoring and the characteristics of good mentoring relationship offer us with preliminary information on in this area. In the following, I will discuss the the goals of mentoring, selection of mentors, mentors training, timing of the mentoring program and selection of mentees.

Goals of Mentoring. Two important messages emerge from this research with regard to the goals of mentoring program. First, the quality of mentoring matters. Therefore, the first step in mentoring is relationship building. Second, in order to promote the psychological health of the youths living in poverty, practitioners should include improving parent-child relationshipas one of the goals in mentoring.

Fostering positive mentoring relationship is the first step to effective mentoring. Previous research on the longevity and goals settings of mentoring interventions finds that establishing good mentoring relationship is the foundation of success (Grossman & Rhodes, 2002; Morrow & Styles, 1995). Mentoring programs that last longer than a year show higher levels of benefit than those that last shorter (Grossman & Rhodes, 2002). In addition, mentoring programs, which first target at relationship building, show higher levels of success than those that focus more on transforming the youth at an early stage (Morrow & Styles, 1995). Therefore, the primary goal of mentoring programs should be on building positive relationships between mentors and mentees.

In addition, program designers can consider including improving parent-child relationship as one of the ultimate goals in mentoring. Findings of this dissertation and literatures

offer evidence that parent-child relationship plays a role between mentoring and youthsô psychological health. Hence, mentoring programs that focus on the positive psychological health of youths can also target at enhancing parent-child relationship.

Selection of Mentors. Current findings also offer information on the selection of mentors. According to the qualitative information, mentors need to know how to balance their roles as both friends and adults in the lives of their mentees. As friends, mentors should do fun activities with their mentees and listen to their menteesôissues. In order to do so, we need to select mentors who are young at heart and empathetic enough to understand the world of their mentees. As advisors, mentors need to be mature and experienced enough to provide the mentees with sound advice. In addition, they need to be devoted and committed to establish a good relationship with their mentees.

Mentors Training. Trainings for mentors should first focus on building trust with the mentees. According to the qualitative information, the best way to establish trust is to make the mentees feel important. After trust is established, mentees will be receptive to the advice of their mentors. Second, considering that direct advice is the most important social resources embedded in mentoring, trainings can focus on training mentors to be good advisors. As suggested by the qualitative interviews, mentors who lecture or disapprove encounter difficulty in building positive relationships with their mentees. Therefore, to enhance the effectiveness of mentoring interventions, mentors need to be trained to offer advice in friendly and accepting manners.

Timing of the Program. Timing for program enrollment is also important. Quantitative findings of specific aim 2 show that as the adolescents get older, they tend to have poorer psychological well-being. The results imply the importance of early intervention. Mental

health specialists also emphasize early interventions to prevent the development of mental illness in adolescents (Kutcher & Venn, 2008, Kessler, Berglund, Demlem Jin, Merikangas & Walter, 2008). From the public health perspective, interventions that can promote the psychological health of youth will significantly decrease health expenditures in the long run (SCMH, 2003). Since the transition from primary to secondary school in Hong Kong can be stressful for young people (Chung, Elias & Schnieder, 1998), because of the remarkable shifts in school environment, curriculum and social circle, mentoring programs can be implemented as part of a school-based program when youth enter secondary school.

Selection of Mentees. We need to select mentees who are living in households with income just above the poverty threshold. According to results of specific aim 1, this group of young people can benefit most from the social resources provided by mentoring. As aforementioned, the meaning of childhood poverty for young people who are not living in welfare receiving households is the deprivations of parental investment and positive familial environments. Therefore, this group of young people will benefit most from mentoring interventions, which can provide them with the social resources they are missing for positive psychological development.

5.5.3. Policy Implication

The political environment in Hong Kong makes it a good time to conduct childhood poverty research for youths living in poverty. After the current Chief Executive of Hong Kong, Leung Chun-Ying, took office in July 2012, he reappointed the Commission on Poverty. Apart from the establishment of the official poverty line (Census & Statistics Department [HKSAR], 2013), it is about time for the government to further define childhood poverty in Hong Kong. Results of Aim 1 of this dissertation offer a clear direction for the government to adopt existing

indicators to establish an official definition of childhood poverty. An official definition will allow the government to evaluate the situation of youths living in poverty in Hong Kong objectively as well as inform us on the effectiveness of various youthsôprograms in alleviating childhood poverty.

As for mentoring programs, the government further set aside $300 million for the continuous implementation of the Child Development Fund Program. In addition to the government initiatives, mentoring makes sense to people regardless of their political agenda (Walker, 2006). No one will deny that having caring and experienced adults as role model helps the positive development of youths. In addition, most mentoring programs are on voluntary basis. Furthermore, the charitable nature of mentoring programs taps into the value of altruism. Hence, mentoring programs are expected to receive much public support.

This dissertation offers preliminary results on supporting the positive effect of mentoring relationship on psychological health of youths, which encourages the continuation of the Child Development Fund Program. Starting from 2014, the Child Development Fund Program is also launching school-based mentoring programs in different school districts of Hong Kong., findings of the qualitative strands may be particularly useful informing practitioners on how to design the mentoring component of the program. Nevertheless, more rigorous research design is needed to provide further empirical evidence supporting the mentoring component of the Child Development Fund Program as effective in enhancing the psychological health of youths.

5.5.4. Conclusion

The future direction of this research for policy is the use of mentoring as a way to promotion social connectedness among people of different socio-economic backgrounds. While there are many ways to improve social connectedness, mentoring can be one of the interventions.

The process of bridging a middle to upper class adult with an adolescent from low-income families connect different members of the community together. A concrete example is the bridging of a local middle or upper class adults with a new arrival youth from low-income families. The establishment of the relationship do not only brings the world of the rich and poor together, but also helps the new arrival youths integrate into our society. Considering the escalating conflicts between residents of Hong Kong and arrivals from Mainland China, offering mentoring interventions for new arrivals youth can be perceived as a social policy that helps new arrivals youths integrate into the larger society, and in the long run, enhance social connectedness.

In addition, the process of bridging the mentors with mentees can be perceived as the transfer of social resources from the middle or upper class adults to youths from low-income families. In the long run, such transfer of social resources is expected to enhance the positive adulthood outcomes of poor youths. Hence, mentoring is an intervention that re-mobilizes community resources from the rich to the poor through bridging between different classes of people in a society.

Considering the possibility of mentoring as a social policy for enhancing community connectedness, a major concern for policy marker is to enhance the effectiveness of mentoring programs. In the process of planning mentoring intervention as a social program, the government needs to come up with ways to recruit mentors who are committed and devoted. One of the ways is to promote the atmosphere of volunteerism and altruism in Hong Kong. It is strange to find out that Hong Kong, as one of the top 20 charitable regions, has a low level of volunteerism (Charities Aid Foundation, 2013). Such an index reflect that Hong Kongers may be more incline to perform acts of kindness through money donation than through concrete helping behaviors.

Yet, findings of this dissertation repeatedly suggest that materialistic good is not the most important elements that youths living in poverty need. Rather, it is positive social relationships that can promote their developments. Hence, pairing the youths with devoted mentors seems a feasible solution.

In order to implement large scale mentoring programs to foster positive youth developments, the government first need to cultivate a social atmosphere that makes people feel committed to help each other (Yip, 2014). Through creating an altruistic society, people will develop the initiative to help one another. Such an attitude will definitely increases the number of adults who are willing to participate in mentoring programs with devotion, love and commitment.

Appendices

Appendix A: Ethnical Approval Documents **183**
Appendix B: Measurements **184**
Appendix C: Measurement Validation **191**
Appendix D: Interview Questions **194**
Appendix E. Technical Appendix for Aim 1 ..... **197**
Appendix F. Technical Appendix for Aim 2 ..... **199**
Appendix G. Technical Appendix for Aim 3 ..... **208**

Appendix A: Ethnical Approval Documents

Washington University in St.Louis
Human Research Protection Office
FWA00002284

Barnes Jewish Hospital
St. Louis Children's Hospital
Washington University

May 20, 2014*

PI: Hor Yan Lai
Department: Social Work

Re: HRPO number: 201309111
Project Title: Understanding Mentoring for Adolescents in Hong Kong: Psychological Health, Social Networks and Childhood Poverty
Funding Source: Departmental

Dear Ms. Lai,
The Washington University Human Research Protection Office (HRPO) reviewed your project and determined that it does not involve activities that are subject to Institutional Review Board (IRB) oversight.

HRPO complies with federal regulations of the Department of Health and Human Services (HHS) and the Food and Drug Administration (FDA) which limit IRB review and approval to any activity that represents *research involving human participants* (HHS) or a *clinical investigation* of a *test article* involving one or more *human participants* (FDA). (See HRPO Policies & Procedures Section II.G. for complete definitions.)

Because the data for your project was not collected for the purposes of your study and we have received assurances that you will only receive de-identified data as well as the qualitative data being recorded without identifiers, both the qualitative and quantitative activities are not considered to meet federal definitions under the jurisdiction of an IRB and therefore fall outside the purview of the HRPO.

Continuing review of this activity is not necessary. However, if activities change such that they may be considered to meet the above definitions, please contact HRPO before implementing those changes.

If further information is necessary, or if you believe we have misunderstood the intent or scope of your planned activity, please contact our office at 314.633.7400.

Sincerely,

Tracey Richmond, M.A.
Expedited Review Specialist

*This letter supersedes the version of this letter dated December 30, 2013.

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Mailing Address: 660 South Euclid Ave., Campus Box 8089, St. Louis, MO 63110

Appendix B: Measurements

General Health Questionnaire-12

	比平常少很多 Much Less than Usual	跟平常一樣 As Usual	比平常多 More than Usual	比平常多很多 Much more than Usual
你最近幾個星期是否做什麼也都能集中精神?· **In the past few weeks, have you been able to concentrate on whatever you are doing?**				
你最近幾個星期是否很擔心，睡得不好?· **In the past few weeks, have you lost much sleep over worry?**				
你最近幾個星期是否感到自己好有用處?· **In the past few weeks, have you felt that you are playing a useful part in things?**				
你最近幾個星期是否可以有主見決定事情?· **In the past few weeks, have you felt capable of making decisions about things?**				
你最近幾個星期是否常常感到有精神壓力?· **In the past few weeks, have you felt constantly under strain?**				
你最近幾個星期是否覺得不能克服面對的困難?· **In the past few weeks, have you felt that you couldn't overcome your difficulties?**				
你最近幾個星期是否能夠開開心心地生活?· **In the past few weeks, have you been able to enjoy your normal day to day activities?**				
你最近幾個星期可以面對自己的困難?· **In the past few weeks, have you been able to face up to your problems?**				
你最近幾個星期覺得很不開心，悶悶不樂?· **In the past few weeks, have you been feeling unhappy and depressed ?**				
你最近幾個星期對自己失了信心?· **In the past few weeks, have you been losing confidence in yourself?**				
你最近幾個星期覺得自己是無用處的人?· **In the past few weeks, have you been thinking of yourself as a worthless person?**				
你最近幾個星期大致上也是開心的?· **In the past few weeks, have you been feeling reasonably happy in general?**				

Mentoring Relationship Scale (Part 1)

	Not True at all 非常不真確	**Not Very True** 不太真確	**True** 真確	**Very True** 非常真確
我的友師時常問我想做什麼。 **My mentor almost always asks me what I want to do**	.			
我的友師和我喜歡做的事是有很多相同的。 **My mentor and I like to do a lot of the same things.**				
我的友師想出好玩和有趣的事去做。 **My mentor thinks of fun and interesting things to do.**				
我的友師和我做的事是我真的想做的。 **My mentor and I do thing I really want to do.**				
當我與我的友師一起時，我覺得特別。 **When I'm with my mentor, I feel special.**				
當我與我的友師一起時，我覺得興奮。 **When I'm with my mentor, I feel excited.**				
當我與我的友師一起時，我覺得重要。 **When I'm with my mentor, I feel important.**				
當我與我的友師一起時，我覺得快樂。 **When I'm with my mentor, I feel happy.**				
當我與我的友師一起時，我覺得厭倦。 **When I'm with my mentor, I feel bored.**				
當我與我的友師一起時，我覺得好仗憎。 **When I'm with my mentor, I feel mad.**				
當我與我的友師一起時，我覺得失望。 **When I'm with my mentor, I feel disappointed.**				
當我與我的友師一起時，我覺得不快樂。 **When I'm with my mentor, I feel sad.**				
當我與我的友師一起時，我覺得被冷落。 **When I'm with my mentor, I feel ignored.**				

	Never 沒有	Seldom 很少	Sometimes 有時	Always 經常
我的友師對我想做的事時常會感興趣。 **My mentor is always interested in what I want to do.**				
我接受我的友師跟我開玩笑的方式。 **My mentor makes fun of me in ways I accept.**				
我希望我的友師是不同的。 **I wish my mentor was different.**				
有時候我的友師承諾我們會一起做的事情，但我們沒有做過。 **Sometimes my mentor promises/promised that we will do something and then we don't do it.**				

Mentoring Relationship Scale (Part 2)

	Never 沒有	Seldom 很少	Sometimes 有時	Often 大部分時候	Always 經常
當我的友師給我意見時，會使我感到愚蠢。 **When my mentor gives me advice, it makes me feel stupid.**					
我覺得我不可以信任我的友師，我怕說出秘密，因為他/她會告知我的家人/監護人。 **I feel I can't trust my mentors with secrets - my mentor would tell my parent/guardian.**					
我希望我的友師多問我一些我的想法。 **I wish my mentor asked me more about what I think.**					
我希望我的友師了解我多一些。 **I wish my mentor knew my better**					
我希望我的友師多花一些時間和我一起。 **I wish my mentor spent more time with me.**					
當有事情煩擾我時，我把心裡的話說出來，而我的友師願意聆聽。 **When something is bugging me, my mentor listens while I get it off my chest.**					
我的友師給我很多好的意見去解決問題。 **My mentor has lots of good ideas about how to solve a problem.**					
我的友師透過和我一起做一些事，幫我忘記一些事情。 **My mentor helps me take my mind off things by doing something with me.**					
我的友師努力地嘗試瞭解我的發展目標（如學術，個人或其他）。 **I believe my mentor tries to understand my development goals (e.g., professionally/academically and personally).**					
我覺得因為我的友師，所以我更瞭解自己的方向。 **I feel as though I know my future better because of my mentor.**					
我從友師了解到不同的社會價值觀。 **I try to emulate the values of my mentor (such as social, academic, religious, physical/athletic).**					
我與友師的關係驅使我去尋找其他相似的關係。 **My relationship with my mentor inspires me to seek other relationships like this one.**					
我的友師給我帶來和其他成年人建立健康良好關係的機會。 **My connections with my mentor give me the opportunity to build up good relationships with other adults.**					

我的友師與我分享關於他個人的發展和成長經歷，豐富了我計劃個人發展的能力。 My mentor shares stories about his/her own experiences of personal development with me in a way that enhances my personal development.					
友師給我個人成長及生活上的建議。 My mentor gave me advice about my personal life.					
友師推動我把工作做好。 My mentor pushed me to do a good job.					
友師給我建設性的批評。 My mentors gave me constructive criticism.					
友師推使我獨立地去做事。 My mentor pushed me to do things on my own.					
我們傾談及分享個人發展的意見。 We talked together and shared ideas.					
當我看著友師做事時，我便會學到怎樣有計劃地去做事。 I learned how to do things by watching my mentor to do them.					
我從友師身上取得個人成長上知識，資料或技能。 I acquired knowledge, information or skills from my mentor.					
友師介紹給我新的見解，興趣及經驗，使我能為個人發展訂立計劃。 My mentor introduced me to new ideas interests, and experiences.					

