

**Gratitude and Indebtedness: Exploring Their Relationships at Dispositional and
Situational Levels among Chinese Young Adolescents in Hong Kong**

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A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
in
Education

The Chinese University of Hong Kong

August 2010

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Abstract

This study consisted of one survey study (Study 1) and two experimental studies (Study 2a and Study 2b). Study 1 aimed to examine whether gratitude and indebtedness could be empirically distinguished as two dispositional traits and how they were differentially related to subjective well-being and helping tendencies. Study 2a and Study 2b aimed to investigate whether gratitude and indebtedness could be differentiated as different emotions in specific situations and how gratitude and indebtedness as traits and emotions affected prosocial motivation and reciprocal behaviors.

In Study 1, 381 students (Sample A) aged 9 to 15 responded to Gratitude and Indebtedness Questionnaire-12 (GIQ-12) developed on the basis of Gratitude Questionnaire-6 (McCullough, Emmons & Tsang, 2002). Their responses were used to assess whether gratitude and indebtedness were perceived as distinct dispositions through exploratory factor analysis. The responses of 249 students (Sample B) with the same age range were used to confirm the factor structure derived from the exploratory factor analysis. The construct validity of gratitude and indebtedness was further examined through relating them to subjective well-being and helping tendencies.

In the two experimental studies, separate groups of 123 and 126 students from Sample B responded to questions based on vignettes designed to elicit feelings of gratitude and indebtedness. In Study 2a, three conditions of benefactor expectation for repayment (No-expectation, Expectation, and Ambiguous) were manipulated. In

Study 2b, three conditions of locus of help initiation (Request, Offer, and Ambiguous) were manipulated.

The results of Study 1 revealed that gratitude and indebtedness were perceived to be distinct among Chinese young adolescents in Hong Kong. Grateful students, compared with their less grateful counterparts, reported heightened subjective well-being, demonstrated by higher level of life satisfaction, more positive affect but less negative affect experienced in their lives. However, indebted students, compared with less indebted students, reported less satisfaction with life and more negative affect. In predicting helping tendencies, gratitude trait was found to be the strongest predictor but indebtedness trait significantly contributed to less helping tendencies.

The major findings of Study 2a and Study 2b provided general support that feelings of gratitude and indebtedness could be differentiated at the situational level. In Study 2a, different conditions of benefactor's expectation to return were found to be a key factor in differentiating *feeling thankful*, *owing others*, and *obliged to repay*. Students felt more *thankful* than *obliged to repay* when not being expected to repay; but they felt more *obliged to repay* than *thankful* when being expected for repayment. In Study 2b, different conditions of help initiation were not able to contribute to the differentiation. In predicting prosocial motivation, gratitude trait was consistently found to be a significant predictor under nearly all scenarios in Study 2a and Study 2b. However, in predicting the magnitude of reciprocation, traits and emotions of gratitude and indebtedness were found to be substantially weak predictors. Gratitude trait was found to be the only significant predictor for prosocial motivation under ambiguous conditions. The implications of the present findings for moral education

and developing interventions to promote gratitude and well-being among children and adolescents are discussed.

論文摘要

本研究包括一項問卷研究（研究一）和兩項實驗研究（研究二甲和二乙）。研究一旨在測查感恩和虧欠是否可區分為兩個特質傾向，及二者分別與主觀幸福感和助人傾向有何不同聯繫。研究二甲和二乙旨在測查在特定情境下感恩和虧欠是否可區分為不同的情感反應，以及二者作為特質傾向和情感反應如何影響親社會動機和回報行為。

在研究一中，感恩虧欠量表-12 基於感恩量表-6 (Gratitude Questionnaire-6; McCullough, Emmons, & Tsang, 2002) 編制，用於測量感恩和虧欠是否被視為不同的特質傾向。381 位 9 至 15 歲香港學生（樣本一）的數據用來進行探索性因子分析，249 位同齡學生（樣本二）的數據用來驗證由探索性因子分析得出的因子結構。感恩和虧欠的構念效度由二者與主觀幸福感和助人傾向的聯繫進一步測查。

實驗研究利用情境描述引發感恩和虧欠的情感反應。樣本二中 123 人和 126 人分別參與研究二甲和二乙。研究二甲針對助人者是否期待回報進行了三種實驗處理（不期望回報、期望回報、模糊情境）；研究二乙針對助人行為的引發進行了三種實驗處理（受助者要求、助人者提供、模糊情境）。

研究一結果顯示，香港低齡青少年視感恩與虧欠為兩個不同的特質傾向。高感恩特質學生與低感恩特質學生相比，報告了高度的主觀幸福感，表現為生活滿意度高，在生活中經歷更多正性情感和較少負性情感。然而，高虧欠特質學生與低虧欠特質學生相比，報告他們對生活較不滿意，且經歷更多負性情感。就助人傾向而言，感恩特質是最重要的預測變數，而虧欠特質則顯著地反向預測了助人傾向。

研究二甲和二乙的主要結果基本支持感恩和虧欠可區分為不同情感反應的假設。研究二甲結果顯示，助人者是否期待回報能區分受助者感恩和虧欠的感受。當不被期望回報時，學生更多覺得“感謝”，較少覺得“有必要回報”；當得知被期望回報時，學生更多覺得“有必要回報”，較少覺得“感謝”。研究二乙顯示助人行為的引發未能幫助區分。研究涉及的幾乎全部情境一致發現感恩特質能顯著預測親社會動機。但是感恩和虧欠作為特質傾向和情感反應在預測回報數量方面明顯較弱。在模糊情境中，僅感恩特質能預測親社會動機。本研究也討論了以上結果對道德教育和提升兒童青少年福祉的啟示。

Acknowledgements

My deep gratitude goes to those who supported and sustained me through the recent four-year period, one of the most challenging stages in my life:

Prof. David W. Chan, for his great patience and kindness, his constructive supervision and unreserved guidance, his demonstration of a joy for living a “consume less yet produce more” way of life, his constant positive perspectives in viewing things, and his extraordinary persistence in learning Putonghua;

Prof. Wanchi Wong, for her enlightening advice, her uplifting remarks and photographs, her in-depth discussions with me, and her demonstration of how to live a life with both excitement and commitment;

Prof. Patrick S. Y. Lau, for being considerate and generous, and for his valuable suggestions, warm encouragement, and support throughout my learning process;

Prof. Alvin Leung and Prof. Yujing Ni, for their endeavors to provide the useful academic resources and supporting network;

Dr. Lai Kwan Chan, my dear *Shijie*, for being so nice yet rigorous in providing good advice during the process of scale development and data collection, and for her caring for the well-being of my personal life;

Mr. Man Lun Cheng, Ms. Shuk Yi Fong, Ms. Shung Fong Chu, Mr. Siu Ki Hui, and Miss Wing Hung Tse, the colleagues at the Program for the Gifted and the Talented, for their great support and good administration in the whole process of data collection;

Huijing Lu, Xixi Li, and Lingyan Zhang, the members of my “statistics consulting committee”, for their unconditional support and precious help provided in solving the problems encountered in my study;

Jimei Dong and Huanu Xu, who have been with me from the first day till now, for their support in both academic and emotional realms;

Brothers and sisters in my fellowship, especially Michael, Haksin, Whe-ying, Xia Jiang, Xixi, Chenchen, Xinran, Xiling, Yuan Hao, Danxi, and Maymay, for their prayers for me and their spiritual connections with me;

Felicia, Ruomei, and Zhaoyang, my dear spiritually elder sisters, for their special help in my darkest times, because of their prayers and company, I walked out of “the valley of tears” and stepped into “the land of richness”;

Beanbean, my son, for bringing so much joy and rest into my life which is sometimes full of toils and difficulties;

Shane, my dear husband, for his ever growing love;

LORD Jesus, for His great agape and mercy, and for leading me, protecting me, and renewing me.

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Chapter 1 Introduction

1.1 Background

In the beginning of the new millennium, gratitude was largely an uncharted land in scientific research. Although enthusiastically promoted by popular books (e.g., Breathnach, 1996; Turner, 1998), profoundly embraced by theological traditions, and popularly cherished by folk views (e.g., in Shelton, 2004), gratitude was unfortunately neglected in human and social sciences such as psychology. McCullough and his colleagues (2001) regarded the neglect of gratitude as the embodiment of the general propensity of neglecting many positive emotions in the history of psychological research. They also indicated that the simplified treatment of gratitude as indebtedness or as politeness reduced the psychological nuance of gratitude (McCullough, Kilpatrick, Emmons, & Larson, 2001). Not being a subject much discussed in the philosophical literature, gratitude, explained by Berger (1975), was considered as not playing an important role in morality and thus not deserving extended treatment. He indicated the inadequacy of understanding the morality of interpersonal relations in which gratitude was involved and the insufficiency of making room for the affective life in our moral world and called for serious attention to the concept of gratitude. Solomon, as a philosopher, precisely yet sharply remarked that “we do not like to think of ourselves as indebted and we would rather see our good fortunes as our own doing (whereas the losses and sufferings are not our fault), thus the neglect of gratitude” (Solomon, 2004, p.v).

For nearly a decade, research on gratitude has greatly advanced. As an integral component of positive psychology (Seligman & Csikszentmihalyi, 2000; Linley, Joseph,

Harrington, & Wood, 2006), gratitude has been investigated largely along two lines of thoughts: one is the fundamental works on conceptualization and another is the association of gratitude with various aspects of human flourishing.

On conceptualization, gratitude has been theorized as a moral affect (McCullough, et al., 2001) and a dispositional trait (McCullough, Emmons, & Tsang, 2002; Watkins, Woodward, Stone, & Kolts, 2003). The uniqueness of gratitude has been demonstrated in terms of the difference from amusement (Bartlett & DeSteno, 2006; Tsang, 2006a) and from more general personality trait (Wood, Joseph, & Maltby, 2008). Some theoretical models of gratitude pertaining to its different affective levels were proposed and investigated (Wood, Maltby, Steward, & Linley, 2008; McCullough, Tsang, & Emmons, 2004). In addition, some efforts have been made to distinguish gratitude from indebtedness (Watkins, Scheer, Ovnicek, & Kolts, 2006; Tsang, 2006b).

Regarding the relationships between gratitude and human flourishing, experiencing gratitude has been found to increase psychological well-being (Emmons & McCullough, 2003; Park, Peterson, & Seligman, 2004; Watkins, 2004) and physical wellness (Bono & McCullough, 2006; Emmons & McCullough, 2003). Gratitude has been found to promote prosocial behaviors (Tsang, 2006a, 2006b; Tsang 2007; Bartlett & DeSteno, 2006) and strengthen social bonds in relationships and communities (Fredrickson, 2004; Algoe, Haidt, & Gable, 2008). Moreover, gratitude has also been associated with the development of social support and coping (Wood, Matby, Gillett, Linley, & Joseph, 2008).

In the increasingly cumulating literature on gratitude, one theme, the relationship between gratitude and indebtedness, is particularly intricate and intriguing. Our common

sense as well as research results (Fisher, Nadler, & Witcher-Alagna, 1982) have suggested the complexity of the reactions to aid, as quoted “help is often experienced as a mixed blessing” (p. 27). One may experience gratitude and liking toward the benefactor, one may also feel the possible negative consequences of receiving help such as feelings of failure, inferiority, and dependency. Particularly noticeable is that in our experiences, the feeling of gratitude is often intimately and delicately associated with the feeling of indebtedness. This might be a “mixed blessing” of gratitude. The mixed feeling of gratitude and indebtedness might deter us from experiencing the “panacea” functions that gratitude should exert in our daily life. Failure in understanding the relationship between gratitude and indebtedness may profoundly prevent us from embracing and appreciating gratitude.

Philosophical thoughts on gratitude are particularly insightful. Philosophers trenchantly pointed out the paradox of gratitude—human beings are not able to really enjoy the grace of a gift unless they understand the nature of “debt” as not repayable and embrace the “debt” as a bond of relationships (Simmel, 1908/1996; Roberts, 2004). Philosophers seem to highlight on the relatedness of gratitude and indebtedness. Gratitude is often felt as a mixed feeling, however, pure or genuine gratitude is possible when we are able to acknowledge and appreciate the ultimate human interdependence. But when philosophers contemplate upon the relation between gratitude and indebtedness, they generally refer to the more ideal state among people with higher developmental stage. For the ordinary people, the joy of gift and the fret of “debt” may simultaneously and intricately cast impact on our psychological functioning.

Chinese philosophical thoughts and cultural contexts integrated indebtedness deeply into gratitude by emphasizing *Baoen* –the repayment, requital, or return of the benefits that one has received. Ancient Chinese twenty-four stories of filial piety are somewhat extreme examples of the culture of *Baoen*. Among the stories, “*Guo-ju Mai-zi*” (郭巨埋子; a man named Guo Ju buried his newborn son in order to save food for his starving mother) and “*Wo-bing Qiu-li*” (臥冰求鯉; a boy lying on an icy lake caught fish to feed his father) are extremely far from the grace of gratitude as a free gift and exceedingly exaggerated the behaviors of repayment. Of course stories like these are passed on across generations as heroic and exemplary deeds of *Baoen*. However, the indispensable part of requital in gratitude may “squeeze” the warm feeling of thankfulness and appreciation but load certain psychological burden on our heart. It is plausible that overemphasizing *Baoen* might exert impact on the psychological functioning of Chinese people. In this connection, we may speculate that some people could be more dispositionally prone to experience feelings of indebtedness than others. In addition, those dispositionally more indebted people might be worse off in personal and interpersonal well-being.

1.2 Overview of the Study

Psychological research on gratitude and indebtedness has been rare. It appears that psychologists have shifted from treating the two as synonymous (Tesser et al., 1958; Greenberg & Westcott, 1983) to dissociating the two as distinct emotions (Watkins et al., 2006; Tsang, 2006b). However, no attempt has been made to conceptualize indebtedness at the level of affective trait as dispositional gratitude (McCullough et al., 2002) and investigate how dispositional indebtedness and gratitude can cast impact on human well-

being differentially. Rosenberg (1998) proposed a framework for the organization of affective processes, including the affective traits, “the stable predispositions toward certain types of emotional responding (p.249)” on the top of the hierarchy, the moods in the intermediate terrain, and the emotions, “acute, intense, and typically brief psychophysiological changes (p.250)” at the lowest level of the hierarchy. This study focused on gratitude and indebtedness at the two important levels, i.e., at the trait or dispositional level and the emotion or situational level. The overall research objective of this study is to understand the relationship between gratitude and indebtedness through two levels of analysis. This study consisted of one survey study (Study 1) and two experimental studies (Study 2a and Study 2b). Study 1 dealt with both gratitude and indebtedness at the level of affective trait. Two main research questions are: 1) Are gratitude and indebtedness empirically distinguishable as two dispositions? 2) How are gratitude and indebtedness differentially related to subjective well-being and helping tendencies?