The Relatedness Questionnaire with Parents

	非常不同意 Very Disagree	不同意 Disagree	同意 Agree	非常同意 Very Agree
我希望我的家長（或監護人）留意我多一些。 **I hope my parents (or guardian) will pay more attention to me.**	☐	☐	☐	☐
我希望我的家長（或監護人）可以花多一些時間和我一起。 **I hope my parents (or guardian) will spend more time with me.**	☐	☐	☐	☐
我希望我的家長（或監護人）瞭解我多些。 **I hope my parents (or guardian) will understand me more.**	☐	☐	☐	☐
我享受和家長（或監護人）一起相處的時間。 **I enjoy spending time with my parents (or guardian).**	☐	☐	☐	☐
我希望和家長（或監護人）更親近。 **I hope I am closer to my parents (or guardian)**	☐	☐	☐	☐
我希望可以對家長（或監護人）說更多的事。 **I hope I can talk more about different things with my parents (or guardian).**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得快樂。 **When I am with my parents (or guardian), I feel happy.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得輕鬆。 **When I am with my parents (or guardian), I feel relaxed.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得被冷落。 **When I am with my parents (or guardian), I feel ignored.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得好忿憎。 **When I am with my parents (or guardian), I feel mad.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得厭倦。 **When I am with my parents (or guardian), I feel boring.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得不快樂。 **When I am with my parents (or guardian), I feel unhappy.**	☐	☐	☐	☐
當我與家長（或監護人）一起時，我覺得安全。 **When I am with my parents (or guardian), I feel safe.**	☐	☐	☐	☐
當我與我的家長（或監護人）一起時，我感到重要。 **When I am with my parents (or guardian), I feel important.**	☐	☐	☐	☐
當我與我的家長（或監護人）一起時，我感到恐懼。 **When I am with my parents (or guardian), I feel scared.**	☐	☐	☐	☐
當我與我的家長（或監護人）一起時，我感到愛。 **When I am with my parents (or guardian), I feel loved.**	☐	☐	☐	☐

Social Network Survey

在過去的六個月內，當你有需要和別人傾訴你的情緒及人際關係時，你會找那些人聽你傾訴？從以下你認識的人裏，請指出是那些人，以及他們的人數。（可選擇多項答案）[xxxxx]
In the past six months, when you need someone to talk to about your feelings and interpersonal relationships, who did you talk to? Please indicate below who are these people. (You can check more than one answer)

1 ☐ 父親 Father
2 ☐ 母親 Mother
3 ☐ 兄弟姊妹，共ııııııııı 位 Siblings，number of siblings: _____
4 ☐ 老師，共ııııııııı 位 Teacher，number of teachers: _____
5 ☐ 同學，共ııııııııı 位 School mates，number of school mates: _____
6 ☐ 朋友，共ııııııııı 位 Friends，number of friends: _____
7 ☐ 學校社工，共ııııııııı 位 School social workers, number of school social workers: _____
8 ☐ 中心社工，共ııııııııı 位 Social workers at the non-profit organization, number of social workers: _____
9 ☐ 友師，共ııııııııı 位 Mentor, number of mentors: _____
10 ☐ 其他，請註明關係：ııııııııııııııııııı，共ııııııııı 位
Others, specify relationships：_____，numbers : _____

Appendix C: Measurement Validation

Participants in the School-Based Problem Solving Skills Mentoring Program were invited to also fill out the *Mentoring Relationship Scale* and *Relatedness Questionnaire with Parents* in order to obtain the face validity for these measurements. Such a mixed research method has been widely adopted for data validation (Creswell & Plano Clark. 2007). Interquartile thresholds of these two measurements were identified respectively to classify in the participants in the high, medium and low group in terms of their relationships with their mentors and parents. The scores on these two measurements were compared with the interview information provided by the mentees on their mentoring and parent-child relationship. In the following, I first presented the face validity of the mentoring relationship scale, then, the Relatedness Questionnaire with Parents.

C.1. Mentoring Relationship Scale

Table C.1 presents quantitative data from Mentoring Relationship Scale and qualitative information provided by the participants about their relationships with their parents. Findings showed that out of the 15 respondents who provided both quantitative and qualitative information, 5 of them showed complete agreement in their responses in the survey and interviews. For the remaining 10 respondents, although their responses did not coverage completely, 6 of the responses were geared towards the same direction. Such results suggest that this scale tended to achieve face validity.

Table C.1. Data Validation for Mentoring relationship Scale

id	Age	Gender	Mentoring Relationship Scale (Quantitative Data)	Classification	Parent Child Relationship (Qualitative Information)			Total Agreement	Same Direction
					Positive	Neutral	Negative		
1	16	1	n/a	n/a	1			n/a	n/a
2	17	0	109	low		1		No	No
3	16	1	145	high	1			Yes	Yes
4	15	0	144	high	1			Yes	Yes
5	17	1	122	medium	1			No	No
6	14	1	n/a	n/a			1	n/a	n/a
7	17	0	n/a	n/a		1		n/a	n/a
8	17	0	n/a	n/a	1			n/a	Yes
9	16	1	133	medium	1			No	Yes
10	18	0	143	medium	1			No	Yes
11	15	1	150	high	1			Yes	Yes
12	17	0	149	high	1			Yes	Yes
13	14	1	131	medium	1			No	Yes
14	14	0	158	high		1		Yes	No
15	16	0	n/a	n/a	1			n/a	n/a
16	17	1	104	low			1	Yes	Yes
18	15	1	112	medium		1		Yes	Yes
19	14	0	100	low		1		No	No
20	18	1	102	low		1		No	No
21	16	0	126	medium	1			No	Yes
22	15	1	132	medium	1			No	Yes
23	15	1	138	medium	1			No	Yes

Note : n/a = missing information

C.2 . Relatedness Questionnaire with Parents

Table C.2. presents the quantitative data from Relatedness Questionnaire with Parents and qualitative information provided by the participants about their relationships with their parents. Findings showed that of the 15 respondents who provided both quantitative and qualitative information, 10 of them showed an agreement in their responses in the survey and interviews. For the remaining five respondents, although their responses did not coverage completely, the responses were geared towards the same direction. Such results suggest that this scale has achieved face validity.

Table C.2. Data Validation for Relatedness Questionnaire with Parents

id	Age	Gender	Relatedness Questionnaire with Parents (Quantitative Data)	Classification	Parent Child Relationship (Qualitative Information)			Total Agreement	Same Direction
					Positive	Neutral	Negative		
1	16	1	51	High	1			Yes	Yes
2	17	0	47	Medium		1		Yes	Yes
3	16	1	51	High	1			Yes	Yes
4	15	0	34	Low			1	Yes	Yes
5	17	1	47	Medium		1		Yes	Yes
6	14	1	n/a	n/a	n/a			n/a	n/a
7	17	0	n/a	n/a	n/a			n/a	n/a
8	17	0	51	High		1		No	Yes
9	16	1	55	High	1			Yes	Yes
10	18	0	47	Medium	1			No	Yes
11	15	1	53	High	1			Yes	Yes
12	17	0	n/a	n/a			1	n/a	n/a
13	14	1	49	Medium		1		Yes	Yes
14	14	0	55	High	1			Yes	Yes
15	16	0	41	Low	n/a			n/a	n/a
16	17	1	43	Medium			1	No	Yes
18	15	1	44	Medium			1	No	Yes
19	14	0	n/a	n/a		1		n/a	n/a
20	18	1	n/a	n/a		1		n/a	n/a
21	16	0	44	Medium		1		Yes	Yes
22	15	1	n/a	n/a	1			n/a	n/a
23	15	1	44	Medium	1			No	Yes

Note : n/a = missing information

Appendix D: Interview Questions

D.1 Sample questions for interview with mentees

- 心理健康與人際網絡的改變 **Changes in Social Networks and Psychological Health**

- 你覺得你從今年年初開始有什麼改變（舉例）?· What changes do you see in yourself since January 2013 (Free Listing)?
- 你會如何解釋這轉變 ? How do you explain these changes?
- 你覺得這些改變有多少是因為師友計劃?· How do you explain these changes?
- 你在參與計劃後有什麼得著 ? Do you think you have learned anything from the programme?
- 你最近生活上有什麼煩惱?·從前有什麼煩惱?·對比從前是怎樣的?·你的煩惱有多小是與你的家庭環境有關?· What kinds of things will make you upset or feel troubled now? What about the past? (Freelisting). How much is your problems related to your familial situation? (Try to understand the downward trend in psychological development and how much of their well-being are related to CP)
- 你不開心時會做什麼?· 有問題時 · 你會如何處理?·你認識了義務導師前後有什麼分別?· How do you handle your problems? How different is it before and after you know your mentor?
- 你認識了義務導師後 · 有問題時 · 你會找誰聊 你認識義務導師前是怎樣的?· After you get to know your mentor, who will you talk to when you encounter problems (Free Listing)? What about before you get to know your mentor?
- 你認識了義務導師後 你的社交圈子有什麼改變?· After you met your mentor, how has your social circle been different?

- 有關師友關係 **About the mentoring relationship**

- 你與義務導師多久會聯繫一次 用何種形式聯繫 為了什麼原因聯繫?·這些聯繫為什麼是重要的?· How frequent is your contact with your mentor? And by what means? For what reason do you contact your mentor? Why is it important to you?
- 除了香港大學安排的活動外 · 你與義務導師還進行了什麼活動 活動的目的或目標是什麼 你怎樣參與計劃活動的過程?· Apart from the activities organized by HKU, what have you done with your mentors? Whatôs the purpose? How did you participate in planning the process of each of these activities?
- 你會與義務導師分享什麼 當你有困難或受困擾時 · 你會找義務導師嗎 ? What will you

share with your mentors? Will you approach your mentors when you have problems or feeling distressed?

- 你認為義務導師在你的生命裡扮演了什麼角色?· Who is your mentor to you? Like a friend? A Parent? A Teacheré or?
- 你認為你與義務導師的關係怎麼樣 ? How do you feel about your relationship with your mentor?
- 計劃結束後 · 你會透過什麼方法跟你義務導師聯繫?· After the program ends, will you keep in touch with your mentor?
- 如果讓你選 · 你會希望你在什麼時候認識你的義務導師?· If thereôs a choice, what time do you think is the best time for you to meet your mentor, so that you can make the best out of the relationship?

- 有關與家人的關係 **About Parent-child Relationship**

- 你平日會跟你爸爸媽媽分享一些什麼事情?·學業?·金錢問題?·與朋友的關係?·對未來的期望?· What do you talk with your parents about most of the time?
- 你可以告訴我你跟你爸爸媽媽最近一次聊天的情況嗎?· Can you tell me the last time you talk to your parents?
- 你上一次同你爸爸媽媽不開心的情況是怎樣?·在那個情況下 · 你做了什麼?· When was the last time you were unhappy with your parents? What did they and you do in that case?
  你爸爸媽媽怎樣影響你的心情和生活社交圈子 ? How does your parents affect your emotions and relationships with other people?ˇ understand effects of parent child relationships on outcomes
- 你跟義務導師的相處和你跟你爸爸媽媽的相處有什麼不同?· Does your interaction with your mentor differ from how you interact with your parents?
- 認識義務導師後 · 你和你爸爸媽媽的相處是怎樣?·認識義務導師前 · 你和你爸爸媽媽的相處是怎樣?·你認為為什麼有這些改變?·這些改變有多小與你和你義務導師的關係有關?·有多小是與解難課程有關?· Since you know your mentor, how war interaction with your parents? What about before you meet your mentor? How do you explain these changes? How much of it is related to your relationship with your mentor? How much of it is related to the problem solving skills training program?

D.2. Sample questions for interview with mentors

- 有關師友關係 **About the mentoring relationship**

1.你認為你與學生的關係怎麼樣 ?How do you feel about your relationship with your mentee?

2.你與學生多久會聯繫一次 用何種形式聯繫 ? How frequent is your contact with your mentee? And by what means?

3. 除了香港大學安排的活動外，你與學生還進行了什麼活動 活動的目的或目標是什麼 ? Apart from the activities organized by HKU, what have you done with your mentee? What's the purpose?

4. 你會與學生分享什麼 當學生有困難或受困擾時，他 她會找你嗎 ? What will you share with your mentee? Will your mentee approach you when he/she has problems or feeling distressed?

5. 你會怎樣向你的學生表達你對他們的期望?你怎樣鼓勵他們? How do you express your expectation on your student? How do you encourage them?

6. 如果你的學生讓你失望，你會如何處理?· If your mentee disappoints you, how will you deal with it?

- 有關學生 **About the mentee**

7.你認為學生參與計劃前及後有什麼不同嗎 特別在心裡健康及人際網絡上)? Do you see any difference of your mentee before and after joining the programme (especially in terms of their psychological health and social networks)

8. 你會如何解釋這轉變 ? How would you explain these changes?

9. 對你來說，你跟你學生的關係有多重要?· How important is your relationship with your mentee to you?

10.當學生的師友有沒有改變你的人生?怎樣改變?為什麼回有改變?· Do you think your mentor role has changed your life in anyway? If so, how and why?

Appendix E. Technical Appendix for Aim 1

Table E.1 showed the values of the fit statistics comparing a one class, two class of three class solutions. The model fit statistics of AIC, BIC, Adjusted BIC and Entropy were compared to decide whether a two class solution or a three class solution showed a better fit (Table E.1).

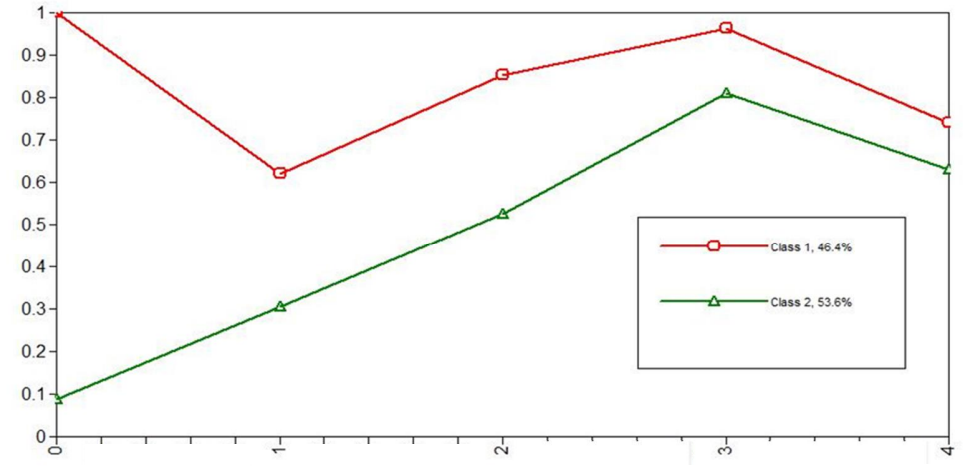
Table E.1. Comparison of Fit Statistics from One Class to Three Class Solution

One Class		Two Class	Three Class
3944.21	AIC	3791.88	3781.52
3966.90	BIC	3841.80	3858.67
3951.02	Sample Adjusted BIC	3806.86	3804.69
NA	Entropy	0.80	0.66
N=691	N for each class	0=384 1=343	0=71 1=244 2=376

For values of AIC, BIC and sample adjusted BIC, the lower the values the better the model fit. Findings showed that the two class solution was clearly better than the one class solution. Yet, values of the two class and the three class solution were similar. For entropy, a higher value showed a better class distinction. Findings told us that the two class solution had a more distinct split than the three class solution.