At the level of emotions, psychologists have made some endeavors to dissociate gratitude and indebtedness. Gratitude was found to have a positive emotional valence whereas indebtedness was found to have negative affective associations. In addition, Tsang (2006b) found that the feeling of gratitude varied systematically under altruistic or ulterior helper intention but the feeling of indebtedness was not sensitive to whether helper intention was selfish or not. Watkins and his colleagues (2006) made the most successful dissociation to date by manipulating expectation to return communicated by the benefactor. They found that with the increasing expectation to return, participants reported increasing degree of felt indebtedness but decreasing degree of felt thankfulness.

Literature also suggests two other important variables that may dissociate gratitude and indebtedness. One is locus of help initiation (Greenberg & Saxe, 1975; Watkins et al., 2006), i.e., whether beneficiary requests help or benefactor offers help can elicit different responses of feeling grateful and indebted. Another is that feeling of gratitude and indebtedness may vary differently following the completion of reciprocal behaviors. After a beneficiary provides a return favor, one might expect that gratitude remains but indebtedness dissipates. Based on the literature, Study 2a and Study 2b investigated both gratitude and indebtedness at the situational level through eliciting the emotions by vignettes. Specifically, Study 2a investigated whether gratitude and indebtedness can be dissociated under different conditions of expectation to return and Study 2b examined whether the two can be dissociated under different conditions of locus of help initiation. Both Study 2a and 2b investigated the possible different emotional valence of gratitude and indebtedness and how they changed differently after the fulfillment of reciprocal behaviors.

Through investigating gratitude and indebtedness at trait and emotion levels, this study also enabled an examination on trait-emotion relationships. How traits influence the corresponding emotional states and how traits and emotions of gratitude and indebtedness affect prosocial motivation and the magnitude of reciprocation were investigated.

1.3 Significance of the Study

The field of gratitude is fresh and prospering. Drawing on Western and Eastern literature as well as more recent studies in psychology, the conceptualization of this study has led to viewing indebtedness as a component separable from the traditional notion of gratitude as a distinct construct. This study is the first attempt aiming at investigating

gratitude and indebtedness at both dispositional and situational levels to elucidate the interrelationships between the two constructs within and across levels. Particularly, in addition to treating gratitude as a dispositional trait, this study investigated whether indebtedness can be differentiated as a distinct affective trait from gratitude and whether dispositional gratitude and indebtedness were differentially associated with personal and relational well-being. The findings of this study shed lights on the distinctness between gratitude and indebtedness defined by “owing others” through demonstrating that gratitude and indebtedness were related but separate constructs, at both trait and emotion levels. This study also contributed through empirical testing of gratitude and indebtedness at the situational level.

The theoretical significance of this study lies in the conceptualization of gratitude and indebtedness. This study allowed the definitions for indebtedness as “owing others” and “obligation to repay” at both dispositional and situational levels and enabled our understanding of how gratitude and indebtedness were disassociated and associated as affective traits and as emotions. The importance of the findings on the differentiation between gratitude and indebtedness lies in studying the psychological construct of indebtedness as defined by “owing others”, which has received very scarce research attention in the literature. The association between gratitude and “obligation to repay” suggests that the role of Chinese culture on conceptualization and re-conceptualization should be fully considered in future research.

This study is also the first empirical study conducted in Hong Kong involving the population of Chinese young adolescents. Since research in the field of gratitude is primarily targeted on adults, this study on young adolescents contributed to further

understanding on gratitude and indebtedness of younger age population. The findings were particularly insightful for broadening our understanding of the differential effects of dispositional gratitude and indebtedness on personal and social development of our young people. The findings of how gratitude and indebtedness as dispositions and emotions affected prosocial motivation demonstrated clearly that gratitude but not indebtedness as the most significant predictor for prosocial motivation, which corroborated the “moral motivator” function of gratitude (McCullough et al., 2000) and expanded our knowledge of different influences of gratitude and indebtedness on prosocial motivation.

The findings also have important practical significance for throwing light on the value of the interventions to promote gratitude and well-being among children and adolescents. Moreover, the findings also suggest that cautions should be exercised in the designing and development of such interventions to avoid possible negative effect of feelings of indebtedness that might be elicited by the interventions. With fuller understanding of how gratitude and indebtedness differentially affected subjective well-being and helping tendencies, and with more careful design, the effectiveness of a gratitude-promotion intervention can be enhanced. In addition, the findings have important implications in moral education that moral educators should be encouraged to cultivate students' dispositional gratitude and not to educate students to form a disposition toward feeling owing others.

Lastly, the study provided some evidence for cultural similarities and differences of gratitude and indebtedness. The findings of how Chinese young adolescents responded to different social scenarios with different extent of feeling thankful, owing others, and

obliged to repay deepened our understanding of cultural influences on the contemporary young people.

Chapter 2 The Paradox of Gratitude

2.1 The Nature of "Debt"

Card (1988) eloquently described the paradox of gratitude in her series of questions: "If that for which gratitude is due was neither for sale nor a mere loan but was in some sense *gratis*, what sense does it make to feel indebted for it? How can one repay such a debt without transforming the transaction into one in which gratitude has no place? What kind of *debt* is this?" (p. 115). Card seemed to suggest the different and contradictory nature of gratitude and indebtedness, gratitude being a gift freely given out of grace but indebtedness being associated with exchange. If one fully appreciates the gift of gratitude, why one often bothers with feeling indebted?

Emmons and Crumpler (2000) provided an answer, "to be genuinely grateful is to feel indebted for a debt that can never be repaid. (p. 58)" It seems that if people understand that a "debt" of gratitude cannot be repaid for it represents human interconnection, they would be able to truly enjoy gratitude. Simmel (1908/1996) wrote in utmost clarity on the "irredeemable nature" of "debt" in sustaining interpersonal relationship: "gratitude actually consists, not in the return of a gift, but in the consciousness that it cannot be returned, that there is something which places the receiver into a certain permanent position with respect to the giver, and makes him dimly envisage the inner infinity of a relation that can neither be exhausted nor realized by any finite return gift or other activity" (p. 392). The irredeemable debt for Simmel is not a forever heavy debt that can prompt pathological feelings, but an unexhausted social bond. Similarly, Meilaender (1984) commented that "obligations and debts which of their very nature cannot be

adequately fulfilled and discharged” (p. 163). Roberts (2004) even define gratitude as glad acceptance of being indebted to others. Therefore, as Emmons and Crumpler summarized, “gratitude involves a willingness to remain indebted, to acknowledge dependency on the benefactor” (Emmons & Crumpler, 2000, p. 58).

The paradox of gratitude stems from the intertwined relationship between gratitude and indebtedness. The debt of gratitude seems inseparable from gratitude itself. But embracing “debt” as something favorable is counterintuitive. The ideal state of mentality, i.e., the appreciation of debt as an integrated component of gratitude, may only apply for those people who are more mature and with higher developmental stage in morality.

2.2 Gratitude as Virtue or Obligation

Ever since Roman Stoic philosopher Seneca (around AD. 54; Seneca, 1935/2001), some philosophers depict gratitude as a moral virtue (e.g., Adam Smith, 1790/2000; Thomas Hobbes, 1651/1991; Wellman, 1999); others portray gratitude as a moral obligation (e.g., Thomas Aquinas, 1981; Berger, 1975; Card, 1988). Philosophers who regard gratitude as a virtue understand profoundly how gratitude makes a person virtuous and a society harmonious. George Simmel argued that “Although it (*gratitude*) is a purely personal affect, or (if one will) a lyrical affect, its thousandfold ramifications throughout society make it one of the most powerful means of social cohesion” (Simmel, 1908/1996, p. 389). For Hobbes (1651/1991), gratitude is a necessary condition to assure us that self-interested people are willing to act in disinterested ways for the benefit of others and for society in general. Gratitude builds bonds of harmony and community in the world (Harpham, 2004). As in Tronto’s term, gratitude is a social virtue that promotes general sociability in society as a whole (Tronto, 1999).

Those philosophers who treat gratitude as an obligation, however, have to explain that gratitude is a peculiar obligation (Meilaender, 1984), an unusual duty (Berger, 1975), or informal obligation (Card, 1988) because the meaning of “obligation” in ethics fits awkwardly with the nature of gratitude as something of grace. Berger emphasized the role that gratitude plays in the morality of interpersonal relation. Demonstration of gratitude is a duty because it is a response to other’s benevolence which involves a set of beliefs, feelings, and attitudes. In giving and receiving with thanks, both parties express respect and regard, therefore serve to strengthen the bonds of moral community (Berger, 1975). Although it is good to assume one’s duty to express gratitude, however, no one has the right to demand it. This is why Card (1988) used the term “informal obligation” to delineate the obligation which is not closely related to rights. Similar to Berger, Card (1988) changed the role of a receiver from the metaphor of a debtor to a trustee, in that the giver has confidence in the receiver’s character. Thus, as the receiver lives up the obligation to the giver, they become friends or closer friends.

As a virtue, gratitude is something to be desired and cultivated whereas as an obligation, gratitude is something one should do. We have “virtue-making” reasons or “duty-imposing” reasons to take a certain action (Wellman, 1999, p. 292) after receiving other’s benefit. Once we fail to take the action out of “duty-imposing” reasons, we are bound to indebtedness. Gratitude as obligation brings indebtedness naturally into the dynamics of gratitude.

Understanding the nature of debt as irredeemable can possibly set us free from the debt of gratitude and bring the enjoyment of giving and receiving to us. However, few people can apply such an ideal state of gratitude in the interpersonal relationship of daily

life. People might understand gratitude as a virtue or as an obligation. Those who conceive gratitude as a virtue may develop and cultivate a disposition of gratitude; those who understand gratitude as an obligation, however, may be more vulnerable to form a disposition of indebtedness.

2.3 *Bao-en*: Chinese Philosophical and Cultural Contexts

En in Chinese culture dates back to ancient China over many generations. In *Pei-wen Yun-fu* (佩文韻府), which was originally compiled in Qing Dynasty, we can examine the usage of *En* throughout history and scrutinize the impact it has on Chinese culture. Among approximately one hundred words including *En*, the vast majority are nouns describing what kind of *En* that men can experience such as *Qin-en* (Grace of parents; 親恩), *Huang-en* (Grace of emperor; 皇恩), and *Tian-en* (Grace of heaven or God; 天恩). Most of the usage of various kinds of *En* has been obsolete. Some words concerning how *En* is experienced are still well understood if not in use nowadays. *Meng-en* (蒙恩) and *Cheng-en* (承恩) mean receiving benefit or grace; *Xie-en* (謝恩) stresses thankfulness as a rule of etiquette; *Shi-en* (施恩) is giving favor or showing leniency. It should be noted that *Pei-wen Yun-fu* is an important reference book subsuming the most famous and influential poems and proses in different dynasties, therefore the quantity of poems collected to demonstrate the usage of a certain word indicate the significance and impact of the word. Under careful scrutiny, *Bao-en* (報恩) and *Gan-en* (感恩) are found to be the two words most frequently used in poems and proses, with ten for *Bao-en* and four for *Gan-en*. Therefore, as reflected in literature, *Bao-en* has relatively important position in Chinese culture. Admittedly, *Shi-en* is also emphasized especially in the ancient

literature of Taoism and Buddhism. For instance, the 32nd verse in *Tai-shang Gan-ying Pian* (太上感應篇) of Taoism emphasizes the attitude of the giver, not to ask for repayment and not to regret for offering (施恩不求報，與人不追悔). Particularly relevant to the present study is the culture of *Bao-en* and *Gan-en*.

Central to the Chinese experience of gratitude is the concept most frequently expressed by two characters *Bao-en* (報恩). In Chinese, *Bao* has the meaning of “to return”, “to repay”, “to respond”, “to retaliate”, “to requite”, etc. whereas *En* means grace, kindness, gift, etc. In experiencing gratitude, one is obligated to repay other’s kindness. Failing to act upon “repaying” means an incomplete experience of gratitude (Nagatomi, 1989). The emphasis on repaying as an integral part of gratitude is deeply rooted in Confucian thoughts. *Bao-en* is the underlying motivations of the four fundamental virtues: *Zhong*, *Xiao*, *Jie*, and *Yi* (忠孝節義; Fealty, filial piety, chastity, and loyalty). Fealty is for repaying the grace from King; filial piety is for repaying the grace from parents; chastity is for repaying the grace from husband; loyalty is for repaying the grace from friends (忠爲報君恩；孝爲報親恩；節爲報夫恩；義爲報友恩, in Ren, 2000). Confucian teaching is so pervasive that every Chinese knows one should *Zhi-en* (知恩; acknowledge and appreciate the grace or gift) *Tu-bao* (圖報; feel the need to repay). Moreover, one should repay hundredfold or thousandfold as in “*Shou-ren Di-shui Zhi-en, Dang-yi Yong-quan Xiang-bao*” (受人滴水之恩，當以湧泉相報; once getting a drop of water, one should give back a spring. Chan, 2008). Through ancient Chinese twenty-four stories of filial piety, one is taught to learn from the examples of thousandfold repayment to parents.

Therefore, indebtedness or obligation to repay is deeply integrated into gratitude. By emphasizing *Bao-en*, Chinese philosophers attempt to construct systematic social order and to realize their philosophical ideals. Emphasis of *Bao-en* may indeed be helpful for encouraging people's reciprocal behaviors; however, it may also deter one's readiness to accept and ask other's help because of the feeling of indebtedness. One can be very cautious in the giving and receiving process to avoid the burden to repay. More ironically, too much debt or obligations to repay may make no room for the warm feeling of thankfulness. Most devastating is that overemphasis of *Bao-en* as a cultural influence may cause people more frequently and intensely feel indebtedness, thus leading to a disposition of indebtedness rather than gratitude in a long run.

The close association between gratitude and indebtedness often leaves us with a paradox of gratitude. The paradox of gratitude may be understood from both perspectives from daily-life experiences and philosophical thoughts. In everyday life, the paradox of gratitude is demonstrated as the contradictory feelings or motivations that we experience during the giving and receiving process. We may feel the joy of receiving but at the same time the state of owing others or obligation to repay may let us feel somewhat uncomfortable, unpleasant, or even aversive. Sometimes we repay to the benefactor out of full appreciation, sometimes we simply repay to get out of the "trapping" position of being in debt, at other times we failed to do anything for the contradictory feelings. Chinese people are extremely and strongly encouraged to requite the benefactor but they might lose the enjoyment of giving and receiving in the first place just because of the overemphasis of repayment.