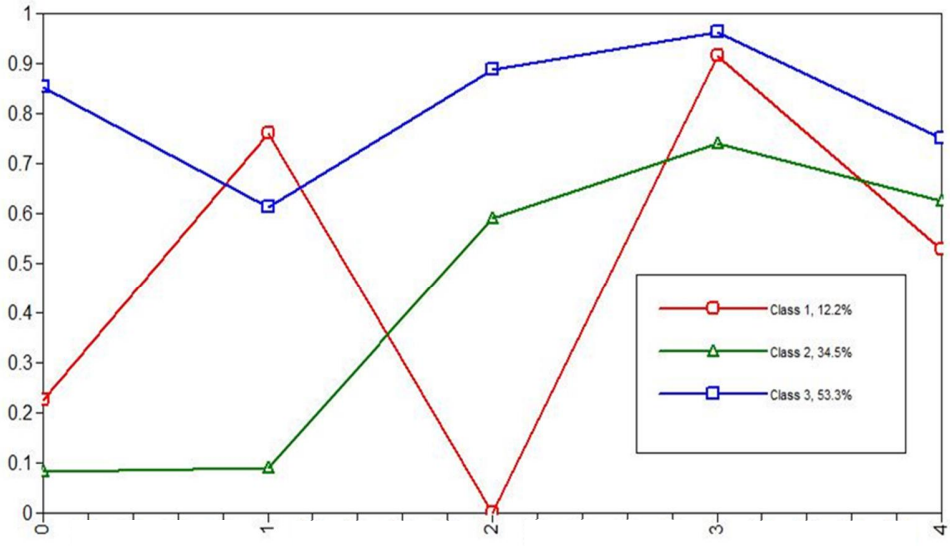
Figure E.1 and Figure E.2 showed the graphical solution of a two class and three class solution. A two class two solution (Figure E.1) showed a more distinct classification, with an even split, whereas a three class solution was rather uneven (Figure E.2).

Figure E.1. Latent Class Solution with Two Class Analysis



Receiving Social Security | Single Parent | Unemployed parents | Living in Rented Housing | Low Parental Education

Figure E.2. Latent Class Solution with Three Class Analysis



Receiving Social Security | Single Parent | Unemployed parents | Living in Rented Housing | Low Parental Education

Appendix F. Technical Appendix for Aim 2

Initial Data Analysis

Distribution of Psychological Health. Table F.1 shows the distribution of the outcome variable of psychological health at each separate rounds of data collection. Figure F.1 illustrates the distribution of the outcome variable of psychological health after I collapsed the data in round 1, 3, 4 and 5. According to the graphs, the distribution of the psychological health resembles a bell shape.

Table F.1. Distribution of the outcome variable of psychological health at separate rounds of data collection

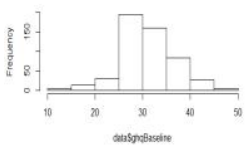
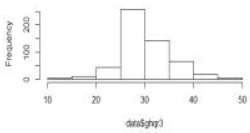
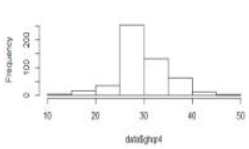
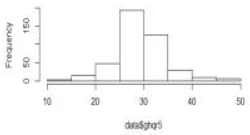
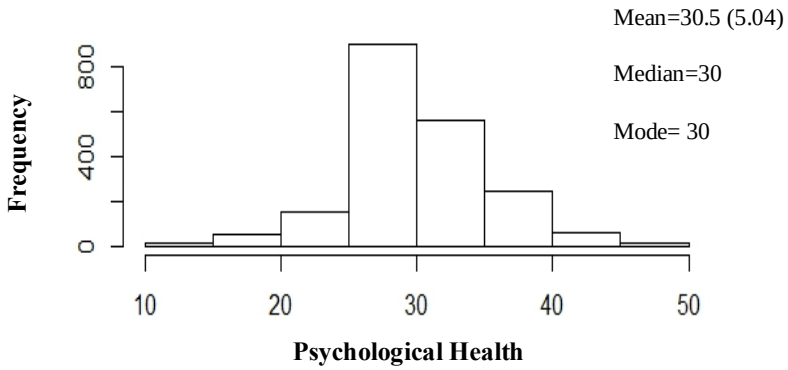
	Round 1	Round 3	Round 4	Round 5
Psychological Health				
	Mean=31.7 (5.53) Median=31 Mode= 30 Skewness=-0.09 Kurtosis= 4.36 N=514	Mean= 30.9 (5.01) Median= 30 Mode= 30 Skewness= 0.04 Kurtosis= 4.79 N=549	Mean=30.5(4.96) Median= 30 Mode= 30 Skewness=-0.32 Kurtosis= 4.55 N=519	Mean=30.1 (5.12) Median=30 Mode=30 Skewness=0.19 Kurtosis=5.18 N=430

Figure F.1. Distribution of Psychological Health



Missing Data. Missing data analysis on the outcome variable of psychological health was conducted using logistic regression. The outcome variable of psychological health for each round (i.e., Round 1, Round 3, Round 4 and Round 5) was dichotomized as a binary variable. This binary outcome variable (missing data=1, non-missing data=0) was regressed on participantsô demographics and socio-economic backgrounds. Table F.2 shows the results of the missing analysis. Those who had experienced financial difficulty tended to have a higher likelihood to be missing in Round 4. Male participants, those who were older, or living in single parent family, had higher likelihood of missing in Round 5.

Table F.2. Missing Analysis on the Variable of Psychological Health (GHQ)

	GHQ (Round 1)		**GHQ (Round 3)**		**GHQ (Round 4)**		**GHQ (Round 5)**	
Independent Variables	b	S.E.	B	S.E.	b	S.E	b	S.E.
Gender (Female=1)	-0.07	0.20	-0.09	0.21	0.06	0.20	-0.50*	0.18
Age at enrollment	0.12	0.06	0.05	0.60	0.07	0.06	0.17*	0.05
Family Income Status (Receiving Social Security =1)	0.11	0.22	0.27	0.24	-0.19	0.22	0.16	0.21
Housing Type (Rented Housing =1)	-0.27	0.29	0.36	0.36	0.46	0.33	-0.19	0.29
Parental Employment Status (Unemployed =1)	-0.01	0.23	0.24	0.24	0.09	0.23	-0.14	0.21
Parental Education Level (Low =1)	0.16	0.21	0.23	0.23	0.30	0.21	-0.15	0.20
Family Configuration (Single Parent=1)	-0.05	0.21	0.22	0.22	0.34	0.21	0.43*	0.19
Experienced Financial Difficulty (Yes=1)	-0.15	0.21	0.22	0.22	0.61*	0.21	-0.08	0.20
Perceived financial impact (Yes=1)	0.64	0.35	0.39	0.39	-0.57	0.37	0.12	0.34

Note: *p<.05

Exploratory Data Analysis

Bivariate Analyses. Bivariate analyses were performed to explore the associations between psychological health and the participantsô characteristics in order to inform subsequent multilevel analysis (Table F.3). Results suggested that participantsô initial age at enrollment were consistently associated with their psychological health at all rounds. Female participants scored lower in their psychological health at round 1, 3 and 4. Participantsô psychological health in round 1, 3 and 5 also differed between those with dissimilar levels of perceived parental financial impact. Findings suggested that these variables could be included in the final model. Yet, the actual experience of financial hardship and childhood poverty was also not associated with psychological health at all rounds. Nevertheless, theories and previous literatures suggested that family socio-economic backgrounds and financial hardships predicted psychological health, therefore, I decided to include the variables of childhood poverty and having experienced financial difficulty in the subsequent multilevel model.

Table F.3. Bivariate Analysis between Psychological Health and Participants' Characteristics

	GHQ Round 1 (Mean)		**GHQ Round 3 (Mean)**		**GHQ Round 4 (Mean)**		**GHQ Round 5 (Mean)**	
Participants Characteristics	n=514	Sig.	n=549	Sig.	n=519	Sig.	n=430	Sig.
Childhood Poverty		ns		ns		ns		ns
Poor	32.19		30.92		30.71		30.15	
Less Poor	31.30		30.88		30.35		30.12	
Financial Difficulty		ns		ns		ns		ns
Yes	31.90		30.10		30.62		30.17	
No	31.58		30.99		30.45		30.10	
Parental perceived negative financial impact		*		*		ns		*
High	30.16		29.57		29.74		28.51	
Low	31.99		31.09		30.66		30.33	
Gender		*		*		*		ns
Male	32.34		31.54		31.13		30.45	
Female	31.28		30.47		30.10		29.99	
Age at initial Enrollment	31.71 (5.5)	*	30.87 (5.0)	*	30.48(5.0)	*	30.12 (5.1)	*

Note: p*<.05

Need for Multilevel Model. Intraclass correlation was calculated using information from the null model (See Table F.4). Parameters of the random effects were used to calculate of the intraclass correlation coefficient (ICC), which offered empirical guidance on whether or not multilevel modeling was necessary. Value of the intraclass correlation coefficient (ICC) based on the null model (Model 4.0) showed that approximately 36% of the variance in general psychological health was accounted for by each individual (i.e., 10.07/10.07+16.77). The moderately high ICC value suggested that a multilevel model was necessary.

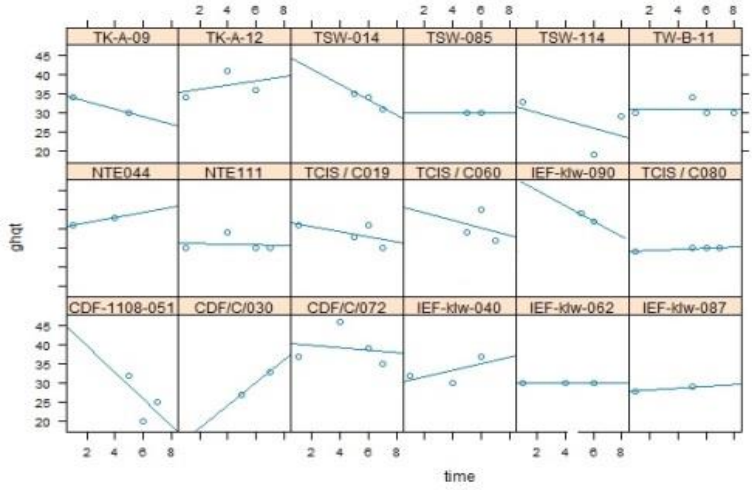
Table F.4. Multilevel models of Psychological Health on Time

Fixed Effects	**Model 4.0 (Null Model)**			**Model 4.1 (Unconditional Linear Growth Model: Intercept-varying)**			**Model 4.2 (Unconditional Linear Growth Model: Slope-varying)**		
	b	S.E.	t	b	S.E.	T	B	S.E.	t
Intercept	30.82	0.15	202.2	31.69	0.20	151.78	31.68	0.22	140.55
Time				-0.25	0.04	-6.11	-0.25	0.04	-5.66
Random Effects	$\mathring{u}^2$	Std. Dev		$\mathring{u}^2$	Std. Dev		$\mathring{u}^2$	Std. Dev	
Intercept (Participants)	10.07	3.17		10.16	3.18		17.99	4.24	
Slope (Time)							0.20	0.44	
Residual	16.77	4.09		16.35	4.04		14.95	3.86	
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**		**-2LL**	**AIC**	
	-6024	12055		-6008	12025		-6001	12015	
				χ^2	**df**				
Comparison of Model 0 to Model 1				36.92*	1				
Comparison of Model 1 to Model 2				13.85*	2				

*p<.05

Figure F.2 is an illustration of the plots of psychological health against time of 18 randomly sampled participants. The variation in the intercepts and the slopes between time and psychological health among the participants suggested that multilevel modeling is needed.

Figure F.2. Plots of Psychological Health and Time of 18 Randomly Sampled Participants



Intercept varying or slope varying model. Referring back to Table F.4, results of model comparison suggested that the intercept varying model was better than the null model (χ^2=36.92, df=1, p<0.05), and the slope varying model showed a better fit than the intercept varying model (χ^2=13.85, df=2, p<0.05). Empirical evidence suggested that subsequent models could be established based on the slope-varying model.

Linear or quadratic model. I further examined whether or not changes in psychological health in these youths resembled a linear or a quadratic development. Table F.5. shows results of the linear and quadratic model. Results of model comparison using ANOVA suggested that the quadratic model did not show a better model fit than the linear model (χ^2=0.04, df=1, p>0.05).

Table F.5. Multilevel Model Estimates of Effects of Time on Psychological Health

	Model 4.3 (Linear Model)			**Model 4.4 (Quadratic Model)**		
Fixed Effects	b	S.E.	t	b	S.E.	T
Intercept	31.68	0.22	140.55	31.70	0.23	134.45
Time	-0.25	0.04	-5.66	-0.27	0.14	-2.01
Time^2				0.004	0.02	0.20
Random Effects	**σ^2**	**Std. Dev**		**σ^2**	**Std. Dev**	
Intercept (Individual)	17.99	4.24		17.98	4.24	
Time	0.20	0.44		0.20	0.44	
Residual	14.95	3.86		14.96	3.86	
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**	
	-6001	12015		-6004	12022	
				χ^2	**Df**	
Comparison of Model 4.1.1 to Model 4.1.2				0.04	1	

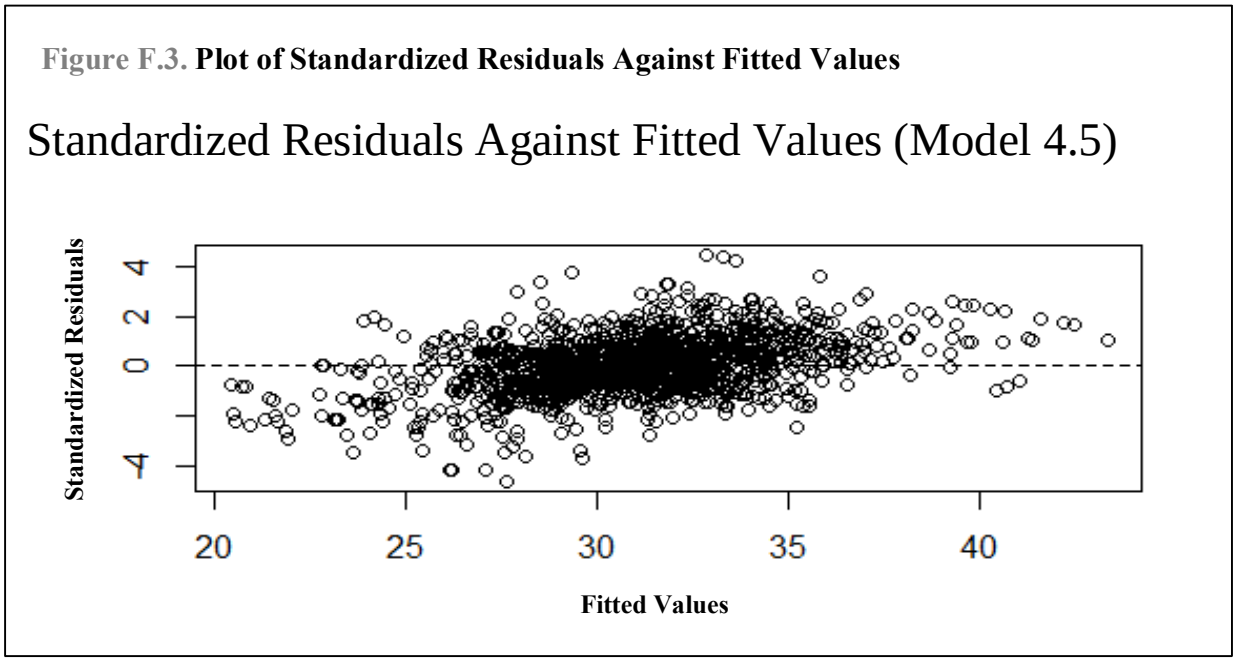
*p<0.05

Model Diagnostics (Model 4.5)

Model diagnostic procedures were taken to examine whether the assumptions of regression analysis were fulfilled in the multilevel model of 4.5 (Fox, 1991). Three steps were taken to check for (1) the problem of constant error variance and correlated residuals; (2) non-normal distribution of residuals; and (3) existence of outliers and influential data.

(1) Problem of constant error and correlated residuals. Figure F.3. illustrates the plot of the residuals of each observation against its fitted values, which was used to examine the existence of the problem of constant error variance and correlated residuals. The observations tended to be randomly scattered in the plot, suggesting that there were no systematic error in the regression.

Figure F.3. Plot of Standardized Residuals Against Fitted Values



(2) Problem of non-normal distribution of residuals. To examine the normality of residuals, a histogram and a QQ-plot of the residuals were generated (Figure F.4 &

Figure F.5). The histogram (Figure F.4) showed that the residuals tended to be normally distributed. The QQ-plot had two heavy tails suggesting the existence of outliers at both end of the distribution (Figure F.5) (Fox, 1991). A closer look at the outliers showed that 59 residuals had standardized residual values larger +2.5 and 1 observation smaller than -2.5.

Figure F.4. Histogram of Standardized Residuals

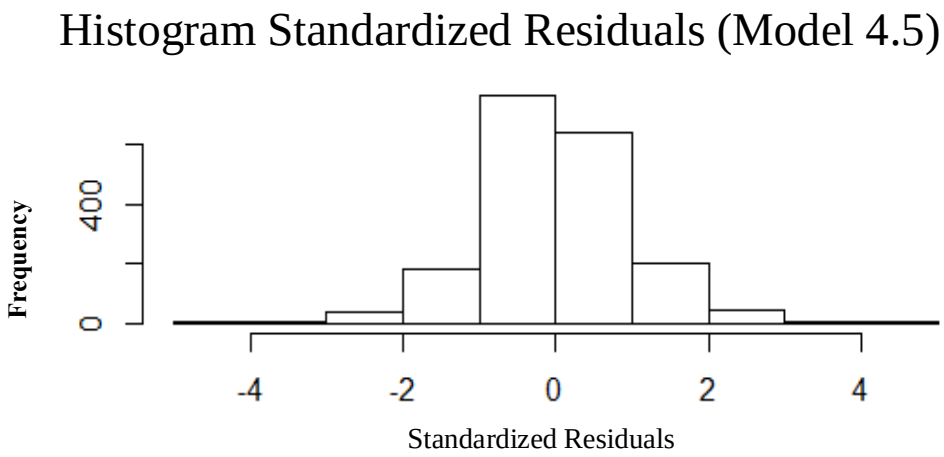
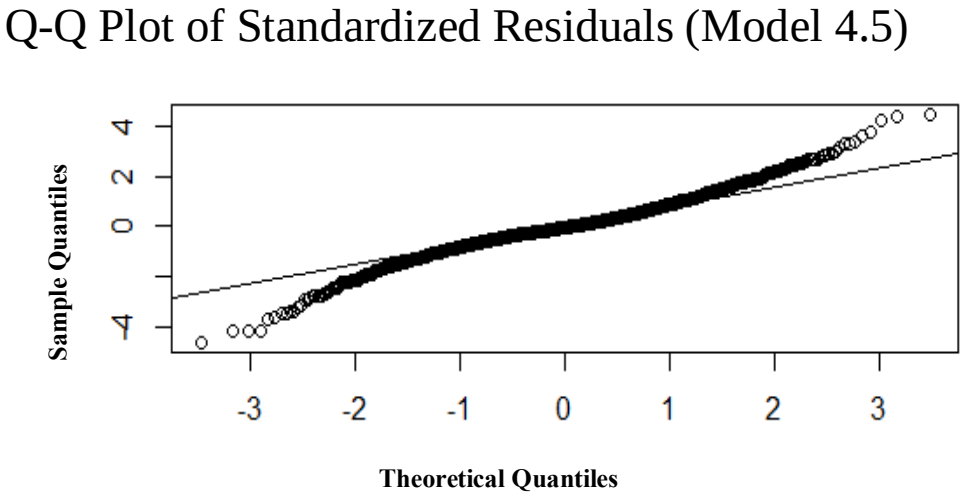
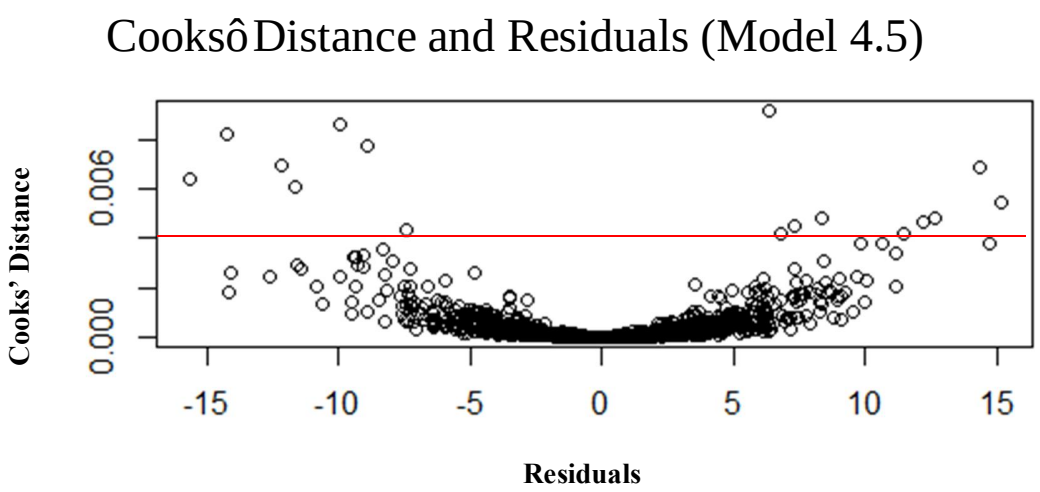


Figure F.5. Q-Q Plot of Standardized Residuals



(3) Existence of Outliers and Influential data. To further identify outliers and influential points, the cookôs distances of each observation were calculated and plotted against the residuals (Figure F.6). According to the plot, most data points had cooks distance value clustering below 0.003. Data points with cooks distance sustainably larger than the rest tended to have value large than 0.003 As such, the cutoff point of 0.003 was used to determine influential data point (Fox, 1991).

Figure F.6. Plot of Cooks Distance Against Residuals



A closer examination showed that out of the 49 outliers identified in the previous step, 14 of them also had cook distance values larger than 0.003. Data points with combination of high leverage and being an outlier suggested that they tended to have high influence on the regression coefficients (Fox, 1991). An examination on these data points showed that they were not problematic, therefore, all data points were retained.

Appendix G. Technical Appendix for Aim 3

Initial Data Analysis

Distribution of Psychological Health, Mentoring relationship and Parent Child relationships. Table G.1. shows the distributions of the outcome variables of psychological health, mentoring and parent child relationships at each separate rounds of data collection. The last column also showed the distribution of these two variables after I collapsed data of round 3, 4 and 5 together. According to the graph, the distribution of all variables resembled a bell shape. Values of central tendency, skewness and kurtosis also showed that these two variables were normally distributed.

Distribution of the variables of peers and family network size. Table G.1. shows the distributions of the outcome variables of peers and family network size at each separate rounds of data collection. The last column also showed the distribution of these three variables after I collapsed all rounds of data together. The distribution of these variables were negative skewed. Given that these variables of network size were considered counted variables, values of skewness and kurtosis were not calculated.

Table G.1. Univariate Analysis of Variables Used in this Study

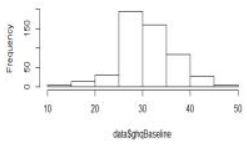
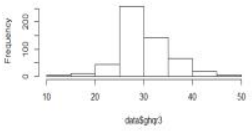
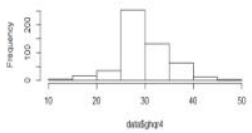
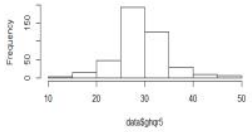
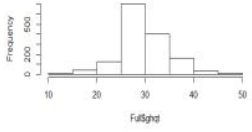
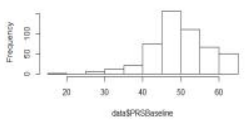
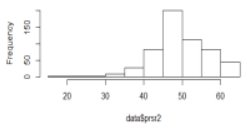
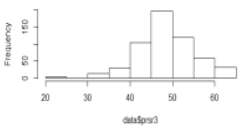
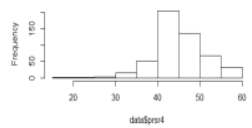
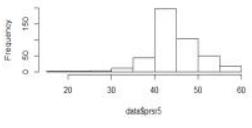
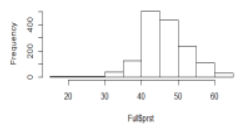
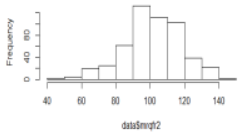
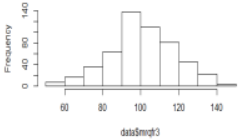
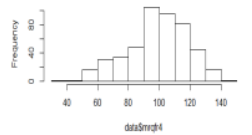
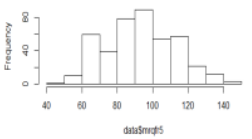
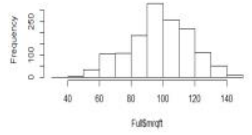
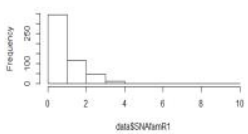
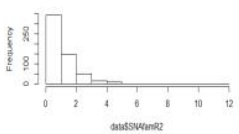
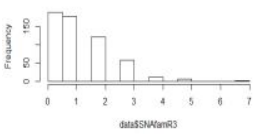
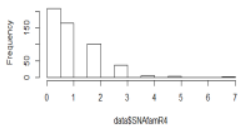
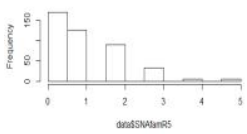
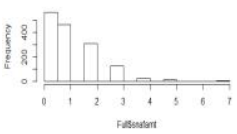
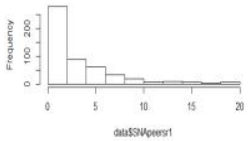
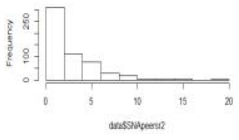
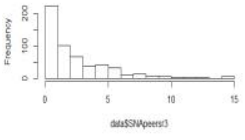
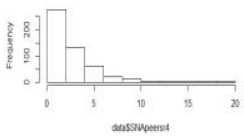
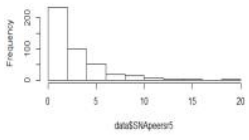
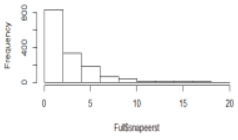
	Round 1	Round 2	Round 3	Round 4	Round 5	Round 3 to 5
Psycho-logical Health		N/A.				
	Mean=31.7 (5.53) Median=31 Mode= 30 Skewness=-0.09 Kurtosis= 4.36 N=514		Mean= 30.9 (5.01) Median= 30 Mode= 30 Skewness= 0.04 Kurtosis= 4.79 N=549	Mean=30.5(4.96) Median= 30 Mode= 30 Skewness=-0.32 Kurtosis= 4.55 N=519	Mean=30.1 (5.12) Median=30 Mode=30 Skewness=0.19 Kurtosis=5.18 N=430	Mean=30.5 (5.04) Median=30 Mode= 30 Skewness=-0.03 Kurtosis=4.80 N=1494
Parent-child Relation-ships						
	Mean= 50.1 (7.61) Median=50 Mode= 48 Skewness=0.44 Kurtosis= 3.78 N=502	Mean=49.9 (6.86) Median=49 Mode=48 Skewness=-.22 Kurtosis=3.70 N=562	Mean=48.9 (6.39) Median=48 Mode= 48 Skewness=-0.25 Kurtosis=4.13 N=556	Mean=45.8(4.99) Median=45 Mode=45 Skewness=-0.34 Kurtosis=4.99 N=517	Mean= 45.5(6.53) Median=45 Mode=45 Skewness=1.47 Kurtosis=16.06 N=431	Mean=46.81(6.46) Median=46 Mode=45 Skewness=-0.14 Kurtosis=4.53 N=1498
Mentoring Relation-ship	N/A					
		Mean=101.8(16.77) Median=102 Mode= 92, 108 Skewness=-0.31 Kurtosis=3.14 N=520	Mean=101.3(17.1) Median=101 Mode=104 Skewness=-0.06 Kurtosis=2.91 N=519	Mean=99.43(19.26) Median=101 Mode=96 Skewness=-0.42 Kurtosis=2.81 N=476	Mean=93.79(19.63) Median=94 Mode=69 Skewness=0.21 Kurtosis=2.73 N=423	Mean= 98.40(18.79) Median=98 Mode=97 Skewness=-0.17 Kurtosis=2.70 N=1414

Table G.1. (Continued) Univariate Analysis of Variables Used in this Study

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 3 to 5
Family Network Size						
	Mean=1.15 Median=1 Mode=0 N=502	Mean=1.28 Median=1 Mode=0 N=568	Mean=1.20 Median=1 Mode=0 N=561	Mean=1.01 Median=1 Mode=0 N=523	Mean=1.06 Median=1 Mode=0 N=431	Mean=1.10 Median=1 Mode=0 N=1511
Peer Network Size						
	Mean=3.46 Median=2 Mode=0 N=513	Mean=2.98 Median=2 Mode=156 N=562	Mean=2.74 Median=2 Mode=0 N=557	Mean=2.94 Median=2 Mode=0 N=521	Mean=2.93 Median=2 Mode=0 N=429	Mean=2.86 Median=2 Mode=0 N=1502

Bivariate Analysis. Bivariate analyses were conducted to understand whether or not participants of dissimilar familial socio-economic backgrounds and personal characteristics differed significantly in their quality of social relationships. Results of showed that the socio-economic backgrounds of the participants were not associated with their mentoring relationship, parent-child relationship, family and peer network size. For gender, female participants tended to have score higher on their quality of parent-child relationship and have larger peer network than male mentees. Menteesô age at enrollment to CDF was negatively associated with mentoring relationship in Round 3, 4 and 5, and it correlated negatively with parent-child relationship and family network size in all rounds of data. Yet, age showed a positive relationship with peer network size in all 5 rounds. Table G.2 to G.5 present results of the analyses. Because family network size and peer network size are count data, I reported their median instead of the mean value in Table G.4. and G.5. In addition, Wilcoxon Mann Whitney test was used instead of the two sample t-test to examine the relationship between the participantsô socio-economic backgrounds and their network size.