In philosophical thoughts, the opposite ideas of “debt” and “gift” that seemingly impossible or unlikely to be integrated, are integrated to become one cohesive and harmonious concept of genuine gratitude. Western philosophers proposed a high level of understanding toward genuine gratitude through appreciating the nature of debt as not repayable and as a social bond to facilitate the full enjoyment of the grace of gift. If one deeply understands their insightful ideas, one should be able to enjoy gratitude without being bothered by the problem of indebtedness.

The paradox of gratitude from the above two perspectives seems to have some interesting indications. It suggests that there might be a developmental stage on people’s gratitude development. People might view “debt” differently at different stages of development, from seeing it as aversive and unfavorable, gradually to acceptable, pleasant, and appreciative. For people at the early stage of development or still on their way to achieve higher development, there seems to be a need to understand how gratitude and indebtedness might function differently in their daily life. If people are equipped with the knowledge of the relationship between gratitude and indebtedness and understand in what way gratitude and indebtedness could be differentiated, they might be more able to enjoy interpersonal relationships and social life. One plausible way to achieve a better understanding is to deliberately separate gratitude and indebtedness and study how the two functions differently. Psychological methods make the separation possible and psychologists have already made some contributions.

Chapter 3 Gratitude and Indebtedness as Two Separate Traits and Emotions

The literature on gratitude suggests that gratitude and indebtedness are associated with each other in some ways, and also are disassociated with each other in other ways. This chapter begins with describing the associations and disassociations between gratitude and indebtedness, followed by introducing two levels of analysis adopted in the present study as the framework for investigation. Then in accordance with the two-level structure, this chapter reviews the relevant literature for understanding the relationships between gratitude and indebtedness at both the dispositional (trait) level and the situational (emotion) level.

3.1 Associations between Gratitude and Indebtedness

Gratitude seems purely positive; whereas indebtedness is defined in terms of gratitude or closely linked to gratitude. The word “gratitude” is derived from the Latin root *gratia*, meaning grace, graciousness, and gratefulness (Peterson & Seligman, 2004). All words with this root have the meaning of “kindness, generousness, gifts, the beauty of giving and receiving, or getting something for nothing” (Pruyser, 1976, p. 69, cited in Emmons and McCullough, 2003). Indebtedness, however, is typically defined as “owing gratitude for a service or favor” (e.g., in Oxford Dictionary of English, 2nd Edition Revised) or as “under obligation” (e.g., in The Concise Oxford Dictionary of English Etymology). Earlier definitions of gratitude and indebtedness were found to be quite similar in Samuel Johnson’s *A Dictionary of the English Language*. Johnson (1755/1983) defined gratitude as “duty to benefactors” or “desire to return benefits”, and defined indebtedness as

“obliged by something received; bound to restitution; having incurred a debt.” Later definitions of gratitude involved emotional aspects. *Websters Dictionary* (1828) defined gratitude as “an emotion of the heart, excited by a favor or benefit received; a sentiment of kindness towards a benefactor; thankfulness.” The definition of indebtedness in *Websters* was almost identical to Johnson’s: “obliged by something received, for which restitution or gratitude is due.” The early definitions of gratitude and indebtedness indicate that there is a fundamental connection between the two and they were understood differently at different times.

Gratitude and indebtedness appear intimately intertwined with each other in our language. The two words are used as synonymous in English. “If you say you are indebted to someone for something, you mean that you are grateful to them for something” (*Collins COBUILD Advanced Learner’s English Dictionary*). In some cultures, the meanings of gratitude and indebtedness seem so intimately connected that they can be expressed by one word. For instance, in Japanese, the conventional expression of apology “*sumimasen*” is also used to express the feeling of thanks (see Naito, Wangwan, & Tani, 2005). Similarly, the Chinese expression of *Xie* (謝; thank you) also has meanings of apology as in *Xie-zui* (謝罪; offering an apology). Chan (2008) also found an interesting expression of *Ng-gai* (唔該; literally meaning that I should not or I should not allow this) in Cantonese, which is commonly used in daily expression of “thanks” or “excuse me”. Although the literal meaning is not used nowadays, it suggests the close associations between gratitude and indebtedness.

Gratitude and indebtedness are regarded as similar impetus to repayment for some philosophers and anthropologists. For instance, Seneca (1935/2001, *On Benefit*, 2.22.1)

pointed out that “He who receives a benefit with gratitude repays the first installment on his debt.” Komter (2004, p. 208), echoed that, “indebtedness is not in any way contrary to gratitude, but rather is its moral core.” Thus, in terms of the consequence of repayment behaviors, gratitude and indebtedness are deemed to be essentially the same. Likewise, the duty to return the received benefit led the social psychologist Barry Schwartz (1967) to speak of the “gratitude imperative” (cited in Komter, 2004).

Gratitude and indebtedness were treated synonymously in earlier psychological research. For instance, Tesser and his colleagues (1968), in their seminal study, computed a composite dependent variable of gratitude by combining “feeling grateful” and “feeling indebted” because the two variables were significantly correlated. Greenberg focused on a theory of indebtedness rather than of gratitude inasmuch as he perceived the two as interchangeable (Greenberg, 1980) and gratitude as one of the positive feelings emerging from indebtedness (Greenberg and Westcott, 1983). Naito and colleagues theorized indebtedness as a component in the emotional system of gratitude (Naito, Wangwan, & Tani, 2005).

3.2 Disassociations between Gratitude and Indebtedness

Gratitude and indebtedness were also disassociated in their different origins, definitions, determinants, and consequences. Both theoretical and empirical endeavors suggest interesting ways of disassociations.

3.2.1 Gratitude

The basis of gratitude in psychoanalytic theory is the joy from breast-feeding and mother-infant attachment (Klein, 1957). Klein (1957) saw gratitude as the protector of

loving feelings, opposing it to greed in her classic book *Gratitude and Envy*. Gratitude, to Klein, is “essential in building up the relation to the good object and ... the appreciation of goodness in others and in oneself (Roth, 2008, p.15)”.

General conceptualization of gratitude has been made from diverse perspectives. Gratitude has been defined in terms of motivation, “the willingness to recognize the unearned increments of value in one’s experience” (Bertocci & Millard, 1963, p. 389), and in terms of cognitive process, “an estimate of gain coupled with the judgment that someone else is responsible for that gain” (Solomon, 1977, p. 316). Emmons and Crumpler (2000) clearly defined gratitude from an affective perspective, “an emotional response to a gift” (p. 56). Fitzgerald (1998) provided a definition of gratitude having emotional, motivational, and behavioral components: 1) a warm sense of appreciation for somebody or something, 2) a sense of goodwill toward that individual or thing, and 3) a disposition to act which flows from appreciation and goodwill (p. 120). More recently, McCullough (2002) defined gratitude as “a cognitive-affective response to the recognition that one has been the beneficiary (or, in some cases, only the intended beneficiary) of someone else’s good will” (p. 303). It seems that contemporary psychologists have generally reached a consensus to define gratitude as a positive affective response to receiving benefits.

Earlier psychological theorizing of gratitude mainly pertains to cognitive-emotion theories which aim to elucidate the specified cognitions as causes of feeling grateful. The cognitive factors include intentionality (Heider, 1958), attribution (Weiner, 1985), standards and attitudes (Ortony, Clore, and Collins, 1988), and the capacity to empathize with others (Lazarus and Lazarus, 1994). According to social psychologists, people most

commonly experience gratitude when three conditions are met: a) they have received a benefit that they perceive as valuable; b) they acknowledge that the benefit is out of the benefactor's good intentions; and c) they feel positively about the benefit and the benefactor (Emmons & Crumpler, 2000; Heider, 1958; Ortony, Clore, & Collins, 1988).

3.2.2 Indebtedness

Indebtedness arises from the norm of reciprocity (Greenberg, 1980), a universal moral norm stating that "(1) people should help those who have helped them, and (2) people should not injure those who have helped them" (Gouldner, 1960, p. 171). Indebtedness results from the felt need to comply with the norm. In the context of giving and receiving, once an individual understands the social norm, he or she possibly feels obliged to act according to the norm, which is to engage in repayment or giving in return.

Heider (1958) perceived indebtedness as one of the responses to receiving a benefit and defined it as a feeling that one ought to repay a benefactor for a benefit. In line with this thought, Greenberg (1980) defined indebtedness as "a state of obligation to repay another" (p. 4). The state of indebtedness is associated with felt arousal and discomfort (Greenberg, 1980). When people are made to feel obliged, they frequently experience negative feelings toward the benefactor because being indebted restricts an individual's freedom (Brehm & Cole, 1966), reduces his or her power and status relative to the benefactor (Blau, 1964), and makes the individual worry about the anticipated costs of returning the favor. Indebted people tend to focus on their obligation to repay others, fear of being unable to repay, and worry about how they might actually go about repaying (Malinowski, 1922; Greenberg, Block, & Silverman, 1971; McCullough et al., 2001).

Apparently similar to gratitude, feelings of indebtedness are engendered when an individual has received a benefit from others. However, according to Greenberg (1980), indebtedness tends to be provoked by normative pressure or others' calculated moves.

3.2.3 Theoretical and empirical differences

It can be seen that gratitude and indebtedness may stem from different roots. As stated, indebtedness has been closely linked to the norm of reciprocity (Gouldner, 1960); gratitude, derived from early healthy attachment relationship, however, seems to go above and beyond the "tit-for-tat" mentality. Fredrickson (2004) proposed that gratitude, like other positive emotions, "broadens people's momentary thought-action repertoires and builds their enduring personal resources" (p. 147).

In recent studies, gratitude and indebtedness are found to have opposite emotional valence. Gratitude is a pleasant emotion (Mayer, Salovey, Gomberg-Kaufman, & Blainey, 1991; Reizenzein, 1994) and is connected to positive psychological states such as contentment (Walker & Pitts, 1998), happiness, pride, and hope (Overwalle, Mervielde, & De Schuyter, 1995). A Gallop poll of American teens and adults indicated that over 90% of the participants feel that gratitude is a happy state (Gallup, 1998). However, most people experience indebtedness as unpleasant and aversive (Buunk, Doosje, Jans, & Hopstaken, 1993; Greenberg, Bar-Tal, Mowrey, & Steinberg, 1982). Indebtedness was found to be linked to some negative affect factors such as shame, regret, and uneasiness (Naito, Wangwan, and Tani, 2005) and guilty, flustered, and uneasy (Watkins et al., 2006).

Gratitude and indebtedness were confounded in their reciprocal reactions; however, recent research advances have provided several differences in terms of reciprocal

behaviors. According to Schaumberg and Flynn (2009), gratitude “inspires a ‘want to’ form of reciprocity” whereas indebtedness “evokes a ‘have to’ response” (p. 111). Moreover, the feeling of indebtedness reflects a benefit recipient’s focus on equity in social exchanges (Greenberg, 1980); therefore reciprocation out of indebtedness involves a return favor of equal value to the benefactor. Feeling of gratitude, however, can elicit costly reciprocation. Bartlett and DeSteno (2006) found that participants voluntarily helped the benefactor with a tedious and time consuming survey. Regretfully, they did not include feeling of indebtedness in their study thus leaving the possibly different consequences remain speculative. Tsang (2007) also found that gratitude was a better mediator of the association between receiving a gift and reciprocating a favor than was indebtedness. Unlike indebtedness, gratitude is not restricted to reciprocate to the benefactor. According to Nowak and Roch (2007), gratitude is associated to upstream reciprocity, which is targeted on persons other than the benefactor. Bartlett and DeSteno (2006) found that participants in a confederate-induced state of gratitude voluntarily helped a stranger in addition to their benefactor.

Gratitude and indebtedness have distinct action tendencies and effects on prosocial behaviors. Watkins and his colleagues found gratitude responses were positively and reliably associated with prosocial thought/action tendencies such as adoration, approach, and yielding, and negatively associated with antisocial action tendencies such as active against and passive against (Watkins, Scheer, Ovnicek, & Kolts, 2006). However, they found indebtedness was not reliably correlated with any of the action tendency factors. They went further to find distinct motivational aspects of the two constructs, that is, with increasing expectations for returning benefit by a benefactor, recipients reported

decreasing gratitude and increasing indebtedness, and less likelihood of helping the benefactor in the future. In a related finding, Goei and his colleagues showed that feeling obligated after receiving a favor does not uniquely predict compliance with a request to perform a favor for the benefactor after controlling for gratitude statistically. In contrast, gratitude predicts compliance even after controlling for indebtedness (Goei & Boster, 2005; Goei, Roberto, Meyer, & Carlyle, 2007). Gratitude is also found to orient people toward relationship building (Algoe, Haidt, & Gable, 2008).

In sum, research has provided some theoretical orientations and initial evidence suggesting that gratitude and indebtedness, although both as potential reactions to the receipt of a benefit, are related but could be separated from each other. However, existing literature only addressed this difference by treating both gratitude and indebtedness as emotional states. To sufficiently address the possible qualitative differences between gratitude and indebtedness, we should consider the two at a higher level by introducing individual differences. Are some people predisposed to be more grateful and others more indebted? Moreover, how do grateful people differ from indebted people in their personal and social well-being?

Psychologists studied the effects of grateful disposition. As an affective trait, McCullough, Emmons, and Tsang (2002) conceptualized gratitude as an enduring disposition of thankfulness that is sustained across situations and over time. They found that disposition toward gratitude was associated with three sets of variables: positive affects and well-being, prosocial traits and behaviors, and spirituality. They also found that gratitude trait is negatively associated with envy and materialistic attitudes. Moreover, these associations persist after controlling for fundamental personality traits

(i.e., extroversion, neuroticism, and agreeableness). In the same line of thought, one may speculate that people who are dispositionally indebted should be different from those who have a disposition of gratitude.

However, no attempt has been made to find possible distinctions between gratitude and indebtedness at the level of affective traits and to investigate long-term effects of indebtedness in addition to those effects of gratitude. Chinese philosophers integrated gratitude and indebtedness by introducing the ideology of *Bao-en* and thus making the two seemingly inseparable. However, *Bao-en*, is so highly emphasized as indispensable experience of gratitude, and so deeply permeated in every manifestations of social relations, that people may be profoundly influenced by the “debt” to requite. Dispositional indebtedness may plausibly have some not-so-positive impact on people’s personal and social well-being.