Table G.2. Bivariate Analysis between Mentoring relationship and Participants' Characteristics (MQR)

	MS Round 1 (Mean)		MS Round 2 (Mean)		MS Round 3 (Mean)		MS Round 4 (Mean)		MS Round 5 (Mean)	
Participants Characteristics	n.a.		n=520	Sig.	n=519	Sig.	n=476	Sig.	n=423	Sig.
Childhood Poverty	n.a.			n.s.		n.s.		n.s.		n.s.
Poor			102.27		102.83		100.09		94.76	
Less Poor			101.98		100.09		98.61		92.37	
Financial Difficulty	n.a.			n.s.		n.s.		n.s.		n.s.
Yes			101.04		100.68		99.07		94.01	
No			102.18		102.21		100.48		93.31	
Parental perceived negative financial impact	n.a.			n.s.		n.s.		n.s.		n.s.
High			99.77		100.68		100.25		91.78	
Low			101.93		101.58		99.86		93.91	
Gender	n.a.			n.s.		n.s.		n.s.		n.s.
Male			102.34		101.68		99.83		95.40	
Female			101.43		101.04		99.31		92.66	
Age at initial Enrollment	n.a.		101.76 (16.77)	n.s.	101.04 (17.09)	n.s.	99.43 (19.26)	n.s.	93.63 (19.37)	n.s.

Note: p*<.05; n.s. = Non-Statistically Significance; n.a.= Data not available

Table G.3. Bivariate Analysis between Parent-child Relationship and Participants' Characteristics (PRS)

	PC Round 1 (Mean)		PC Round 2 (Mean)		PC Round 3 (Mean)		PC Round 4 (Mean)		PC Round 5 (Mean)	
Participants Characteristics	n=502	Sig.	n=562	Sig.	n=556	Sig.	n=517	Sig.	n=431	Sig.
Childhood Poverty		n.s.		n.s.		n.s.		n.s.		n.s.
Poor	50.23		50.12		48.80		45.81		45.36	
Less Poor	50.03		49.94		49.08		45.85		45.23	
Financial Difficulty		n.s.		n.s.		n.s.		n.s.		n.s.
Yes	50.73		49.79		48.99		45.75		45.17	
No	49.60		50.32		49.97		45.91		45.43	
Parental perceived negative financial impact		n.s.		n.s.		n.s.		n.s.		n.s.
High	48.71		49.58		47.96		44.00		44.38	
Low	50.36		50.32		49.10		46.10		45.56	
Gender		*		*		n.s.		*		n.s.
Male	49.19		49.02		48.00		44.64		44.75	
Female	50.77		50.59		49.00		46.53		45.63	
Age at initial Enrollment	50.11(7.61)	*	49.99(6.86)	*	48.91(6.93)	*	45.78(5.96)	*	45.29(5.18)	n.s.

Note: p*<.05; n.s. = Non-Statistically Significance

Table G.4. Bivariate Analysis between Family Network Size and Participants' Characteristics (FNS)

	FNS Round 1 (Median)		FNS Round 2 (Median)		FNS Round 3 (Median)		FNS Round 4 (Median)		FNS Round 5 (Median)	
Participants	n=521		n=569	Sig.	n=562	Sig.	n=524	Sig.	n=432	Sig.
Characteristics										
Childhood Poverty		n.s.		n.s.		n.s.		n.s.		n.s.
Poor	0		1		1		1		1	
Less Poor	0		1		1		1		1	
Financial Difficulty		n.s.		n.s.		n.s.		n.s.		n.s.
Yes	0		1		1		1		1	
No	0		1		1		1		1	
Parental perceived negative financial impact		n.s.		n.s.		n.s.		n.s.		n.s.
High	0		1		1		1		1	
Low	0		1		1		1		1	
Gender		n.s.		n.s.		n.s.		n.s.		n.s.
Male	0		1		1		1		1	
Female	0		1		1		1		1	
Age at initial Enrollment	0	*	1	*	1	*	1	n.s.	1	n.s.

Note: p*<.05; n.s.= Non-Statistically Significance

Table G.5. Bivariate Analysis between Peer Network Size and Participants' Characteristics (PNS)

	PNS Round 1 (Median)		PNS Round 2 (Median)		PNS Round 3 (Median)		PNS Round 4 (Median)		PNS Round 5 (Median)	
Participants	n=520		n=563	Sig.	n=558	Sig.	n=522	Sig.	n=430	Sig.
Characteristics										
Childhood Poverty		n.s.		n.s.		n.s.		n.s.		n.s.
Poor	0		2		2		2		2	
Less Poor	0		2		2		2		2	
Financial Difficulty		n.s.		n.s.		n.s.		n.s.		n.s.
Yes	0		2		2		2		3	
No	1		2		2		2		2	
Parental perceived negative financial impact		n.s.		n.s.		n.s.		n.s.		n.s.
High	0		3		2		2		3	
Low	0		2		2		2		2	
Gender		*		*		*		n.s.		*
Male	0		2		1		2		2	
Female	1		2		2		3		3	
Age at initial Enrollment	0	*	2	*	2	*	2	*	2	*

Note: p*<.05; n.s.= Non-Statistically Significance

Missing Data. Missing data analysis was conducted using logistic regression. The variables of mentoring relationship, parent-child relationship, family network size and peer network size for each round (i.e., Round 1 to 5 , depending on the availability of the variables) were dichotomized (i.e., missing data=1, non-missing data=0). These outcome variables were then regressed on participantsôdemographics and socio-economic backgrounds. Missingness in round 4 for all variables were associated with participantsôexperiences of financial difficulty. Those who reported having experienced financial difficulty have higher likelihoods of missing in this round. Missingness in round 5 for all variables were also associated with participantsô gender, age and family configuration (i.e., living with single parent). Males were more likely than females to drop out at the last round of data collection. Those who were older at enrollment and those living in single parent family were more likely to drop out at the last round of the study too. For details of the findings, please refer to Table G.6 to Table G.9.

Table G.6. Missing Analysis on the Variable of Mentoring relationship

	MQ (Round 2)		**MQ (Round 3)**		**MQ (Round 4)**		**MQ (Round 5)**	
Independent Variables	b	S.E.	b	S.E.	b	S.E	b	S.E.
Gender (Female=1)	-0.15	.19	0.06	0.20	-0.20	0.19	-0.57*	0.18
Age at enrollment	0.07	0.06	0.07	0.06	0.08	0.05	0.17*	0.05
Family Income Status (Receiving Social Security =1)	0.18	0.22	0.03	0.22	-0.21	0.21	0.21	0.21
Housing Type (Rented Housing =1)	-0.40	0.29	0.68	0.37	0.40	0.30	-0.20	0.29
Parental Employment Status (Unemployed =1)	-0.35	0.22	-0.11	0.23	0.10	0.21	-0.26	0.21
Parental Education Level (Low =1)	-0.24	0.21	-0.05	0.22	0.14	0.20	-0.21	0.20
Family Configuration (Single Parent=1)	0.17	0.21	0.51*	0.20	0.28	0.20	0.40*	0.19
Experienced Financial Difficulty (Yes=1)	0.41	0.21	0.24	0.21	0.55*	0.19	-0.01	0.19
Perceived Econ Pressure (Yes=1)	-0.27	0.36	0.12	0.35	-0.61	0.35	0.18	0.34

*p<.05

Table G.7. Missing Analysis on the Variable of Parent-child Relationship(PRS)

	PRS (Round 1)		PRS (Round 2)		PRS (Round 3)		PRS (Round 4)		PRS (Round 5)	
Independent Variables	b	S.E.	b	S.E.	B	S.E	b	S.E.	b	S.E.
Gender (Female=1)	-0.03	0.19	-0.30	0.22	0.01	0.22	0.02	0.20	-0.45*	0.18
Age at enrollment	0.10	0.06	0.16*	0.06	0.08	0.06	0.10	0.06	0.17*	0.05
Family Income Status (Receiving Social Security =1)	0.27	0.22	0.33	0.24	0.28	0.24	-0.18	0.22	-.13	0.21
Housing Type (Rented Housing =1)	-0.49	0.30	-0.49	0.32	0.63	0.40	0.52	0.34	-0.28	0.28
Parental Employment Status (Unemployed =1)	-0.20	0.22	-0.33	0.24	-0.45	0.24	0.16	0.27	-0.15	0.21
Parental Education Level (Low =1)	0.22	0.21	-0.06	0.23	-0.05	0.24	0.26	0.21	-0.10	0.20
Family Configuration (Single Parent=1)	-0.01	0.21	0.21	0.23	0.38	0.23	0.41	0.21	0.48*	0.19
Experienced Financial Difficulty (Yes=1)	-0.31	0.21	0.50*	0.23	0.08	0.23	0.48*	0.21	-0.00	0.20
Perceived financial impact (Yes=1)	0.70*	0.34	-0.36	0.40	-0.01	0.40	-0.51	0.37	0.10	0.34

*p<.05

Table G.8. Missing Analysis on the Variable of Family Network Size (FNS)

	FNS (Round 1)		FNS (Round 2)		FNS (Round 3)		FNS (Round 4)		FNS (Round 5)	
Independent Variables	b	S.E.	b	S.E.	B	S.E	b	S.E.	b	S.E.
Gender (Female=1)	-0.14	0.20	-0.27	0.22	0.03	0.22	0.12	0.20	-0.52	0.19
Age at enrollment	0.13*	0.06	0.14*	0.06	0.09	0.07	0.08	0.06	0.18	0.05
Family Income Status (Receiving Social Security =1)	0.08	0.23	0.16	0.24	0.28	0.25	-0.24	0.22	0.15	0.21
Housing Type (Rented Housing =1)	0.23	0.31	-0.51	0.32	0.56	0.41	0.43	0.33	-0.22	0.29
Parental Employment Status (Unemployed =1)	-0.04	0.23	-0.21	0.24	-0.41	0.25	0.21	0.23	-0.12	0.21
Parental Education Level (Low =1)	0.11	0.21	-0.06	0.23	-0.10	0.24	0.27	0.21	-0.17	0.21
Family Configuration (Single Parent=1)	-0.00	0.21	0.37	0.23	0.46	0.23	0.37	0.21	0.47	0.20
Experienced Financial Difficulty (Yes=1)	-0.29	0.22	0.43	0.23	0.09	0.23	0.50	0.21	-0.09	0.19
Perceived financial impact (Yes=1)	0.75	0.35	-0.19	0.39	0.01	0.40	-0.50*	0.37	0.14	0.34

*p<.05

Table G.9. Missing Analysis on the Variable of Peer Network Size (PNS)

	PNS (Round 1)		PNS (Round 2)		PNS (Round 3)		PNS (Round 4)		PNS (Round 5)	
Independent Variables	b	S.E.	b	S.E.	B	S.E	b	S.E.	b	S.E.
Gender (Female=1)	-0.16	0.20	-0.30	0.21	0.02	0.22	0.12	0.20	-0.48*	0.18
Age at enrollment	0.13	0.06	0.12	0.06	0.07	0.06	0.08	0.06	0.16*	0.05
Family Income Status (Receiving Social Security =1)	0.05	0.22	0.29	0.24	0.27	0.24	-0.28	0.22	0.13	0.21
Housing Type (Rented Housing =1)	-0.22	0.30	-0.52	0.31	0.46	0.29	0.44	0.33	-0.26	0.28
Parental Employment Status (Unemployed =1)	-0.02	0.23	-0.18	0.24	-0.33	0.24	0.22	0.23	-0.08	0.21
Parental Education Level (Low =1)	0.10	0.21	0.01	0.23	-0.12	0.24	0.22	0.21	-0.20	0.20
Family Configuration (Single Parent=1)	0.03	0.22	0.34	0.22	0.37	0.22	0.34	0.21	0.43	0.19
Experienced Financial Difficulty (Yes=1)	-0.26	0.22	0.31	0.22	0.10	0.23	0.50*	0.21	-0.09	0.20
Perceived financial impact (Yes=1)	0.72	0.35	-0.18	0.39	-0.04	0.39	-0.49	0.37	0.12*	0.34

*p<.05

Exploratory Data Analysis

Bivariate analysis. Correlation analysis was used to test the strength of association between **(1)** psychological health, mentoring relationship and parent-child relationship, **(2)** psychological health and peers and family network size, and **(3)** Mentoring relationship and peers and family network size. Findings of these correlation analyses offered guiding information for the model building procedures in subsequent analysis. For details on the rationale and plan for analyses please refer to Section 3.6.2 in this dissertation.

Table G.10. to Table G.12. are results of the person correlation analysis between psychological health, parent-child relationship and mentoring relationship for Round 3, 4 and 5. Bronferroni correction was used to counteract the problem of multiple comparisons. Results of the correlation analyses suggested that parent child relationships and mentoring relationship were associated with positive psychological health. In general, the association between psychological health and parent-child relationship, and mentoring relationship and parent-child relationship were moderate for round 3 and round 5. The relationship between mentoring relationship and psychological health was weak for round 3 and 5. For round 4, the associations between parent-child relationship and psychological health, and parent-child relationship and mentoring relationship were weak. There was no association between mentoring relationship and psychological health in round 4.

Table G.10. Correlation Matrix of Psychological Health, Parent-child Relationship and Mentoring relationship (Round 3)

	Psychological Health	Parent-child Relationship	Mentoring Relationship
Psychological Health	1.00		
Parent-child Relationship	0.35*	1.00	
Mentoring Relationship	0.17*	0.30*	1.00

*p<.05

Table G.11. Correlation Matrix of Psychological Health, Parent-child Relationship and Mentoring relationship (Round 4)

	Psychological Health	Parent-child Relationship	Mentoring Relationship
Psychological Health	1.00		
Parent-child Relationship	0.15*	1.00	
Mentoring Relationship	0.08	0.20*	1.00

*p<.05

Table G.12. Correlation Matrix of Psychological Health, Parent-child Relationship and Mentoring relationship (Round 5)

	Psychological Health	Parent-child Relationship	Mentoring Relationship
Psychological Health	1.00		
Parent-child Relationship	0.32*	1.00	
Mentoring Relationship	0.14*	0.22*	1.00

*p<.05

Table G.13 to Table G.15 present results of the spearman correlation analysis between psychological health, family network size and peer network size for Round 3, 4 and 5. Bronferroni correction was used to counteract the problem of multiple comparisons. On the contrary to predictions, only family network size was associated with psychological health for all rounds of data. For round 3, peer network size was positively associated with family network size. For round 4 and 5, none of the variables measuring social network size was statistically related.

Table G.13. Correlation Matrix of Psychological Health, Family and Peers Network Size (Round 3)

	Psychological Health	Family Network Size	Peer Network Size
Psychological Health	1.00		
Family Network	0.19*	1.00	
Peer Network	-0.00	-0.12*	1.00

*p<.05

Table G.14. Correlation Matrix of Psychological Health, Family and Peers (Round 4)

	Psychological Health	Family Network Size	Peer Network Size
Psychological Health	1.00		
Family Network	0.13*	1.00	
Peer Network	-0.00	-0.02	1.00

*p<.05

Table G.15. Correlation Matrix of Psychological Health, Family and Peers (Round 5)

	Psychological Health	Family Network Size	Peer Network Size
Psychological Health	1.00		
Family Network	0.25*	1.00	
Peer Network	0.05	-0.04	1.00

*p<.05

Table G.16 to Table G.18 present results of the spearman correlation between mentoring relationship, family network size and peer network size for Round 3, 4 and 5. Bronferroni correction was used to counteract the problem of multiple comparisons. Results showed that mentoring relationship was not associated with peer and family network size.

Table G.16. Correlation Matrix of Psychological Health, Family and Peers Network Size (Round 3)

	Mentoring relationship	Family Network Size	Peer Network Size
Mentoring relationship	1.00		
Family Network	0.06	1.00	
Peer Network	0.02	-0.12*	1.00

*p<.05

Table G.17. Correlation Matrix of Psychological Health, Family and Peers Network Size (Round 4)

	Mentoring relationship	Family Network Size	Peer Network Size
Mentoring relationship	1.00		
Family Network	0.07	1.00	
Peer Network	0.05	-0.02	1.00

*p<.05

Table G.18. Correlation Matrix of Psychological Health, Family and Peers Network Size (Round 5)

	Mentoring relationship	Family Network Size	Peer Network Size
Mentoring relationship	1.00		
Family Network	-0.02	1.00	
Peer Network	-0.03	0.05	1.00

*p<.05

Need for Multilevel Model with Psychological Health (Round 3 to 5) as Outcome.

Intraclass correlation was calculated using information from the null model (See Table G.19). Information on the random effects was used to calculate value of the intraclass correlation coefficient (ICC). Value of the intraclass correlation coefficient (ICC) based on the null model (Model 4.7) showed that approximately 36% of the variance in psychological health was accounted for by each individual (i.e., 9.24/9.24+16.77). The moderately high ICC value suggested that a multilevel model.

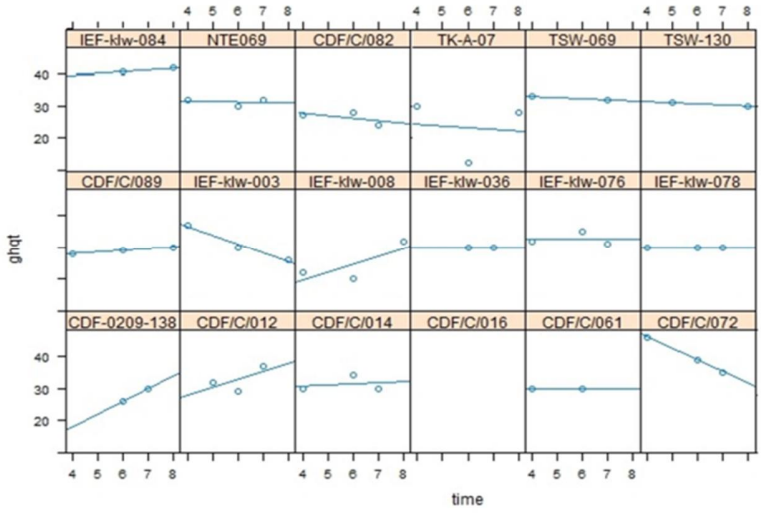
Table G.19. Multilevel models of Psychological Health on Time

	Model 4.7 (Null Model)			Model 4.8 (Unconditional Linear Growth Model: Intercept-varying)			Model 4.9 (Unconditional Linear Growth Model: Slope-varying)		
Fixed Effects	**b**	**S.E.**	**t**	**b**	**S.E.**	**T**	**b**	**S.E.**	**t**
Intercept	30.53*	0.15	191.4	31.88*	0.56	57.15	31.91*	0.55	57.59
Time				-0.23*	0.09	-2.52	-0.24*	0.10	-2.45
Random Effects	**σ^2**	**Std. Dev**		**σ^2**	**Std. Dev**		**σ^2**	**Std. Dev**	
Intercept (Participants)	9.24	3.03		9.20			0.00	0.00	
Slope (Time)							0.20	0.40	
Residual	16.08	4.01		16.03	4.00		16.60		
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**		**-2LL**	**AIC**	
	-4465	8935		-4463	8934		-4470	8952	
				χ^2	**df**				
Comparison of Model 0 to Model 1				6.36*	1				
Comparison of Model 1 to Model 2				0.00	2				

*p<.05

Figure G.1 is an illustration of the plots of psychological health against time of 18 randomly sampled participants. The variation in the intercepts and relationships between time and psychological health among the participants suggests that multilevel modeling is needed.

Figure G.1. Plots of Psychological Health and Time of 18 Randomly Sampled Participants



Intercept varying or slope varying model. Referring to Table G.19, results of model comparison suggest that the intercept-varying model was better than the null model (χ^2=6.36, df=1, p<0.05), but the slope-varying model did not show a better fit (χ^2=0.00, df=2, p>0.05). Empirical evidence suggested that subsequent models should be established based on the intercept-varying model.

Need for Multilevel Model with Parent-child Relationship(Round 3 to 5) as Outcome. Intraclass correlation was calculated using information from the null model (See Table G.20). Information on the random effects was used to calculate value of the intraclass correlation coefficient (ICC). Value of the intraclass correlation coefficient (ICC) based on the null model (Model 4.10) showed that approximately 48% of the variance in general psychological health was accounted for by each individual (i.e., 20.36/21.71+20.36). The high ICC value suggested that a multilevel model incorporating individual characteristics might be useful.

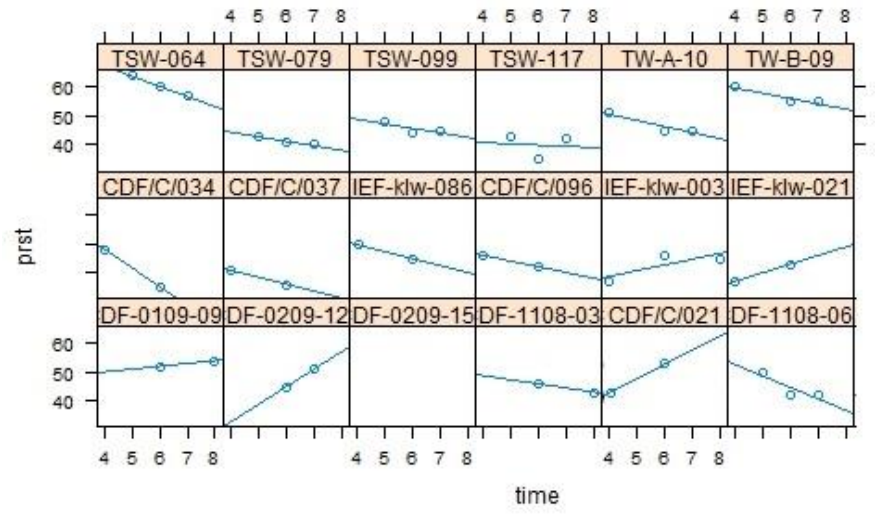
Table G.20. Multilevel models of Parent-child Relationship and Time

	Model 4.10 (Null Model)			**Model 4.11 (Unconditional Linear Growth Model: Intercept-varying)**			**Model 4.12 (Unconditional Linear Growth Model: Slope-varying)**		
	b	**S.E.**	**t**	**b**	**S.E.**	**t**	**b**	**S.E.**	**t**
Fixed Effects									
Intercept	46.70*	0.21	216.8	54.33*	0.61	88.67	54.26*	0.67	81.99
Time				-1.33*	0.09	-13.33	-1.31*	0.10	-12.83
Random Effects	**σ^2**	**Std. Dev**		**σ^2**	**Std. Dev**		**σ^2**	**Std. Dev**	
Intercept (Participants)	20.36	4.51		22.05	4.69		69.18	8.31	
Slope (Time)							0.62	0.78	
Residual	21.71	4.66		17.96	4.23		16.65	4.08	
Model Fit	**-2LL**	**AIC**		**-2LL**	**AIC**		**-2LL**	**AIC**	
	-4799	9605		-4720	9448		-4709	9431	
					χ^2	**df**			
Comparison of Model 4.11 and Model 4.10					161.64*	1			
Comparison of Model 4.12 to Model 4.11					20.87*	2			

*p<.05

Figure G.2 is an illustration of the plots of parent-child relationship against time of 18 randomly sampled participants. The variation in the intercepts and the slope between time and parent-child relationship among the participants suggests that multilevel modeling is needed.

Figure G.2. Plots of Parent-child Relationship and Time of 18 Randomly Sampled Participants



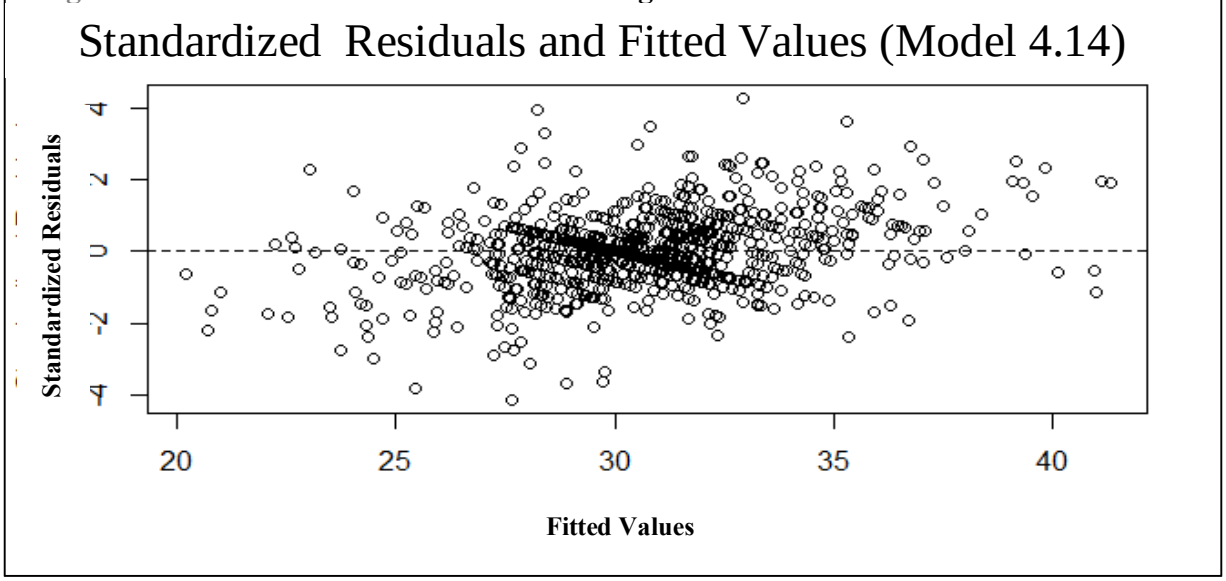
Intercept varying or slope varying model. Referring back to Table G.20, results of model comparison suggest that the intercept varying model was better than the null model (χ^2=161.64, df=1, p<0.05), and the slope varying model also showed a better fit than the intercept varying model (χ^2=20.87, df=2, p<0.05). Empirical evidence suggested that the subsequent model should be established based on the slope-varying model.

Model Validation

Model Diagnostics: Model 4.14. Model diagnostic procedures were taken to examine whether the assumptions of regression were fulfilled in the multilevel model of 4.14. Three steps were taken to check for (1) the problem of constant error variance and correlated residuals; (2) non- normal distribution of residuals; and (3) existence of outliers and influential data (Fox, 1991).

1) **Problem of constant error variance and correlated residuals.** Figure G.3 illustrates the plot of the residuals of each observation against its fitted values, which was used to examine the existence of the problem of constant error variance and correlated residuals. The observations tended to be randomly scattered in the plot, suggesting that there were no systematic error in the regression.

Figure G.3. Plot of Standardized Residuals Against Fitted Values



2) **Problem of non-normal distribution of error.** To examine the normality of residuals, a histogram and a QQ-plot of the residuals were generated (Figure G.4 & Figure G.5). The histogram (Figure G.4) showed that the residuals tended to be normally distributed.

The QQ-plot (Figure G.5) had two heavy tails suggesting the existence of outliers at both end of the distribution. A closer look at the outliers showed that 52 residuals had standardized residual values larger +2.5 and 1 observation smaller than -2.5.

Figure G.4. Histogram of Standardized Residuals

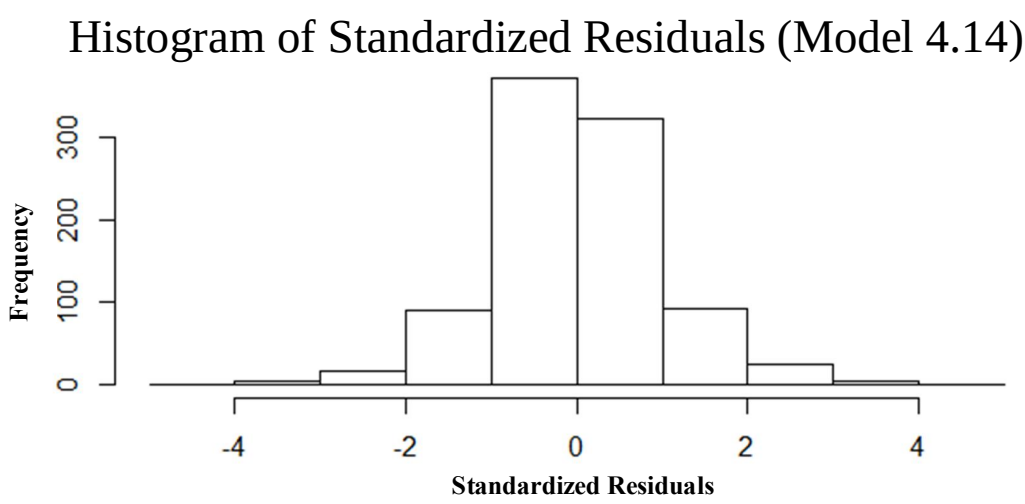
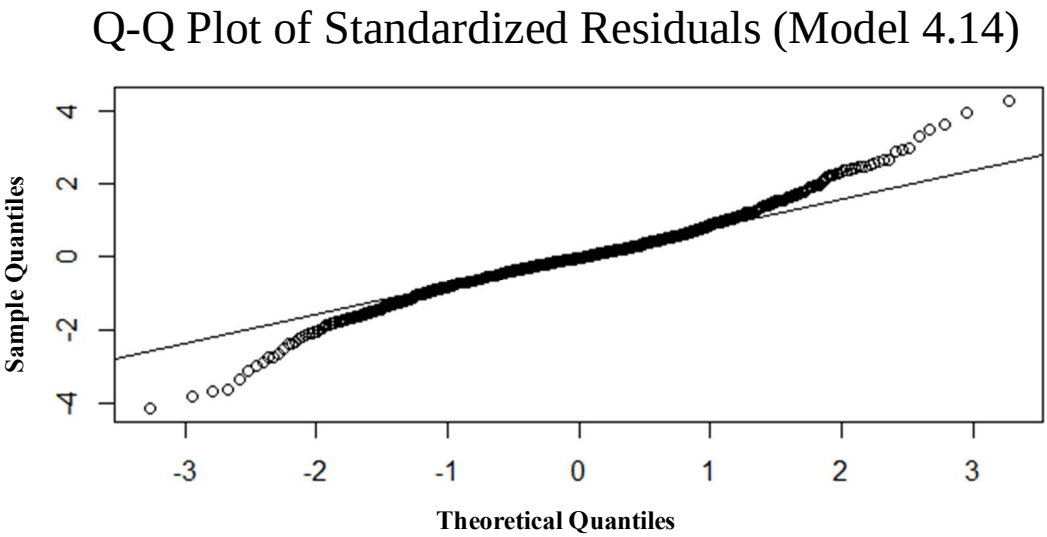


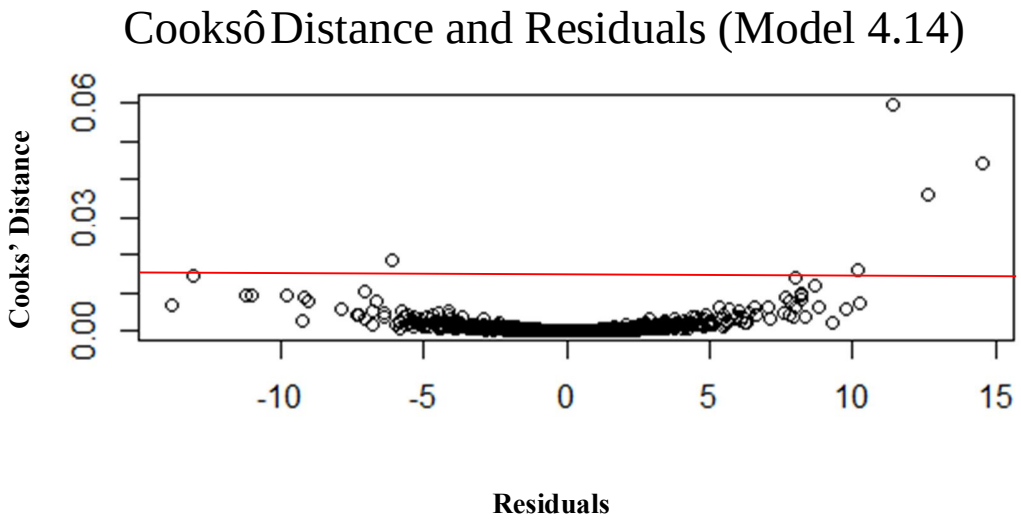
Figure G.5. Q-Q plot of Standardized Residuals



T

To further identify outliers and influential points, the cooksô distance of each observation were calculated and plotted against the residuals (Figure G.6). According to the plot, most data points had cooks distance value clustering below 0.01. Data points with cooksô distance sustainably larger than the rest tended to have value large than 0.01. As such, the cutoff point of 0.01 as used to determine influential data point (Fox, 1991).