3.3 Two Levels of Analysis: Trait and Emotion

In order to understand gratitude and indebtedness in a deeper and more thorough way, the present study adopted Rosenberg’s organization of affect to conduct two levels of analysis treating both gratitude and indebtedness at trait level and emotion level.

3.3.1 Rosenberg’s organization of affect

According to Rosenberg (1998), the common forms of affective experience could be organized at three levels, i.e., at the level of affective traits, moods, and emotions. Rosenberg (1998) put the affective traits on the top of the hierarchy and defined it as “the stable predispositions toward certain types of emotional responding (p.249)”, the moods in the intermediate terrain between affective traits and emotions, and the emotions at the

lowest level of the hierarchy as “acute, intense, and typically brief psychophysiological changes (p.250)”. Moods share characteristics or properties with both affective traits and emotions and were often confounded with emotions in research because both are more transient states comparing with affective traits which are enduring. The present study focused on gratitude and indebtedness at the two important and more distinct levels, i.e., at the level of affective traits and the level of emotions. Therefore, in addition to treating gratitude at affective trait and emotion levels, the study conceptualized indebtedness at both affective trait and emotion levels.

The affective trait, which is relatively stable and enduring, “set the threshold for the occurrence of particular emotional states (Rosenberg, 1998, p. 249)”. Affective traits at the highest level of the affect hierarchy seem to guide emotions and lower the thresholds for emotion elicitation. For instance, a hostile person is thought to have lower threshold to feel anger. Likewise, a grateful person has lower threshold to feel appreciation and thankfulness. An indebted person may be predisposed to be more readily and easily to feel like owing others and obliged to repay in his or her daily life.

The appreciation and application for the two-level organization of both gratitude and indebtedness leads to the threefold objective of the present study. First, at the affective trait level, to examine whether the two possibly distinct types of affective dispositions can be differentiated and to find out the ways in which they differentially influence well-being; Second, at the emotion level, to investigate whether they can be disassociated as distinct emotional states under specific social situations and circumstances; Third, to investigate the interaction between traits and emotions and how they might jointly affect prosocial motivation and behaviors.

3.3.2 Conceptualization of the study

Given the central framework of two levels of analysis, it is important to define both gratitude and indebtedness clearly at affective trait and emotion levels. As a result of careful considerations at Chinese cultural impact and linguistic usage, translations relevant to the definitions were also presented as follows.

3.3.2.1 Defining gratitude

In this study, following the modern psychological definitions, gratitude is defined as the positive responses for a good outcome that one received from others. In Chinese, gratitude has a corresponding word *Gan-en* (感恩). *En* means “grace or kindness, benefit or favor that others give me or I give others” (“他人給我或我給他人之情誼、利益稱之曰恩”) (*Zhong-zheng Xing-yin-yi Zong-he Da-zi-dian*; 中正形音義綜合大字典, p. 494). *Gan-en* is appreciation of other’s grace or benefit. In addition to the adjective form “grateful” (“感恩的”), other two synonymies “thankful” and “appreciative” were also used in this study. “Thankful” were translated into “感謝” and “appreciative” into “感激” in Chinese. In Chinese, “grateful” is the most formal and solemn word among the three. The three words, “grateful”, “thankful”, and “appreciative” were often used to measure feelings of gratitude as a composite variable in literature and were found to have high internal consistency (e.g., $\alpha = .96$, in Tsang, 2006b and $\alpha = .98$, in Tsang, 2007 among university students). An initial study conducted by the author among 412 Hong Kong primary and secondary students found that the internal consistency among the students’ ratings on the three words (grateful, thankful, and appreciative) was relatively lower ($\alpha = .79$). Therefore, the three words are considered as having similar but not identical

meanings and were carefully used in accordance to the contextual meanings when measuring dispositional gratitude in the survey study. “Thankful” was used when describing a certain situation in experiments of the present study, considering that it is more frequently used in daily conversations and circumstances.

3.3.2.2 Defining indebtedness

There are two ways to define indebtedness in psychological literature. One is to define indebtedness as “the state of obligation to repay” (Greenberg, 1980, p4). Another way is to define indebtedness from the emotional aspect as “feeling like owing others” (e.g., in Watkins et al., 2006, p. 228). The two definitions are not necessarily the same for some reasons. First, feeling obligated to repay indicates a motivational state in addition to an emotional state. According to Greenberg (1980), indebtedness has motivational properties: the greater the discomfort an individual experience after receiving a benefit, the greater the individual’s attempts to reciprocate the benefit to reduce the feeling of discomfort. Second, feeling obliged to repay may be more related to a certain giving-and-receiving situation whereas feeling owing others can be more general and abstract. Third, feeling obliged to repay might be based on both positive and negative motivations. Research on approach-avoidance motivation has found that the ought motive can be separated into two broad categories: approach and avoidance (Higgins, 1997), indicating that one can be obliged to seek positive outcomes or to do something to prevent negative outcomes from happening. Therefore, “obligation to repay” may be due to the motivation to achieve better relationship or to reduce one’s uneasiness.

The above possible differences are theoretical and still await empirical validation. Therefore, this study provided the opportunity for conceptual clarification of the two

definitions. In the survey study treating gratitude and indebtedness at affective trait level, indebtedness was defined as both “feeling owing others” and “obliged to repay” in accordance to the contextual meanings indicated when measuring dispositional indebtedness. At emotion level, the two were also included when asking for emotional responses to a certain situation.

The word “indebted” is translated into *Meng-en-de* (蒙恩的; receiving of benefits) and *Gan-ji-de* (感激的; appreciated) in the English-Chinese Dictionary of Oxford Language Dictionaries Online. The translation is problematic for it fails to reflect the state of owing or being in debt as the essential meaning of indebtedness. The Chinese character *Qian* (欠; owe) should be involved for an appropriate translation. *Qian* originally means owing someone an economic debt, but later has been applied in other realms. For instance, in *A Dream of Red Mansions* (紅樓夢), “The one who owed others a life debt, has repaid the debt with his or her own life; owed others tears, has drained his or her own tears” (欠命的，命已還；欠淚的，淚已盡。). Particularly interesting is that owing others tears involves a beautiful and sad story about indebtedness. *Lin Dai-yu*, transformed from a crimson pearl grass, drained all tears in her lifetime to repay the grace of nurturing offered by the former *Shen-ying* Servant (神瑛侍者) *Jia Bo-yu*. *Qian*, in this particular case, means *Kui-qian* (“虧欠”) or *Gai-qian* (“該欠”), is especially relevant to the realm of sentiment, affect, and grace (*Ci-yuan*; 辭源, p. 893).

Accordingly, at the dispositional level, indebtedness defined as “owing others” was translated into “虧欠” (*Kui-Qian*). At emotion level, to better accommodate to daily usage, “owing others” was translated into “欠……的情” (*Qian-Qing*; literally means

owing someone the debt of affection) in specific situations described in the experiments. Indebtedness defined as “obliged to repay” was translated into “必須償還” in describing dispositional trait and “有必要回報” in response to specific situations. It is noteworthy that the translation was a revision based on the former inappropriate translation of “obligated” into “有責任的” (correlation between obligated and indebted were found to be approaching zero in the above-mentioned initial study involving Hong Kong primary and secondary students).

3.3.3 Measures of gratitude and indebtedness

3.3.3.1 Measures of gratitude

a) Gratitude Questionnaire-6

McCullough, Emmons, and Tsang (2002) distinguished four facets of grateful disposition: Intensity, frequency, span, and density. In terms of intensity, grateful people are likely to feel a stronger sense of gratitude for a positive event than less grateful people. For the facet of frequency, grateful people tend to report feeling grateful or thankful more frequently or more easily throughout the day. Span refers to the number of life circumstances that a person feels grateful for at a given time. Thus, grateful people have a wider aspects of life circumstances for which they are grateful at any given time with a variety of other benefits (e.g., for their families, their health, and life itself). Density refers to the number of persons to whom one feels thankful for a single positive outcome. Accordingly, grateful people are more likely to experience gratitude toward more people (e.g., parents, teachers, and friends etc.) for a single life circumstance. To examine the nature of gratitude as a disposition, McCullough and his colleagues (2002) developed the

6-item self-report Gratitude Questionnaire (GQ-6), which assesses the four facets of grateful disposition. The scale has been reported to have sound psychometric properties, including a robust one-factor structure through exploratory and confirmatory factor analysis, convergent validity peer reports, correlations with well-being and discriminant validity from related traits (McCullough et al., 2002).

b) Gratitude, Resentment, and Appreciation Test

Watkins, Woodward, Stone, and Kolts (2003) conceptualized dispositional gratitude differently as a combination of four distinct characteristics: Acknowledgement of the importance of expressing and experiencing gratitude, lack of resentment (feelings of a sense of abundance rather than deprivation), appreciation for the contributions of others, and appreciation of simple pleasures. To assess these characteristics, they developed the 44-item self-report Gratitude, Resentment, and Appreciation Test (GRAT). They found evidence of construct validity of three factors labeled as a sense of abundance, simple appreciation, and appreciation of others. The GRAT scores were found to relate positively with satisfaction with life and negatively with depression. The short-form scale was found to correlate positively with spiritual transcendence and negatively with materialism (Diessner & Lewis, 2007).

c) Appreciation Scale

Alder and Fagley (2005) attempted to capture the full range of representative responses of college students' appreciation experiences and focused broadly on appreciation in terms of eight dimensions: Appreciation of people, possessions, the present moment, rituals, the feeling of awe, social comparisons, existential concerns, and gratitude behaviors. They developed the 57-item Appreciation Scale (AS) to assess these

eight dimensions of appreciation. An 18-item abbreviated scale was also constructed based on factor analysis of the full scale. In their study, they also reported positive and significant correlations between AS scores and life satisfaction as well as positive affect.

Comparatively, GQ-6 is more concise and has now been recognized as the most widely used scale for assessing dispositional gratitude (see Emmons, McCullough, & Tsang, 2003). More importantly, its focus on the four “facets” rather than “dimensions” effectively avoids high repetition of items commonly found in other scales and emphasizes the common features or elements of people’s psychological and interpersonal experiences of gratitude. Based on these reasons, the present study adopted GQ-6 as a basis to further investigation of differentiation between gratitude and indebtedness.

3.3.3.2 Measure of indebtedness

Greenberg and Westcott (1983) attempted to develop Indebtedness Scale to measure creditor personality, characterized by high sensitivity to the obligation of repayment and giving greater value than having received in order to avoid the aversive state of being a recipient and enjoy the state of being a creditor. The idea of creditor personality was drawn on by Eisenberger and his colleagues (1987) to propose creditor as an ideology of reciprocation and was later adapted in the field of organizational psychology. Creditor personality might be one of many possible behavioral manifestations of those people who are sensitive to indebtedness.

Following Rosenberg (1989), we may conceptualize indebtedness as an affective trait in the same line with conceptualizing gratitude at the level of affective trait. Similar to the threshold-setting effect of dispositional gratitude, dispositional indebtedness sets a threshold for feeling owing others or obliged to repay. Therefore, dispositionally more

indebted people are more likely to feel the state of owing others than those less indebted people. It might be helpful to use the same four facets in GQ-6 to measure indebtedness disposition. It is plausible that people who are disposed toward indebtedness may feel like owing others more intensely, report feeling owing others or obliged to repay more often and more readily in daily experience, have broader life aspects or situations to be indebted for at any given time, and may feel owing others or obliged to repay toward more people.

3.3.4 Gratitude and indebtedness at different ages

Some progress has been made in understanding gratitude in adults. However, little is known for gratitude in children and adolescents. Children express gratitude more often and understand gratitude from concrete to abstract as they age. Only 37% of preschool children said "thank you" upon receiving a sticker (Becker & Smenner, 1986). From the ages of 6 to 10, children begin to thank adults for the candy without prompting (Gleason & Weitraub, 1976). Children's more abstract understanding of gratitude seems to appear at around age 8 (Graham, 1988). Children aged 5 to 11 reported feeling more gratitude in a scenario where a favor was under the benefactor's control, compared to when the benefactor was forced to give the favor, and this distinction was made more often by children aged 8 and older (Graham, 1988). Children and adolescents seem to differ in their experience and expression of gratitude. Baumgarten-Tramer's (1938) distinction of concrete gratitude and connective gratitude clearly illustrate the difference. In her sample of 1,059 school children aged 7-15, 51% of 8-year-olds and 6% of 12 to 15 year-olds reported concrete gratitude expressed by giving something specific (e.g., a book) for the person granted his or her greatest wish, whereas till the age of twelve 60% of the children

reported connective gratitude characterized by creating a relationship with the benefactor (e.g., I would help him in case of need). It seems that young adolescents lose some of their self-centeredness and are capable of abstract thought that corresponds to their social understanding and level of empathy.

Understanding of indebtedness appears to develop in later ages than that of gratitude. Children understand the norm of reciprocity (Gouldner, 1960) by approximately 5 to 6 years of age (Berndt, 1977; Youniss, 1980). Indebtedness, as the basis for compliance with the norm, may be understood from the middle to late elementary school years (De Cooke, 1992).

The present study focused on the population of young adolescents who are able to understand not only gratitude but also indebtedness. The intention is to make some contributions especially for understanding gratitude and indebtedness among younger people. The focus of young adolescents also reflected the consideration that the examination of the possible individual differences of dispositional gratitude and indebtedness among young people are particularly meaningful because early-age differentiation lent more cogent support for treating gratitude and indebtedness as two separate traits. In addition, the differential impact of dispositional gratitude and indebtedness on well-being had important practical implications for the enhancement of the well-being of children and adolescents. Therefore, this study selected the students from late primary to middle secondary years and aged 9 to 15. It seems appropriate to focus on the young adolescents of this age range in the present study encompassing both gratitude and indebtedness.

3.4 Gratitude and Indebtedness at Trait Level

Both gratitude and indebtedness were treated as affective traits in this study. How gratitude was connected with subjective well-being and with prosociality was reviewed. In addition, how indebtedness was linked to subjective-welling and with prosociality was also explored. Hypotheses of differential associations were then formulated.