Figure G.6. Plot of Cooks' Distance Against Residuals



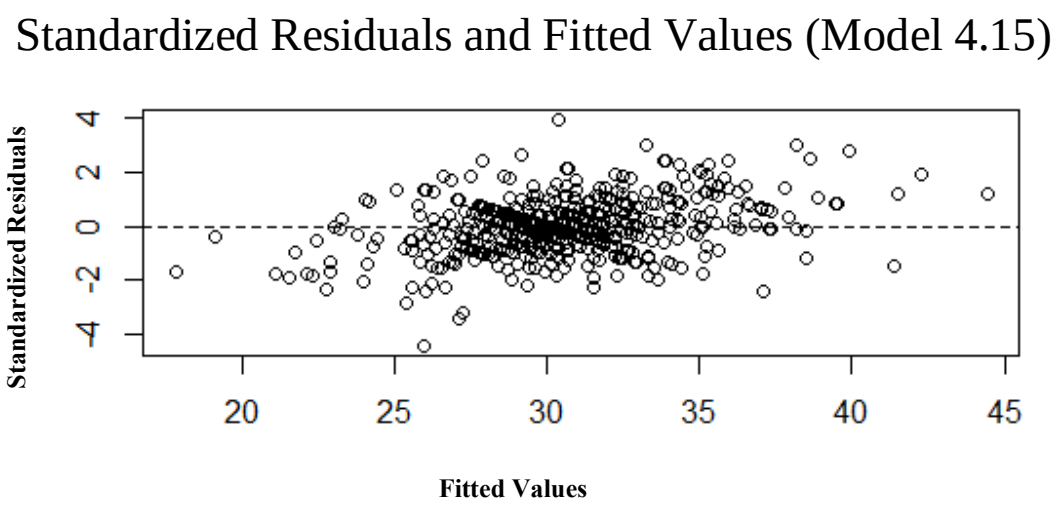
A closer examination showed that out of the 53 outliers identified in the previous step, 21 of them also had cooksô distance values larger than 0.01. Data points with a combination of high leverage with an outlier suggested that they tended to have high influence on the regression coefficients (Fox, 1991). An examination on these data points showed that they were not problematic, therefore, all data points were retained.

Model Diagnostics: Model 4.15. Model diagnostic procedures were taken to examine whether the assumptions of regression were fulfilled in the multilevel model of 4.15. Three steps were taken to check for (1) the problem of constant error variance and correlated residuals; (2) non- normal distribution of residuals; and (3) existence of outliers and influential data (Fox, 1991).

1) Problem of constant error variance and correlated residuals

Figure G.7 illustrates the plot of the residuals of each observation against its fitted values, which was used to examine the existence of the problem of constant error variance and correlated residuals. The observations tended to be randomly scattered in the plot, suggesting that there were no systematic error in the regression.

Figure G.7. Plot of Residuals Against Fitted Values



2) Problem of non-normal distribution of error

To examine the normality of residuals, a histogram and a QQ-plot of the residuals were generated (Figure G.8 & Figure G.9). The histogram (Figure G.8) shows that the residuals

tended to be normally distributed. The QQ-plot (Figure G.9) has two heavy tails suggesting the existence of outliers at both end of the distribution. A closer look at the outliers showed that 34 residuals had standardized residual values larger +2.5 and 1 observation smaller than -2.5.

Figure G.8. Histogram of Standardized Residuals

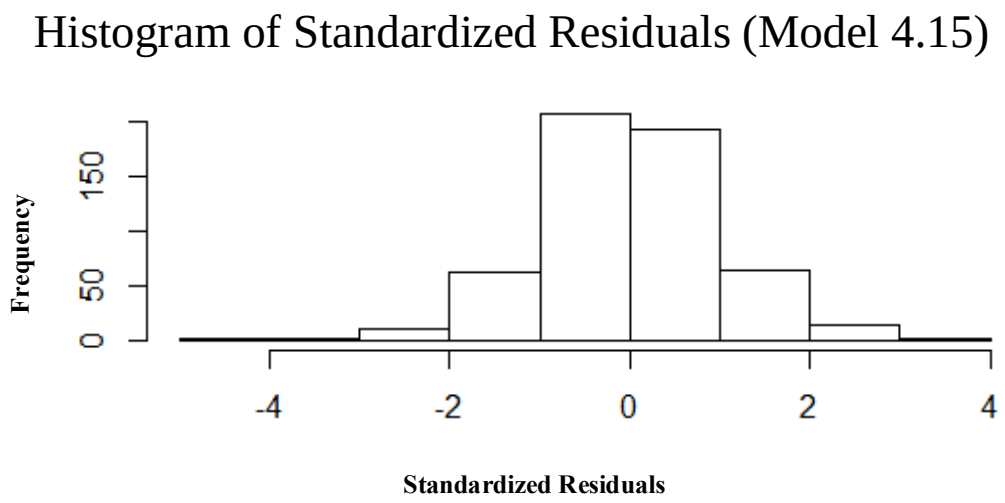
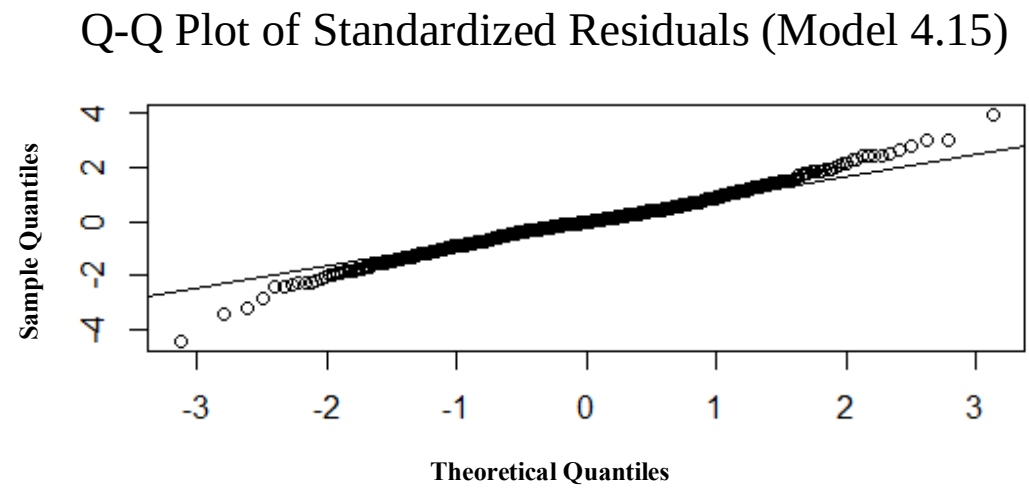
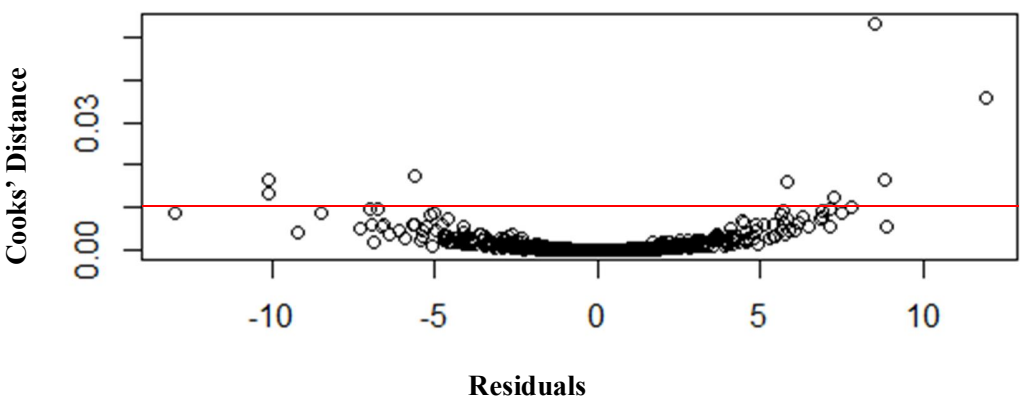


Figure G.9. Q-Q plot of Standardized Residuals



To further identify outliers and influential points, the cooksô distance for each observations were calculated and plotted against the residuals (Figure G.10). According to the plot, most data points had cooksô distance value clustering below 0.01. Data points with cooks distance sustainably larger than the rest tended to have value large than 0.01. As such, the cutoff point of 0.01 was used to determine influential data point (Fox, 1991).

Figure G.10. Plots of Cooks Distance Against Residuals



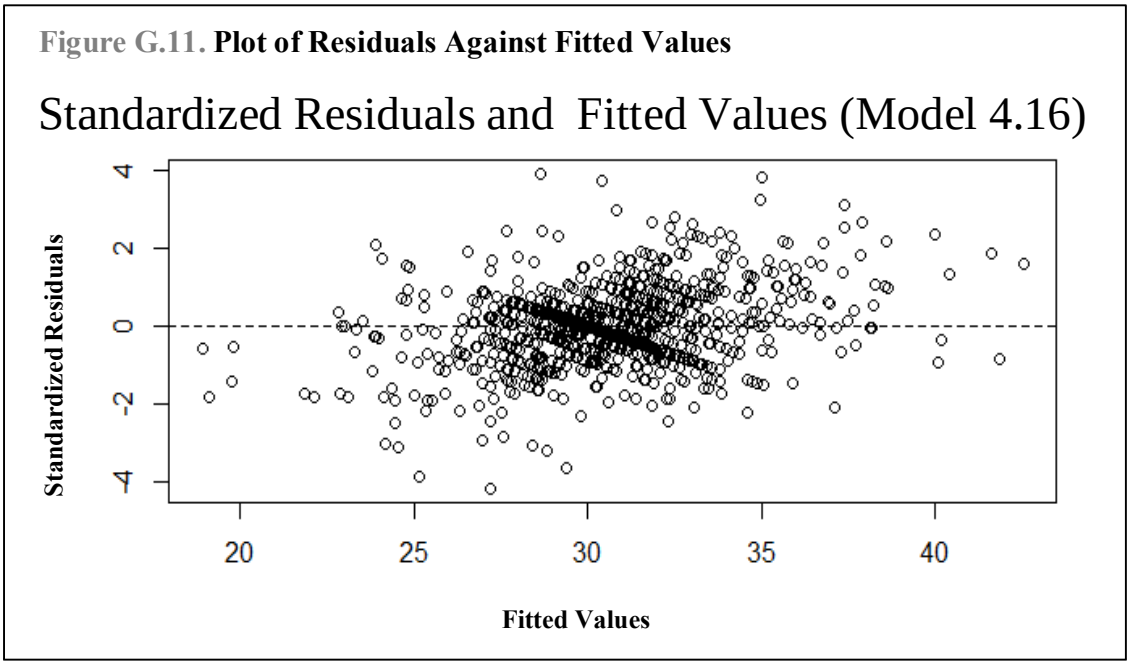
A closer examination showed that out of the 41 outliers identified in the previous step, 18 of them also had cooksô distance values larger than 0.01. Data points with combination of high leverage with an outlier suggested that they tended to have high influence on the regression coefficients (Fox, 1991). An examination on these data points showed that they were not problematic, therefore, all data points were retained.

Model Diagnostics: Model 4.16. Model diagnostic procedures were taken to examine whether the assumptions of regression were fulfilled in the multilevel model of 4.16. Three steps were taken to check for (1) the problem of constant error variance and correlated residuals; (2) non- normal distribution of residuals; and (3) existence of outliers and influential data (Fox, 1991).

1) Problem of constant error variance and correlated residuals

Figure G.11 illustrates the plot of the residuals of each observation against its fitted values, which was used to examine the existence of the problem of constant error variance and correlated residuals. The observations tended to be randomly scattered in the plot, suggesting that there were no systematic error in the regression.

Figure G.11. Plot of Residuals Against Fitted Values



2) Problem of non-normal distribution of error

To examine the normality of residuals, a histogram and a QQ-plot of the residuals were generated (Figure G.11 & Figure G.12). The histogram (Figure G.11) shows that the residuals

tended to be normally distributed. The QQ-plot (Figure G.12) has two heavy tails suggesting the existence of outliers at both end of the distribution. A closer look at the outliers showed that 57 residuals had standardized residual values larger +2.5 and 1 observation smaller than -2.5.