3.4.1 Gratitude and subjective well-being

Gratitude has been linked to subjective well-being. Subjective well-being is defined as “a global assessment of a person’s quality of life according to his own chosen criteria” (Shin & Johnson, 1978, p. 478). Diener, in his seminal review (1984), has categorized various definitions of well-being into three groups: Well-being which is defined by external criteria such as virtue; defined by subjective evaluation of life satisfaction; and defined in terms of positive and negative affect. The criterion for happiness of the first group does not pertain to subjective judgment, but the value framework. Yet the latter two groups of definitions rely on the standards of what a good life is according to one’s own personal experiences and received much more empirical attentions. Diener (1984) found considerable empirical evidence to support a tripartite model of subjective well-being, referring to a cognitive aspect of life satisfaction, and an affective aspect encompassing the presence of positive affect and the absence of negative affect (Chan, 2009). Put it simply, a person having heightened subjective well-being evaluates his or her life as highly satisfying and reports as experiencing more positive affect and less negative affect generally.

Given the positive emotional valence that feeling grateful has, one may speculate that disposition toward gratitude might imply the basic tendency of experiencing positive

emotions. Watkins (2004) proposed five possible mechanisms to explain why gratitude can contribute to one's subjective well-being: Grateful people gain additional emotional advantages from a benefit when it is perceived to be a gift; grateful people may be less likely to take benefits for granted thus going against the law of habituation to positive affect; gratitude directs people's attention away from upward social comparison which lead to the feeling of deprivation; gratitude as a resource to mood repair following stressful situations may facilitate people to cope more effectively; gratitude promote the accessibility and recollection of pleasant life events.

Some empirical evidence has been gleaned for the speculated functions of gratitude. McCullough and his colleagues (2002) have found that gratitude disposition was positively correlated with life satisfaction, positive affectivity, and other measures such as vitality, optimism, hope, and subjective happiness but negatively correlated with the measures of negative affect (i.e., negative affectivity, anxiety, and depression). Especially noteworthy is that their findings were consistent for both self-ratings and observer-ratings of gratitude trait and in both student and non-student samples. Watkins and his colleagues found that scores on GRAT correlated positively with internal locus of control and intrinsic religiosity and negatively with narcissism and hostility (Watkins et al., 1998). They also found that gratitude trait was positively related with satisfaction with life and negatively with depression (Watkins et al., 2003). More grateful participants also showed a positive memory bias in their experiment (Watkins et al, 1998). Adler and Fagley (2005) reported positive and significant correlations between the AS scores and life satisfaction as well as positive affect. Research focused on character traits also undergirded the findings that along with other positive traits (love, hope, curiosity, and zest), gratitude

often was found to correlate quite highly with well-being measured in various ways (Park & Peterson, 2006a, 2006b; Park et al., 2004). Further evidence beyond simple correlations is also available through several pioneering intervention studies. Emmons and McCullough (2003) had the participants keep weekly or daily journal pertaining to five things that they are grateful for in their own experiences for 9 weeks or 13 days. They found that compared with those writing five hassles (negative condition) or life events (neutral condition), participants who kept gratitude journal exhibited heightened general life satisfaction and more experiences of positive affect. Again, the results persist among both students and patients with neuromuscular disease and for both college (Emmons & McCullough, 2003) and late primary to early secondary school students aged 11 to 13 years old (Froh, Sefick, & Emmons, 2008).

3.4.2 Indebtedness and subjective well-being

Psychological state of indebtedness is rarely regarded as positive as gratitude. Those who are indebted are often described as having a negative reaction to helping behavior. As Hobbes stated: "To have received from one, to whom we think ourselves equal, greater benefits than there is hope to requite, disposeth to counterfeit love; but really secret hatred; and puts a man into the estate of desperate debtor" (cited in Greenberg, 1980, p.17). Indebtedness might involve negative feelings and even resentment toward benefactor (Gergen, Ellsworth, Maslach, & Seipel, 1975). As reviewed in 3.2.3, recent research also consistently depicted indebtedness as a negative and aversive emotional experience (Buunk, et al., 1993; Greenberg et al., 1982; Naito et al., 2005; Watkins et al., 2006). Therefore, those individuals who have the propensity to experience feeling of

indebtedness might have the tendency to be less satisfied with what they have and therefore are more prone to feelings of regret, worry, and frustration.

Mathews and Green (2009) provided an alternative explanation for why indebted individuals might have a negative profile of personal well-being. They found that indebtedness was associated with high self-focused attention, i.e., unlike grateful individuals who recognize and acknowledge other's benevolence, indebted ones focus their attention on their own concern of equity by repayment (Mathews & Green, 2009). Being prone to focus on self, an indebted individual often fails to empathize accurately to the good intention of the benefactor, concerns more of the obligation to repay, and perceives the relationship with the benefactor as more exchanged-based, thus leading to higher level of social anxiety and less awareness of social support (Mathews & Green, 2009).

However, indebtedness clearly has its upside. Indebtedness exerts its own social function by possibly prompting a more frequent pattern of exchange (Schaumberg & Flynn, 2009). Schaumberg and Flynn (2009) pointed out that "regardless of whether they are based on feelings of indebtedness or gratitude, sustained patterns of exchange involve greater perceptions of shared responsibility, or 'jointness' of contributions, which facilitate feelings of cohesion" (p. 111). However, as they added, the degree of cohesion inspired by the two feelings may not be equally strong even if the support for the association between feeling of indebtedness and cohesion can be found (Schaumberg & Flynn, 2009).

Based on the above review, dispositional gratitude was hypothesized to be positively related to cognitive evaluation of subjective well-being and more positive affect but

negatively related to negative affect. However, dispositional indebtedness was hypothesized to be negatively related to subjective well-being indicating low life satisfaction, low degree of positive affect and high degree of negative affect.

3.4.3 Gratitude and prosociality

Lazarus and Lazarus (1994) have named gratitude “empathic emotion” because gratitude is grounded on the human capacity of empathizing with others. Gratitude derives from the empathic recognition of the beneficial actions of other people. In other word, people experience gratitude when they empathize with the benefactor’s kindness and expenditure of efforts. Adam Smith, in *The Theory of Moral Sentiments* (1790/2000), wrote that gratitude is the sentiment which “most immediately and directly prompts us to reward”. Smith’s theoretical propositions of mutual sympathy and impartial spectator lend cogent support for explaining gratitude as one of the primary motivators of benevolent behaviors toward benefactor. In light of Smith (1790/2000)’s treatise, McCullough and his colleagues (2001) pointed out that gratitude is morally relevant by theorizing gratitude as a moral affect. Gratitude is a moral affect in terms of its functioning as moral barometer, reading out the degree to which one appreciates other’s benevolence; as moral motivator, motivating one to find ways to take actions for the giver’s well-being; and as moral reinforcer, encouraging the one who offered continues to offer in the future (McCullough et al., 2001). Later, McCullough and Tsang (2004) added more clarity to elucidate gratitude as a prosocial affect to accommodate some exceptional cases in which gratitude is prosocial in nature but immoral in an absolute sense.

Considerable evidence has been gleaned to support the three functions of grateful emotion as barometer, motivator, and reinforcer (see McCullough et al, 2001 and

McCullough and Tsang, 2004 for details). In addition, gratitude as a dispositional trait has been linked to prosocial traits and behaviors. McCullough and his colleagues (2002) found that dispositional gratitude measured by GQ-6 was positively correlated with self-reported forgiveness and negatively correlated with envy. The self-report and informant-report measures of the grateful disposition correlated positively with the Empathic Concern and Perspective-Taking subscales of the empathy measure. Moreover, grateful disposition was correlated positively with informants' reports of participants' prosocial behaviors. More grateful participants by both self- and informant-rating reported to perform more prosocial behaviors such as providing favors as well as emotional and tangible support than less grateful ones. In addition, informants rated grateful participants as having more prosocial traits generally than did the informants of less grateful people.

3.4.4 Indebtedness and prosociality

Indebtedness is connected with prosociality because it also propels people to reciprocate and act prosocially toward their benefactors. Greenberg (1980) introduced one important way to reduce indebtedness, which is reciprocation. Through reciprocation, indebtedness seems to be positively associated with prosociality. However, reciprocation is only one form of prosocial behaviors. The positive associations between indebtedness and prosocial traits and behaviors are not warranted.

There is no empirical evidence available on the association between indebtedness trait and prosociality. However, a few studies investigated the association treating indebtedness as an emotion might provide some indications. Watkins and his colleagues (Watkins, et al., 2006) found that indebtedness tended to be associated with broad prosocial thought/action tendencies much weaker than gratitude, and obligation was

associated with an increased likelihood of experiencing some antisocial tendencies. Naito and Tani (2005) found that feelings of indebtedness (a composite variable consisting of shame, regret, uneasiness, and indebtedness) were not related to the increased prosocial motivation for Thailand students and Japanese female students, and were only slightly associated with increased prosocial motivation for Japanese males. The above evidence suggests that feeling of indebtedness does not necessarily relate to prosocial motivation. In addition, feeling indebted was related to withdrawal in requesting and receiving help. Greenberg and Shapiro (1971) conducted an interesting experiment alleged to test the performance of physical disabled workers and found that students who anticipated being unable to return a favor were less willing to ask for and receive needed help than students who anticipated being able to reciprocate. In sum, the above studies at least indicated that dispositional indebted individuals would differ from dispositional grateful ones in their prosocial motivations.

3.4.5 Hypothesized differential associations with helping tendencies

The relevant literature suggests that gratitude is positively related to prosocial traits, inclinations, behaviors, and reciprocation. However, the association between indebtedness and prosociality is not clear. Like gratitude, indebtedness promotes the repayment of received favors; whereas unlike gratitude, indebtedness does not reliably and consistently relate to prosocial action tendencies and motivations. In consideration of gratitude and indebtedness as dispositional traits, this study aimed to fill the gap by investigating whether they would be differentially relate to helping tendencies. Comparing with helping behaviors, investigating helping tendencies has at least two advantages. First, reporting the tendency to initiate helping behaviors involve less degree

of social desirability. Low helping tendency does not necessarily mean low degree of prosocial behaviors because some people are more used to act upon other's request for help. Second, helping tendency may be the most promising candidate in differentiating gratitude and indebtedness traits. Since indebtedness makes one less willing to ask and receive needed help, we may speculate that one would also be less willing to initiate or go out of his or her way to offer help to others. Therefore, in the present study, dispositional gratitude was hypothesized to be positively related to helping tendencies, whereas indebtedness was hypothesized to be negatively related to helping tendencies.

3.5 Gratitude and Indebtedness at Emotion Level

Given a more thorough understanding of the difference between gratitude and indebtedness at the trait level, it is of great significance to further investigate in what way gratitude and indebtedness as emotional states were different and how they could be elicited by different set of conditions or factors.

3.5.1 Emotional valence

Gratitude and indebtedness were found to have different emotional valence in recent studies. Gratitude was found to be a pleasant emotion but indebtedness had negative affective associations. Naito, Wangwan, and Tani (2005) investigated feelings evoked by a favor and found that for both Japanese and Thai college students, thankfulness loaded strongly on the positive affect factor, but indebtedness loaded strongly on the negative affect factor along with "shame", "regret", and "uneasiness". Watkins and his colleagues (2006) concluded that gratitude should be viewed as a positive affect but indebtedness has mixed affective associations. Specifically, their correlational analysis of emotional

responses among undergraduate students revealed that feeling grateful was positively correlated with “happy”, “contented”, “fortunate”, and “pride” and negatively correlated with “resentment”, “annoyance”, and “uneasy”; however, feeling indebted was positively correlated with both “happy” and “flustered” and feeling obligated was associated with “guilty”, “flustered”, and “uneasy”. It seems that feeling grateful was positive, but feeling indebted appeared to be a mixed affective state, and feeling of being obligated was primarily correlated with negative affective states.

The present study permitted two definitions of indebtedness, feeling owing others and feeling obliged to repay. Are feeling thankful, owing others, obliged to repay perceived or felt as having different emotional valence among Chinese young adolescents? Prior to investigating the disassociation of the three feelings by other factors, particularly important is to find out how the three are actually felt in response to some situations among the Chinese young people.

3.5.2 Expectation to return

Using scenarios and life-experience-recall methods in three studies, Tsang (2006b) consistently found that participants' felt gratitude vary as a function of helper intention. Specifically, participants felt significantly more grateful when perceiving helper intention as altruistic than as selfish. However, their reaction of feeling indebted was not significantly influenced by helper intention as benevolent or selfish. Across her three studies, Tsang (2006b) created a measure of gratitude by combining participant ratings of grateful, thankful, and appreciative ($\alpha = .85$ to $.96$ in 3 studies) and a measure of indebtedness by combining ratings of indebted and obligated ($\alpha = .64$ to $.72$) indicating that participants perceived feeling indebted and feel obligated as similar yet somewhat

different. Watkins, Scheer, Ovnicek, and Kolts (2006), inspired by Heider (1958), manipulated benefactor expectations for repayment in two scenarios and found that as expectations to return increased, participants reported lower levels of gratitude and higher levels of indebtedness. Watkins and his colleagues (2006) defined indebtedness as “feeling obligated to repay” in their study 1 and “feeling like owing” in study 2 and obtained consistent results.

Note that helping out of selfish intention can include instrumental help with expectation for repayment. For instance, selfish intentions can involve expectation for repayment such as “your friend is doing you this favor in order to borrow your car next weekend” (p.201; Study 1 in Tsang, 2006b) or “a friend bought her groceries in order to appear generous to her roommate” (p. 202; Study 2 in Tsang, 2006b). Therefore, using different terms, Tsang (2006b) and Watkins et al. (2006) seemed to study the feelings of gratitude and indebtedness under similar conditions: altruistic vs. instrumental help. They obtained similar results concerning gratitude, which is feeling of gratitude increased when recipients perceived the help as a sign of positive regard (no return favor was expected) than manipulative intentions. However, their results pertaining to feeling of indebtedness were somewhat different. Tsang found that indebtedness was slightly lower in the condition of selfish intention than altruistic intention. However, Watkins and his colleagues found that with increased expectation of return favor feeling of indebtedness increased. In other words, the more recipients perceived their helper as having instrumental intentions, the more they felt indebted or obliged to repay.

Although gratitude and indebtedness can be disassociated as a function of helper expectation among western adults, it is not known whether or not different benefactor

expectation for repayment can disassociate feeling thankful, owing others, and obliged to repay in Chinese cultural context and for younger populations. The mixed results of different change pattern of gratitude and indebtedness as a function of expectation to return also suggested a need for further investigation.

3.5.3 Help initiation

One other possible candidate for dissociating gratitude and indebtedness is the locus of help initiation. The emotional reactions to receiving unsolicited help might be different from the emotional reactions to receiving solicited help. Greenberg and Saxe (1975) found that a beneficiary experienced more indebtedness when they requested for a benefit than a benefactor offered unsolicited help. They used 10-point Likert scale to measure indebtedness from “not obligated” to “highly obligated”. They did not include gratitude in their study but gratitude responses to help initiation might reveal a different pattern.

People are more likely to feel indebted in response to receiving solicited help, which the locus of help initiation is on the help recipient. Individual who asks for help is responsible for the cost incurred on the helper’s side. In comparison, when an individual receives unsolicited help, the one who helped him or her is responsible for the costs incurred. Moreover, when people ask for help, the target person may agree to help because it is socially awkward to refuse others (Flynn & Lake, 2008). Help seekers may feel guilty for putting the target into discomfoting position, and once they receive help, work hard to repay to alleviate the feelings of guilt (e.g., Walster, Berscheid, & Waslter, 1973). The guilty feelings with a desire to reciprocate may lead the one who requests for help to experience a sense of indebtedness.

Unsolicited acts of helping may lead to more feelings of gratitude. Greenberg and Frisch (1972) showed that liking for a helper increased when helping was seen as deliberate rather than accidental. For help recipients, unsolicited help may seem more deliberate because helpers have taken initiation to help. People may therefore feel more grateful to those who have provided unsolicited help because the help was given proactively rather than reactively. In addition, unsolicited help may reflect the benefactor's attention for the recipient's needs and wishes. Tesser et al. (1968) demonstrated that feelings of gratitude were predicted by the perceived motives of the benefactor. Help recipients who felt that helpers were motivated to address the help recipient's pressing need (i.e., a communal orientation) reported higher levels of gratitude. Given its strong association with communal norms (Mills & Clark, 1994), unsolicited help may be more likely to elicit feelings of gratitude.

However, cost seems to be associated with both gratitude and indebtedness in the literature. Tesser and his colleagues (1968) found that cost significantly predicted feelings of gratitude which was the composite variable adding the emotional responses of both gratitude and indebtedness. Naito and his colleagues (2005) found that cost was significantly associated with both grateful and indebted feelings, although stronger with the latter. Given gratitude and indebtedness' similar degree of sensitivity to cost, it is also possible that once salient costs happen in social situations, people respond with similar level of gratitude and indebtedness regardless of who is responsible for the costs.

3.5.4 Effect of reciprocation

Gratitude and indebtedness might also show different patterns of response following reciprocity behavior. In other words, the effect of reciprocation on these two

psychological states might be dissimilar with each other. If gratitude and indebtedness are distinct affects, feeling of indebtedness would dissipate but feeling of gratitude would remain, once the reciprocation has been fulfilled.

Reciprocation should reduce feelings of indebtedness given that the act of providing help will lessen the perceived inequity between the helper and the help recipient. Reciprocation allows people to feel more degree of freedom, thereby reducing their state of anxiety and obligation. Feelings of gratitude will not necessarily decrease after a help recipient has provided reciprocation. Helping behavior tends to activate positive rather than negative emotions (Bartlett & DeSteno, 2006). Given that positive emotions often coincide and have broaden-and-build effect (Fredrickson, 1998), gratitude would likely increase, or at least not decrease after reciprocation. Further, feelings of gratitude do not refer to an inequity between two exchange partners. Rather, grateful feelings often refer to the recognition and acknowledgement of the experience of being helped. An act of reciprocation would not alter the positive feelings that arose after an individual receives help. Therefore, unlike indebtedness, feelings of gratitude may not be diminished by acts of reciprocation.

To summarize, the literature suggested some ways to disassociate gratitude and indebtedness at emotion level. However, it is not known whether or not these factors can contribute to disassociation between gratitude and indebtedness among younger population and in a different culture. Therefore, the present study was designed to investigate both positive and negative affective associations of feeling thankful, owing others, and obliged to repay among Chinese young adolescents, followed by examination of the effects of expectation to return, helping initiation, and reciprocation.

3.6 Trait-Emotion Relationship

3.6.1 Correlations among emotions

Tesser et al. (1968) provided the earliest high correlation between gratitude and indebtedness as two emotional responses to various scenarios. Later research demonstrated that the correlations between the two range from not significant to substantially and significantly positive. Tsang (2006b) found that gratitude and indebtedness in response to a scenario (one gets \$200 to buy books from a friend) were not significantly correlated across conditions or between conditions of different helper intention ranging from .00 to .10. When asked to recall actual favors, participants reported gratitude and indebtedness were positively correlated with the correlation coefficients ranging from .20 to .61. Watkins and his colleagues (2006) found that in the situation where one was offered help from a friend to move to a new apartment the responses of gratitude and indebtedness were not found to be reliably associated ($r = .16$, $p > .05$), but they did correlated significantly ($r = .25$) in the situation where one was provided notes by classmates for missing class. A behavioral test of distribution raffle tickets showed high correlation between the two ($r = .71$) after getting nearly all tickets either by favor or by chance (Tsang, 2007).

So it seems that the interaction between gratitude and indebtedness vary differently in different social situations. However, it is unclear in what situations gratitude and indebtedness tend to covary and in what situations they tend to change more independently. It is unknown whether some other factors might explain high correlations observed in some situations. With this in mind, the present study addressed the problem by introducing different situations and measuring the elicited positive and negative

emotions in addition to feeling thankful, owing others, and obliged to repay in the situations to find out the interactions among them.

3.6.2 Threshold-setting effect

According to Rosenberg (1998), the organizational impact primarily follows a pattern of flow from affective traits down to the emotions. This is the major basis for the ordering in the hierarchy. Affective traits are stable predispositions toward certain types of emotional responding. Several theorists from a wide range of theoretical orientations have suggested that affective traits set the threshold for the occurrence of particular emotional states (Ekman, 1984; Lazarus, 1982; Ortony, Clore, & Collins, 1988). According to the threshold-setting proposition, dispositional gratitude should set the threshold for the occurrence of grateful feelings and dispositional indebtedness set the threshold for feeling owing others or obliged to repay across situations. In other words, given the same stimulus, grateful people would feel more thankful while people who score high in dispositional indebtedness would report more feeling of owing others or obligation to repay.

Moreover, Rosenberg (1998) argued that there is specificity in the threshold-setting function of affective traits, which indicates that a particular trait would predispose someone to emotions that are congruent with that trait and not to trait-incongruent emotions. For instance, a more hostile person is more easily provoked to feel anger but not necessarily primed for feeling fear or negative emotions in general. Gratitude and indebtedness might be related to each other in some way, therefore more grateful person would have a lower threshold to elicitations such as in benefit-receiving situations than

those who are less grateful, but trait gratitude may or may not have effect on feeling indebted and vice versa.

Watkins and his colleagues (2006) have provided some initial evidence on the influence of trait gratitude on elicitation of emotional gratitude. Using both GQ-6 and GRAT as the measures of dispositional gratitude, they found that grateful disposition measured by GRAT was significantly related to felt gratitude ($r = .20$) but the result failed to reach significance when measured by GQ-6 ($r = .14$).

No study has been conducted to examine the association of dispositional gratitude and indebtedness with their corresponding emotional states, so one of the purpose of the present study was to find out the trait-emotion correlations of gratitude and indebtedness and investigate whether or not gratitude or indebtedness disposition had association only with its corresponding feeling(s).

Rosenberg (1989) provided an in-depth analysis of affective trait-emotion relationship in the three-level analysis of affect, indicating that affective trait exerts its organizational influence at the various stages of the emotion processes encompassing appraisal and emotional response from subjective experience to expression. For instance, the literature suggests that at appraisal stage the threshold-setting functions of affective traits are particularly noticeable. Dodge's series of studies (Dodge, 1980; Dodge & Coie, 1987; Dodge & Frame, 1982) delineated the social-cognitive processes underlying aggressive behavior in children. When exposed to provocative social situation of ambiguous content, aggressive boys are more likely to exhibit hostile attributional biases than nonaggressive boys (Dodge, 1980). Specifically, aggressive boys interpret an ambiguous social situation, which could potentially be interpreted as stemming from

either benign or hostile intentions, as implying hostile intentions. Dodge's studies are particularly compelling because they utilized ambiguous social situations which are not necessarily interpreted in an anger-provoking manner. Those less aggressive boys did not attribute hostile intention in the same ambiguous situation. Tsang (2006b) also involved ambiguous condition in her experiment to investigate the effects of helper intention on gratitude and indebtedness. She presented a favor scenario in which the helper has ambiguous intentions, allowing participants to make their own attributions of helper intention. She found that participants react with more gratitude when they attributed benevolent intentions to the benefactor and less gratitude when they attributed ulterior motives to the benefactor and that indebtedness was not sensitive to perceived helper intention. However, Tsang did not involve dispositional gratitude in her study.

In order to show a connection between affective traits, emotions, and subsequent prosocial motivation and reciprocal behaviors, the present study utilized ambiguous scenarios to facilitate the clear demonstration of affective trait-emotion relationship through appraisal process. For instance, participants were presented with ambiguous scenarios which allow them to attribute whether the benefactor expected them to return the favor. Ambiguous scenarios would be particularly helpful to detect how dispositional gratitude or indebtedness influences the corresponding emotional states through appraisal.

3.6.3 Prosocial motivation and the magnitude of reciprocation

There is an accumulating body of evidence indicating that a strong connection between gratitude and prosociality, suggesting that gratitude could play the role of "moral motivator" in social life that leads individuals to live a good social life (e.g., McCullough et al., 2002; Tsang, 2006a; Watkins et al., 2006). Among the evidence, some studies were

conducted by treating gratitude as dispositional trait (e.g., McCullough et al., 2002). Others manipulated emotional state of gratitude in a laboratory setting or by scenarios (e.g., Tsang, 2006a, 2006b). Very scarce can we find studies that seek to understand how dispositional gratitude and emotional responses of gratitude influence prosocial behaviors in social situations. It is also not clear whether or not dispositional gratitude would possibly exert more impact on prosocial consequences in ambiguous social conditions where allow individuals to make their own attributions or appraisals in accordance to their dispositional trait.

Watkins and his colleagues (2006) found that with increasing expectations communicated by a benefactor, beneficiaries reported the lower likelihood to help the benefactor in the future. Naito, Wangwan, and Tani (2005) measured both requital behaviors and prosocial motivation in their study aiming to find cultural difference of gratitude between Japanese and Thailand participants. Requital behaviors consisted of two types: "verbal-facial expression" including facial, oral, and written expressions and "giving" including giving money, goods, and invitation for dinner. Prosocial motivation was measured by the willingness to help the benefactor or others in the future. Results indicated that across two samples gratitude predicted two types of requital behaviors and prosocial motivation; whereas feeling of indebtedness predicted only requital behaviors expressed by "giving". Their study suggested that gratitude was associated with prosocial motivation and both gratitude and indebtedness were associated with reciprocal behavior represented by giving something in return. Greenberg and Frisch (1972) manipulated deliberate or accidental help in their experiment to investigate the effect of the two conditions of help intentionality on reciprocation. They found that participants offered

more help in a behavioral measure under the condition of deliberate help than accidental help. Under the condition of deliberate help, a separate group of participants reported higher degree of felt indebtedness, suggesting that feeling of indebtedness could elicit more reciprocation.

The above literature suggests a need to separately investigate prosocial motivation and reciprocation which were not clearly differentiated in past research. In the present study, prosocial motivation was defined as the willingness to take prosocial behaviors in the future. The magnitude of reciprocation was how much the individual went about repaying in a situation given the chance of repayment.

Accordingly, the present study investigated under different conditions of expectation to return and of help initiation, how gratitude as dispositional trait and emotional state would affect prosocial motivation and the magnitude of reciprocal behaviors. In addition, indebtedness as disposition and as emotions was also included to further investigate the possible differential impact.

Chapter 4 Research Framework and Design of the Study

On the basis of the literature review, the present study extended the knowledge and past findings on gratitude and indebtedness from non-Chinese populations to Chinese young adolescents in Hong Kong. With the perspective that gratitude and indebtedness should be investigated at both affective trait and state levels, the present study was designed to examine whether or not gratitude and indebtedness can be distinguished as separate traits and emotions, and to understand the trait-emotion relationships.

4.1 Research Questions

In line with the overall research objectives of the study, main research questions were formulated. The first research objective was to investigate the relationship of gratitude and indebtedness at the trait level. Gratitude has been conceptualized as a dispositional trait and it has been associated with well-being, prosocial behaviors and traits, and religiousness (McCullough et al., 2002). However, no research endeavor has been made to conceptualize indebtedness at trait level and to investigate the characteristics of indebted people in terms of their personal and relational well-being. Therefore, the first main objective was elaborated in the following two questions for analysis.

I. Gratitude and indebtedness as affective traits:

Are gratitude and indebtedness empirically distinguishable as two affective traits?

How are they differentially related to subjective well-being and helping tendencies?

The second main objective of the study was to investigate whether or not gratitude and indebtedness can be disassociated at the emotion level. Gratitude and indebtedness were found to have opposite emotional valence. However, whether they are perceived as

different among younger population and in Chinese context is not clear. In addition, whether the emotional valence varies in accordance to different situations is also unclear. Therefore, the present study introduced some specific situations to examine the question in details. The literature also suggested the possible disassociation of gratitude and indebtedness under the different conditions of benefactor expectation for repayment and of help initiation (Watkins et al., 2006; Greenberg & Saxe, 1975). Moreover, there are sound reasons to propose that gratitude and indebtedness would change differently after the completion of reciprocal behaviors. Accordingly, Chinese young adolescents in Hong Kong were chosen as target population for investigation of the above possible disassociations between gratitude and indebtedness. Specifically, at the level of emotion, research questions were formulated as follows.

II. Gratitude and indebtedness as emotions:

Do feeling thankful, feeling owing others, and feeling obliged to repay have different emotional valence?

Can different conditions of expectation to return and of help initiation disassociate feeling thankful, feeling owing others, and feeling obliged to repay?

Does feeling thankful remain the same but feeling owing others decrease after the completion of reciprocation?

Addressing the research objective of understanding trait-emotion relationship, the specific research questions were elaborated as follows.

III. Trait-emotion relationships:

How do feeling thankful, feeling owing others, and feeling obliged to repay correlate with each other?

How do dispositional gratitude and indebtedness correlate with feeling thankful, feeling owing others, and feeling obliged to repay?

How do dispositions and emotions of gratitude and indebtedness affect prosocial motivation and the magnitude of reciprocation?

4.2 Design of the Study

The present study adopted a quantitative approach with two levels of analysis to provide answers for the above research questions. Figure 4.1 presents the organization of the study and summarizes the research questions for Study 1, Study 2a, and Study 2b. Study 1 treated gratitude and indebtedness at trait level. Study 2a and Study 2b treated gratitude and indebtedness at emotion level.