Figure G.11. Histogram of Standardized Residuals

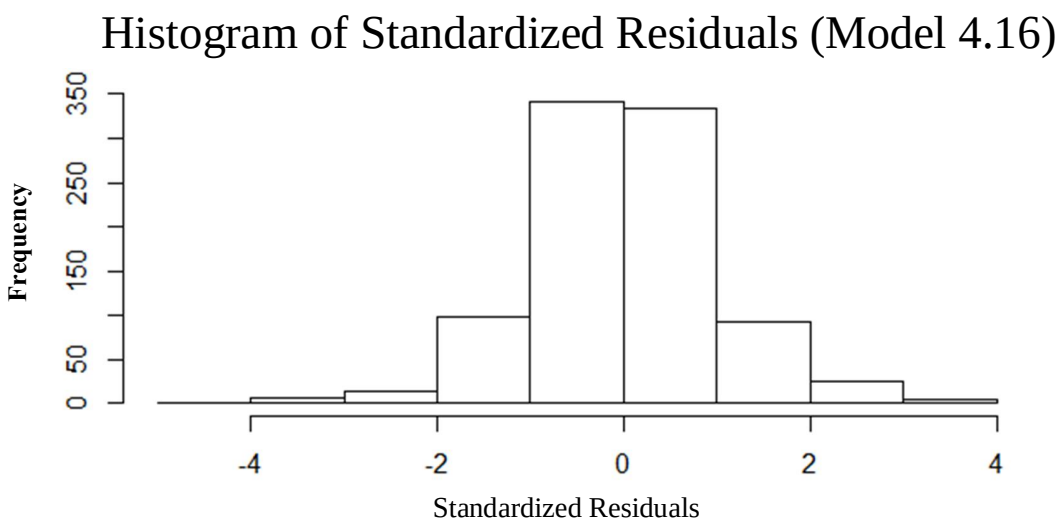
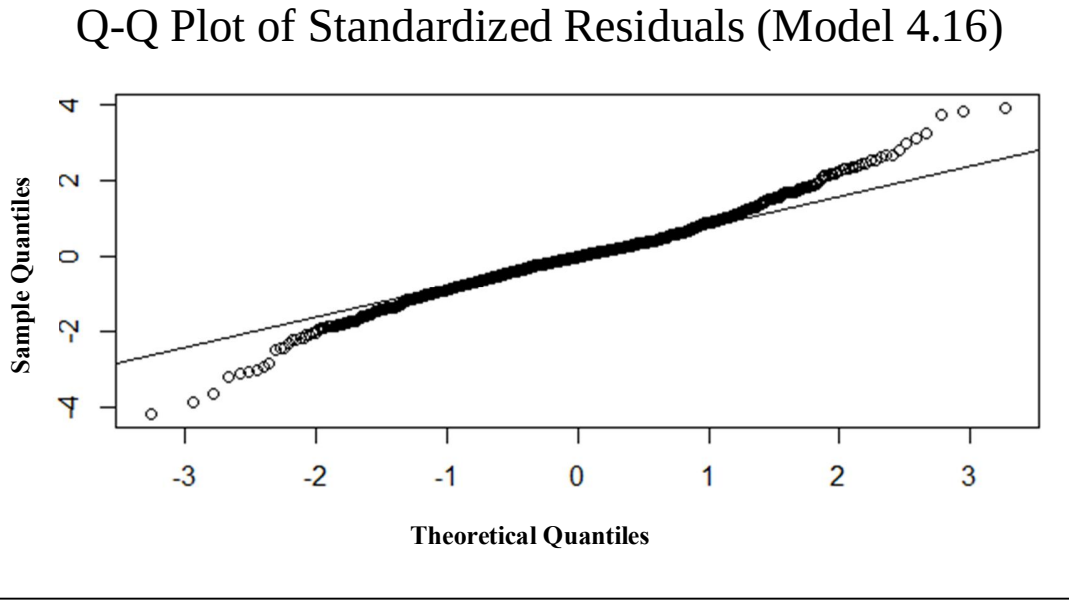
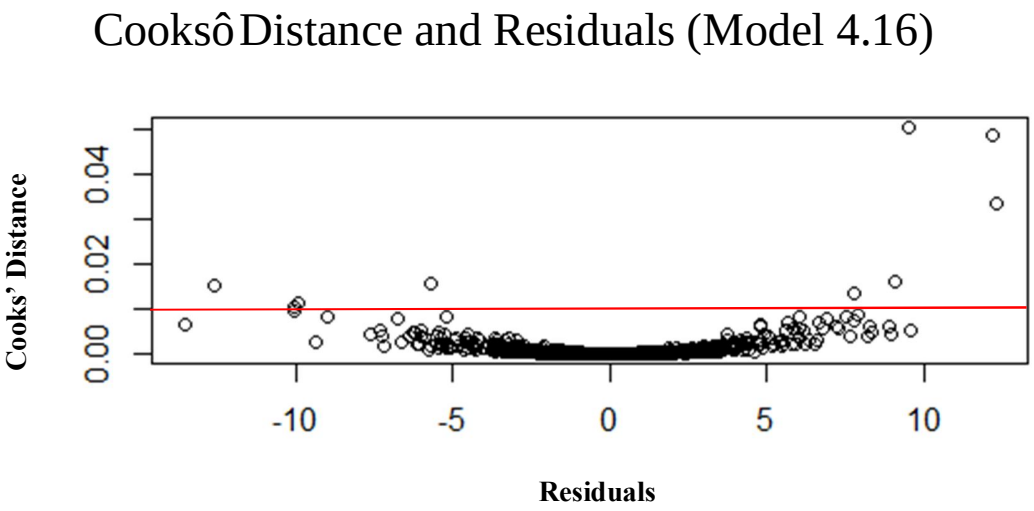


Figure G.12. Q-Q Plot of Standardized Residuals



To further identify outliers and influential points, the cooksô distance for each observations were calculated and plotted against the residuals (Figure G.13). According to the plot, most data points had cooksô distance value clustering below 0.01. Data points with cooks distance sustainably larger than the rest tended to have value large than 0.01. As such, the cutoff point of 0.01 as used to determine influential data point (Fox, 1991).

Figure G.13. Plot of Cooks' Distance Against Residuals



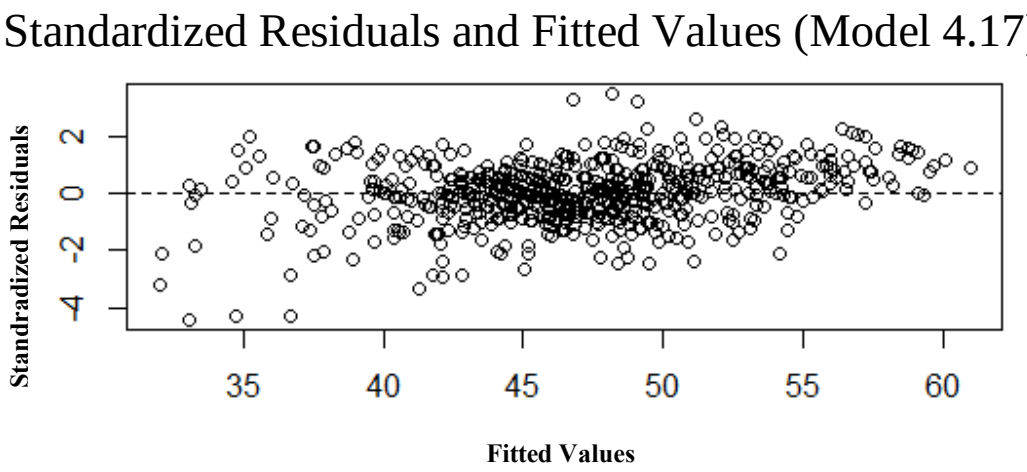
A closer examination showed that out of the 58 outliers identified in the previous step, 19 of them also had cooksô distance values larger than 0.01. Data points with a combination of high leverage with an outlier suggested that they tended to have high influence on the regression coefficients (Fox, 1991). An examination on these data points showed that they were not problematic, therefore, all data points were retained.

Model Diagnostics: Model 4.17. Model diagnostic procedures were taken to examine whether the assumptions of regression were fulfilled in the multilevel model of 4.17. Three steps were taken to check for (1) the problem of constant error variance and correlated residuals; (2) non- normal distribution of residuals; and (3) existence of outliers and influential data (Fox, 1991).

1) Problem of constant error and correlated residuals

Figure G.14 illustrates the plot of the residuals of each observation against its fitted values, which was used to examine the existence of the problem of constant error variance and correlated residuals. The observations tended to be randomly scattered in the plot, suggesting that there were no systematic error in the regression.

Figure G.14. Plot of Residuals Against Fitted Values



2) Problem of non-normal distribution of error

To examine the normality of residuals, a histogram and a QQ-plot of the residuals were generated (Figure G.15 & Figure G.16). The histogram ((Figure G.15) shows that the residuals tended to be normally distributed. The QQ-plot (Figure G.16) has two heavy tails suggesting the

existence of outliers at both end of the distribution. A closer look at the outliers showed that 24 residuals had standardized residual values larger +2.5 and 1 observation smaller than -2.5.

Figure G.15. **Histogram of Standardized Residuals**

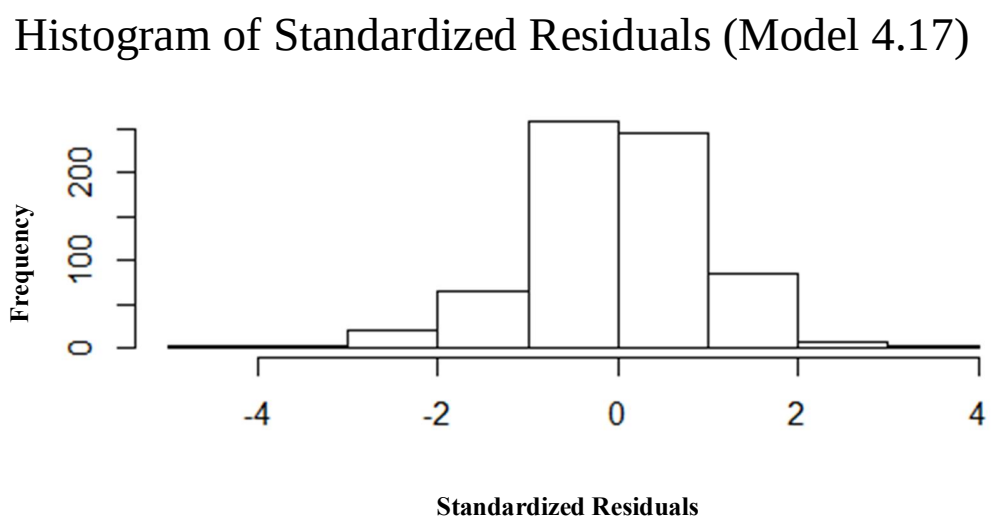
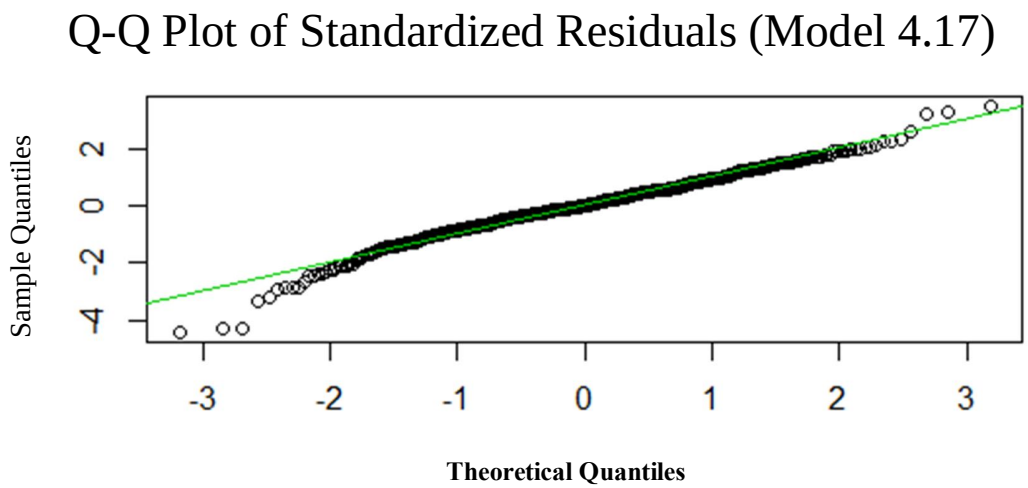
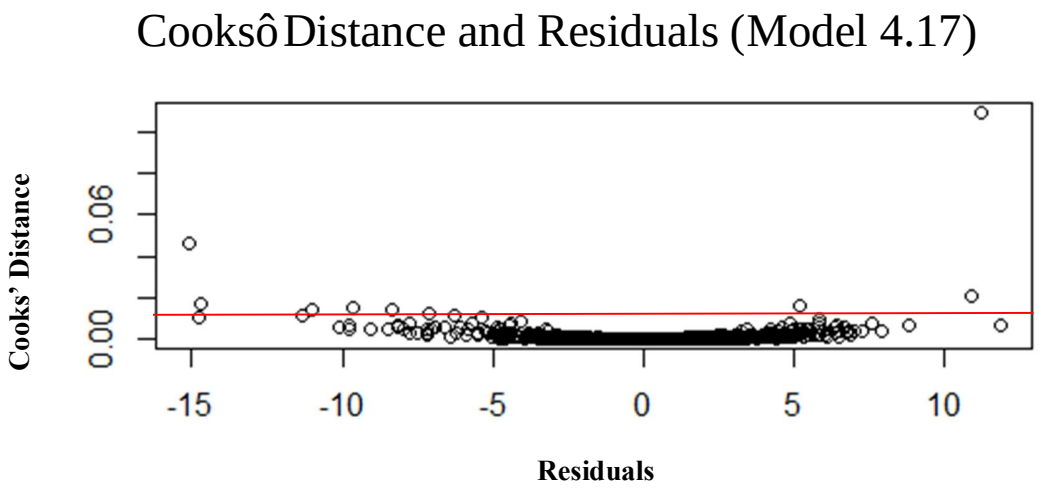


Figure G.16. **Q-Q Plot of Standardized Residuals**



To further identify outliers and influential points, the cooksô distance were calculated and plotted against the residuals (Figure G.17). According to the plot, most data points had cooks distance value clustering below 0.01. Data points with cooksô distance sustainably larger than the rest tended to have value large than 0.01. As such, the cutoff point of 0.01 was used to determine influential data point (Fox, 1991).

Figure G.17. Plot of Cooks' Distance Against Residuals



A closer examination showed that out of the 25 outliers identified in the previous step, 12 of them also had cooksô distance values larger than 0.01. Data points with combination of high leverage with an outlier suggested that they tended to have high influence on the regression coefficients (Fox, 1991). An examination on these data points showed that they were not problematic, therefore, all data points were retained.

Data Missingness and Effect of Mentoring relationship on Psychological Health.

Table G.21. presents this interaction effect model. Findings showed that none of the interaction effect was statistically significant, except for the one between having experienced financial difficulty and mentoring relationship. However, considering that the main effect of mentoring relationship was not statistically significant, the interaction effect had little value. As such, it could be concluded that the missingness in the data set did not create different results between youths with better versus poorer socio-economic background, between male and female participants, and between older and younger people.

Table G.21. Multilevel Model Estimates of Psychological Health

Fixed Effects	**b**	**S.E.**	**t**
Intercept	24.51*	8.71	2.81
Time	-0.27*	0.13	-2.08
Mentee Gender (Female=1)	1.93	2.19	0.88
MenteeAge	-0.72	0.53	-1.34
Childhood Poverty (1=Poor)	0.17	2.09	0.08
Having Experienced Financial Difficulty (1=Yes)	5.50	2.23	2.46
Parental perceived economic pressure	-8.32	3.97	-2.09
Mentoring relationship	0.00	0.08	0.06
Psychological Health (Baseline)	0.33	0.04	8.09
Mentoring relationship (Baseline)	-0.00	0.01	-0.34
Mentoring x Gender	-0.02	0.02	-1.21
Mentoring x Age	0.00	0.00	0.99
Mentoring x Childhood Poverty	0.00	0.02	0.05
Mentoring x Financial Difficulty	-0.05*	0.02	-2.39
Mentoring x Parental Perceived Economic Pressure	-0.07	0.03	1.88
	σ^2		
Random Effects	7.89		
Intercept (Individual)	14.72		
Residual			
Model Fit	**-2LL**	**AIC**	
	-2080	4194	

*p<0.05

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