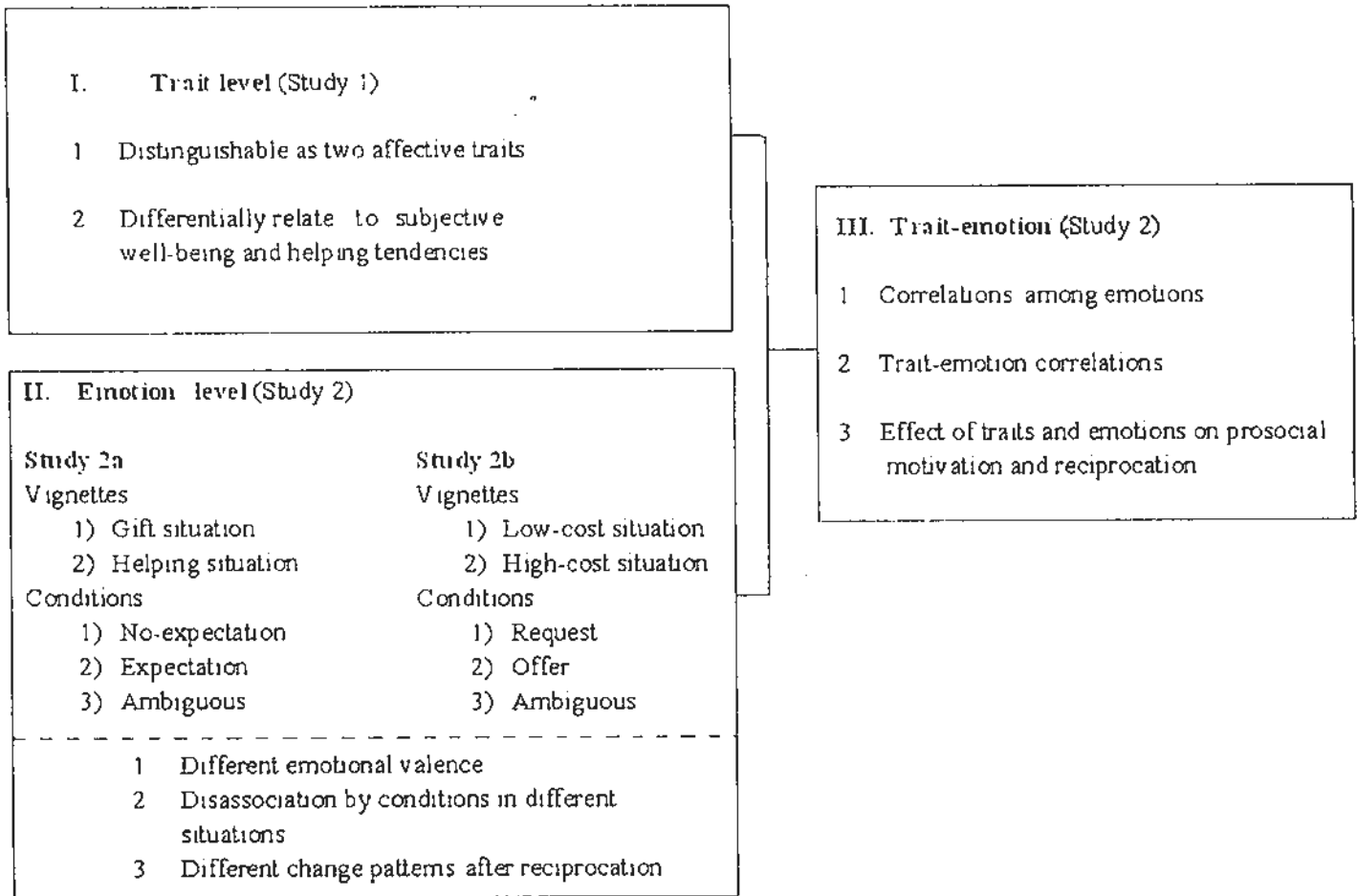
At the trait level, the analyses focused on the item responses of local Chinese young adolescents to the gratitude and indebtedness measure, examined whether or not gratitude and indebtedness were perceived as two dimensions or structural components through both exploratory and confirmatory factor analysis. Students' item responses to subjective well-being and helping tendencies were also collected and both gratitude and indebtedness were then regressed on subjective well-being and helping tendencies to find out the possible differential predictions.

At the emotion level, the analyses focused on emotional responses of feeling thankful, feeling owing others, and feeling obliged to repay elicited by different scenarios and under different conditions. Study 2a included two vignettes that are familiar and natural for Chinese young adolescents in Hong Kong. One vignette describes a situation of receiving a birthday gift and another describes a situation of receiving other's help. Study 2b designed two vignettes that involved benefactor's salient costs at the consideration

that cost should be the central concern of help initiation. Study 2a manipulated three different conditions of expectation to return (No-expectation condition, Expectation condition, and Ambiguous condition) and Study 2b manipulated three different conditions of help initiation (Request condition, Offer condition, and Ambiguous condition) through different description in vignettes. The ambiguous conditions were especially designed to facilitate the examination of trait influences on emotions. Correlational analyses were conducted to find out whether or not feeling thankful, owing others, and obliged to repay had different associations with other positive and negative emotional responses elicited by vignettes. Analysis of variance was conducted for examining the effect of experimental conditions on the three feelings.

In connecting trait and emotions in Study 2, the analyses focused on how feeling thankful, owing others, and obliged to repay correlated with each other and the trait-emotion correlations of gratitude and of indebtedness. By separately measuring prosocial motivation and reciprocation, the study investigated how traits and emotions of gratitude and indebtedness affected prosocial motivation and reciprocation differentially by conducting a series of multiple regression analysis.

Figure 4.1 Organization of the study and summarization of research questions



Chapter 5 Study One: Gratitude and Indebtedness as Affective Traits

Study 1 aimed to investigate whether or not gratitude and indebtedness can be empirically distinguished as two affective traits and explore whether each of the two constructs was associated with subjective well-being and helping tendencies in a different way. Specifically, Study 1 investigated how dispositional gratitude and indebtedness would be differentially associated with subjective well-being measured by cognitive judgment of satisfaction with life and affective components of positive and negative affects, and how they can differentially predict helping tendencies.

5.1 Method

5.1.1 Participants

Two independent groups of participants were used in Study 1. Sample A comprised 381 upper primary and lower secondary students in Hong Kong. They were above average ability students nominated by their school teachers mainly based on their good performance in school subjects to join the gifted programs in the Chinese University of Hong Kong. Sample B comprised 249 upper primary and lower secondary students who were from the same programs at a different period of time, thus having similar level of above average abilities. Sample A was employed for conducting exploratory factor analysis on the item responses of dispositional gratitude and indebtedness. Sample B was employed for confirmatory factor analysis based on the result of factor structure of Sample A. The demographic characteristics of the two samples are summarized in Table 5.1.

Table 5.1 The demographic characteristics of sample A ($N = 381$) and sample B ($N = 249$)

	Sample A ($N = 381$)			Sample B ($N = 249$)		
	Male	Female	Total (%)	Male	Female	Total (%)
Gender	207	174	381	148	101	249
Age						
9	1	0	1 (0.3%)	10	4	14 (5.6%)
10	36	27	63 (16.8%)	38	32	70 (28.1%)
11	39	39	78 (20.5%)	41	36	77 (30.9%)
12	41	30	71 (18.6%)	15	8	23 (9.2%)
13	37	21	58 (15.2%)	21	3	24 (9.6%)
14	34	32	66 (17.3%)	13	10	23 (9.2%)
15	19	25	44 (11.5%)	10	8	18 (7.2%)
Mean	12.23	12.39	12.30	11.53	11.36	11.46
SD	1.60	1.69	1.64	1.68	1.65	1.67
Grade						
5	50	48	98 (25.7%)	43	33	76 (30.5%)
6	53	31	84 (22.0%)	47	40	87 (34.9%)
7	29	25	54 (14.2%)	12	7	19 (7.6%)
8	39	31	70 (18.4%)	21	2	23 (9.2%)
9	30	34	64 (16.8%)	13	9	22 (8.8%)
10	6	5	11 (2.9%)	12	10	22 (8.8%)
From No. of Schools	110	78	158	88	53	126

From Table 5.1, it can be seen that Sample A included 207 boys (54.3%) and 174 girls (45.7%) and Sample B included 148 boys (59.4%) and 101 girls (41.6%), with both samples having more boys than girls. Both samples were at the same range of ages and grades, between the ages of 9 to 15, and from Primary 5 to Secondary 4. It can be seen that Sample A students were slightly older ($M=12.30$, $SD=1.64$) than Sample B students ($M=11.46$, $SD=1.67$). Different ages of students were more evenly distributed in Sample A (11.5% to 20.5% from age 10 to 15) than Sample B (over half of students were at age 10 and 11: 28.1% at 10 and 30.9% at 11). The 381 participants in Sample A were from 158 schools and the 249 participants in Sample B were from 126 schools. These students in both samples were relatively heterogeneous with respect to school distributions.

Despite the slight differences, the two samples could be regarded as similar and comparable in terms of age, gender, and grade.

5.1.2 Measures

Gratitude and Indebtedness Questionnaire-12 (GIQ-12). On the basis of Gratitude Questionnaire-6 (GQ-6; McCullough, Emmons, & Tsang, 2002), GIQ-12 was formulated as the extension of GQ-6 to examine whether participants perceive gratitude and indebtedness differently. GQ-6 is a 6-item short questionnaire measuring four different facets of grateful disposition that include intensity, frequency, span or the variety of life aspects, and density or the number of persons. One sample item is "I have so much in life to be thankful for". GQ-6 has excellent psychometric properties including a robust one-factor structure and high internal consistency (Cronbach's $\alpha = .82$, McCullough et al., 2002). It has also been widely used and proven to be a reliable and valid instrument to assess dispositional gratitude (e.g., in Kashdan et al., 2006; Watkins et al., 2006; Wood et al., 2007). GQ-6 has been used in Chinese Taiwan context with some revisions to measure athletes' gratitude trait and was found to be reliable (Cronbach's $\alpha = .78$, Chen & Kee, 2008). Six items were especially written as the extension of GQ-6 for this study. The six items were formulated in equivalent pattern with those of GQ-6. In other words, the sentence structure and meaning of each item were exactly parallel to that in GQ-6. This special equivalence was made on the basis of acknowledging the credibility of the GQ-6 and with the consideration to measure the same four facets (i.e., how intensely and frequently as well as how widely in terms of situations and persons) people experience indebtedness in life. In addition, the equivalence excluded possible ambiguities in expression and facilitated the investigation of whether or not indebtedness as a trait was

perceived as essentially distinct from gratitude. Especially for the purpose of study 1, the GIQ-12 was translated into Chinese and the Chinese version was then back-translated into English by the second translator. The equivalence in meaning and appropriateness in language usage were carefully considered. In completing the 12 items, participants were requested to indicate their judgment whether the statement in each item was descriptive of him or her on a five-point scale ranging from 1 (*least like me*) to 5 (*most like me*).

In order to make sure young adolescents could comprehend and make meaning out of the items which were designed to measure indebtedness, interviews were conducted among ten young adolescents (five boys and five girls) aged from 9 to 11. They were at primary grade 5 or 6 in different schools, seven from local schools and three from international schools, and they attended the same church on Sundays. The interviews were conducted individually in Chinese. Indebtedness was printed in font size 24 and in traditional Chinese “虧欠” (indebtedness). The participants were simply asked to read the word aloud and explain the meaning of it. All of them were able to read “虧欠” correctly. In explaining the meaning of the word, eight children simply responded with “owe others” and two provided examples “others helped me but I have not yet returned”. When probed further with the question “What do you think one can possibly owe others?” They responded with “money”, “favors”, “Qing (情; affection or sentiment)”, “something like a present”. One child replied “because others treat you so well that you feel sorry for not showing enough kindness”. Two out of the ten showed somewhat difficulties in explaining the meaning demonstrated by longer pause or lack of fluency. After participants’ explanation of the meaning, they were presented the six items of indebtedness in the questionnaire and asked to rate from 1 to 5. All children demonstrated

ease of rating. Further explanation requirements revealed that three children have difficulties in understanding the reversed items and all can appropriately understand the other items. Although having slight differences in understanding, the results indicated that participants can appropriately understand the essential meaning of indebtedness as the state of owing others and obligation to repay as the study assumed.

Satisfaction with Life Scale (SWLS). The five-item SWLS (Diener, Emmons, Larsen, & Griffin, 1985) assesses general life satisfaction as the cognitive aspect of subjective well-being. It reveals the individual's own judgment of his or her quality of life. The scale has demonstrated high internal consistency (Cronbach's $\alpha = .87$), excellent two-month test-retest reliability ($r = .82$), and convergent and discriminant validity with other measures of subjective well-being, independent ratings of life satisfaction, self-esteem, clinical symptoms, neuroticism, and emotionality (Diener et al., 1985; Lucas, Diener, & Suh, 1996; Pavot & Diener, 1993). The Chinese version of SWLS has been used among Hong Kong adolescents by Shek (2000) and reported sound reliability. The Chinese translation of SWLS in Chan (2009) was used for the present study. In completing the scale, participants were requested to indicate to what extent the statement is descriptive of their own judgment on a five-point scale ranging from 1 (*least descriptive of me*) to 5 (*most descriptive of me*). A total score can be obtained by summing the five item responses, with higher scores reflecting more satisfaction with life.

Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) is adopted to assess general affect. PANAS consists of two scales, one on positive affect and one on negative affect. Each scale contains 10 emotion adjectives (e.g., interested, excited, enthusiastic for positive affect; guilty, scared, upset for negative affect)

which are rated to indicate the respondent's general perception of the amount of time spent experiencing each emotion. The two scales were reported to be highly internally consistent (Cronbach's α above .85), largely uncorrelated, and stable at appropriate levels over a two-month time period (Watson et al., 1988). The Chinese translated version in Chan (2009) was adopted in the present study. Participants were asked to make their judgments of experiencing the emotions in general on 5-point Likert-type scales ranging from 1-*not at all* to 5-*extremely*. A total score on positive affect and one on negative affect can be obtained by summing the ratings on the relevant items.

Helping Tendencies Checklist. Five items were especially written for Study 1 to assess how students differ in their helping tendencies. The students were asked to check their helping tendencies in terms of taking initiative in helping, offering emotional support, and the degree of enjoyment while offering helping. For instance, "I will go out of my way to help others" and "I often volunteer to offer assistance to others". In completing the checklist, students were asked to judge their behaviors using five-point Likert-type scale ranging from 1 = *not at all true* to 5 = *exactly true*. A total score can be obtained by summing the five item responses, with higher scores reflecting higher level of helping tendencies.

5.1.3 Procedure

Sample A participants were asked to respond in groups to four self-report scales assembled in one questionnaire. The four scales are GIQ-12, SWLS, PANAS, and Helping Tendencies Checklist. The items of the four scales were randomly rearranged to avoid repetitions and easy detection of research intentions by the participants. Sample B

participants were asked to respond to GIQ-12. The sample items for each of the four scales were included in Appendix A, B, C, and D respectively.

5.2 Results

5.2.1 Factor structure of Gratitude and Indebtedness Questionnaire-12

To address the first research question, i.e., whether gratitude and indebtedness can be empirically distinguished as two separate constructs, exploratory factor analysis on the item responses of the 381 students and confirmatory factor analysis on the item responses of the 249 students were performed respectively. Specifically, the responses ($N = 381$) for the twelve items in GIQ-12 were first intercorrelated, and the resulting 12-item correlation matrix was then subjected to an exploratory maximum likelihood factor analysis. An initial estimation yielded three factors with eigenvalues exceeding one, accounting for 48.84% of the total variance (See Table 5.2). The scree test showed that one or two or three components could be extracted.

Table 5.2 The percentage of variance accounted for by the various factors with Eigenvalues more than 1 in GIQ-12 ($N = 381$)

Factor	Eigenvalues	Percentage of variance	Cumulative percentage
1	2.74	22.81	22.81
2	1.19	15.83	38.64
3	1.22	10.19	48.84

Varimax-rotated factor solutions from one to three were examined for simple structure and interpretability. Table 5.3 shows the one-factor, two-factor, and three-factor solutions of the GIQ-12. The four items of Gratitude trait formed a dominant factor in each of these

three factor solutions. In the two-factor solution, Factor 1 was formed by 4 items of Gratitude trait (items 1, 9, 21, 23) and 1 item of Indebtedness trait (item 14). The four items described gratitude, thankfulness, or appreciation in life. The two reverse items of Gratitude trait (item 16 and 25) did not load saliently on the dimension. The item “feeling obligated to repay as growing older” which was formulated to reflect Indebtedness trait loaded on Factor 1. Factor 2 was formed by 3 items of Indebtedness trait (items 34, 18, 27), all three items describing “feeling owing others”. This suggested that students’ perception of the obligation to repay was different from feeling owing others. And the obligation to repay seemed to be more associated with gratitude than indebtedness. Again, the two reverse items (item 4 and 7) did not load saliently on Factor 2.

In the three-factor solution, in addition to the same two factors emerged as in the two-factor solution, there was the third factor formed by item 25 and item 7 both being reverse items and involving time dimension. It can also be seen that the factor loadings lower than .30 or being negative were those reverse items indicating that items written in a negative way may not be interpreted as the opposite of the positive items and the reverse items seem to be particularly difficult for young adolescents to understand.

The chi-square values computed for the evaluation of the lack of fit for one and two factor solutions were significant ($p < .001$) and for the three factor solutions was non-significant ($p > .05$). The chi-square values were 564.18 (df = 54), 120.92 (df = 43), and 47.16 (df = 33) for the one-, two-, and three-factor solutions. Although a statistically adequate solution, one that yielded a non-significant chi-square would require three factors, the two-factor solution was more appropriate for the sake of interpretability and parsimony. In sum, it was found that the varimax-rotated two-factor solution as

summarized in Table 5.3 corresponded most closely to the two affective traits of gratitude and indebtedness as originally intended.

Table 5.3 Summary of varimax-rotated one-, two-, and three-factor solutions for GIQ-12 in Sample A ($N = 381$)

Item	One-factor	Two-factor		Three-factor		
	solution	solution	solution	solution	solution	solution
	1	1	2	1	2	3
<i>Gratitude trait</i>						
Having so much to be thankful for (1)	65	64	3	63	10	11
Very long list of grateful things (9)	70	69	10	66	19	13
Do not see much to be grateful for (16)	20	24	-22	24	-18	16
Being grateful to many people (21)	76	77	3	75	10	11
More able to appreciate as growing older (23)	75	76	-2	79	1	-7
Long time needed for feeling grateful (25)	6	10	-25	4	-8	78
<i>Indebtedness trait</i>						
Having so much to be indebted for (34)	19	10	83	4	82	-16
Very long list of things that owe others (18)	31	24	65	18	69	-4
Do not see much to be indebted for (4)	-25	-27	14	-30	17	17
Being indebted to many people (27)	23	14	77	9	75	-17
Feeling more obligated to repay as growing older (14)	63	62	11	62	14	-5
Long time needed for feeling like to repay (7)	1	6	-35	5	-26	42

Note: Decimals are omitted in presenting the factor loading. The salient loadings above .30 are in bold. Items are arranged to display the clear factor structure. Item numbers are in parentheses.

5.2.2 Confirmation of the factor structure in a different sample

To provide support for the construct validity of gratitude and indebtedness, a confirmatory factor analysis was conducted based on the results of the two-factor solution derived from the exploratory factor analysis. Since the four reverse items had low loadings on the two dimensions, they were omitted in the confirmatory analysis. Considering that the only item of “obligation to repay” in Factor 1 assessed an aspect of indebtedness different from the aspect of indebtedness assessed in Factor 2, it was also omitted in the confirmatory analysis. As a result, the four items measuring “feeling

grateful” formed the dimension of gratitude trait and the three items measuring “feeling owing others” formed the dimension of indebtedness trait. The confirmatory factor analysis was conducted with Sample B students. A series of models were postulated for comparison.

Model 1 was a one-factor model. Seven items were equally indicative and loaded onto a single general gratitude factor. Model 2 was a two-factor model. According to the results of the exploratory factor analysis, the four items (item 1, 9, 21, 23) made up a gratitude factor and the three items (item 34, 18, 27) formed an indebtedness factor. A null model, in which there were no relations amongst all seven items and no common factor underlining these items, was also presented for reference.

Multiple fit indexes including chi-square, chi-square/degree-of-freedom ratio, the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Squared Error of Approximation (RMSEA) were selected to be the criteria for comparing different models of the seven items. If there were two latent variables (a gratitude dimension and an indebtedness dimension) underlying the seven items, Model 2 would yield a better fit to the data than other models. These models were tested using maximum likelihood confirmatory factor analysis (LISREL 8.53; Joreskog & Sorbom, 1993). Table 5.4 presents the fit indexes of the three initially specified models. It was found that the model fits of the two-factor model (Model 2) were much better than the one-factor model and the null model. The values of chi-square decreased substantially from Model 1 to Model 2 indicating that the residual covariance left unexplained decreased to a small

amount. The values of NFI, NNFI, and CFI reached .90, and the values of SRMR and RMSEA were below .10, showing a good fit of the two-factor model to the data.

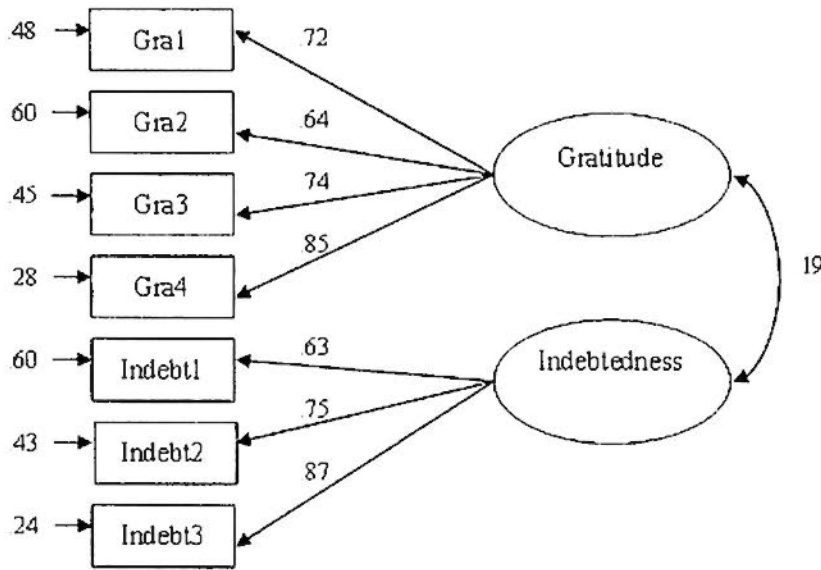
Table 5.4 Comparison of alternative factor models on the seven items of GIQ-12 in Sample B ($N = 249$)

Model specification	Goodness-of-fit indexes						
	χ^2	χ^2/df	NFI	NNFI	CFI	SRMR	RMSEA
Model 1: One factor	538.88*	31.70	.290	.120	.290	.310	.350
Model 2: Two factors	37.51*	2.86	.950	.950	.970	.062	.087
Null model	727.24	34.63					

Note: χ^2 : Chi-square
 χ^2/df : Chi-square/Degrees-of-freedom
 NFI: Normed fit index
 NNFI: Non-normed fit index
 CFI: Comparative fit index
 SRMR: Standardized root mean square residual
 RMSEA: Root mean squared error of approximation
 * $p < .001$

For the two-factor model, allowing for correlated dimensions, a good fit was indicated by the indices. The correlation between the two dimensions, gratitude trait and indebtedness trait, is .19, indicating that the participants perceived gratitude and indebtedness to be two distinct constructs with slight positive associations. The completely standardized two-factor solution was summarized in Figure 5.1.

Figure 5.1 Completely standardized two-factor solution of dispositional traits ($N = 249$)



Note: Gra1 = have so much to be thankful for; Gra2 = very long list of grateful things; Gra3 = being grateful to many people; Gra4 = more able to appreciate as growing older; Indebt1 = very long list of things that owe others; Indebt2 = being indebted to many people; Indebt3 = having so much to be indebted for.

Based on the exploratory factor analysis of the responses on GIQ-12 for Sample A ($N = 381$) and the confirmatory factor analysis of the seven items in GIQ-12 for Sample B ($N = 249$), it can be summarized that gratitude and indebtedness at the trait level were perceived to be two distinct constructs. Thus we can conclude that gratitude and indebtedness at the affective trait level can be empirically distinguished as two dispositional traits among Chinese young adolescents in Hong Kong.

5.2.3 Self-reported characteristics of gratitude and indebtedness traits, subjective well-being, and helping tendencies among Chinese young adolescents in Hong Kong

Given the results that gratitude and indebtedness can be distinguished, the aggregated item responses of all students ($N = 381$) to gratitude (4 items) and indebtedness (3 items) were computed and taken for further analysis. In order to relate the two distinct

constructs to subjective well-being and helping tendencies in later analysis, students' aggregated item responses to satisfaction with life, positive affect, negative affect, and helping tendencies were also computed (The exploratory factor analysis for the item responses in SWL, PANAS, and Helping Tendencies Checklist were conducted as the basis to compute aggregated scores, and the results were summarized in Appendix E). Table 5.5 summarizes students' mean scores, the internal consistency, and gender differences on the four scales.

The results revealed that students rated themselves relatively high on gratitude trait, helping tendencies, and positive affect, but relatively low on indebtedness trait and negative affect, indicating that Chinese young adolescents in Hong Kong generally perceived themselves as having high gratitude disposition but having relatively low indebtedness disposition, they were satisfied with their lives and they took initiative to help others, and they generally experienced high level of positive emotions and low level of negative affect in their daily lives.

The internal consistency of the four scales ranged from .74 to .85 indicating that all four scales had moderate to high level of internal consistency and they were stable and reliable, taking into account the small number of items in some scales.

To explore possible gender differences on the key variables, the one-way between-subject analysis of variance (ANOVA) was conducted. Girls rated themselves higher than boys on gratitude trait, $F(1, 139) = 14.24, p < .001$, partial $\eta^2 = .04$, and on helping tendencies, $F(1, 139) = 15.35, p < .001$, partial $\eta^2 = .04$. Girls also rated themselves higher than boys on their degree of satisfaction with life, $F(1, 139) = 3.99, p < .05$, partial $\eta^2 = .01$. Boys rated themselves higher than girls on negative affect, $F(1, 139) =$

8.50, $p < .005$, partial $\eta^2 = .02$. There were no significant gender differences found in terms of indebtedness trait and positive affect.

Table 5.5 Gender differences of means, standard deviations, and internal consistency of measures of the seven items in GIQ-12, SWL, PANAS, and Helping Tendencies Checklist

Scales	Number of items	Coefficient Alpha	Total (n = 381)	Boys (n = 207)	Girls (n = 174)	F(1, 379)
			M (SD)	M (SD)	M (SD)	
<i>Gratitude and Indebtedness</i>						
Gratitude	4	.81	4.01 (0.78)	3.87 (0.80)	4.17 (0.72)	14.24*** G > B
Indebtedness	3	.81	2.67 (1.00)	2.74 (1.06)	2.59 (0.92)	
<i>Satisfaction with Life</i>						
	5	.74	3.61 (0.78)	3.54 (0.79)	3.70 (0.74)	3.99* G > B
<i>Positive and Negative Affect</i>						
Positive affect	10	.82	3.70 (0.64)	3.71 (0.67)	3.69 (0.61)	
Negative affect	10	.85	2.36 (0.72)	2.45 (0.74)	2.23 (0.66)	8.50** B > G
<i>Helping Tendencies</i>						
	5	.83	3.98 (0.81)	3.83 (0.85)	4.15 (0.72)	15.35*** G > B

Note: The four scales are all scored in the range of 1 to 5. * $p < .05$; ** $p < .005$; *** $p < .001$.
G = girls, B = boys.

To explore the relationship between gratitude trait, indebtedness trait, satisfaction with life, positive affect, negative affect, and helping tendencies, the correlations among all variables were computed. Gender and age were also included for reference. It can be seen from the correlation matrix in Table 5.6 that there were significant and substantial positive correlations between gratitude trait and three variables, namely satisfaction with life, positive affect, and helping tendencies with correlation coefficient ranging from .51 to .55 ($p < .001$). However, there was significant negative correlation between gratitude

trait and negative affect ($r = -.15, p < .005$). The results indicated that participants reported high level of dispositional gratitude also tended to report high level of life satisfaction, rated themselves as experiencing high degree of positive affects, low degree of negative affects, and more helping tendencies. As for indebtedness trait, only significant and moderate positive correlation was found between indebtedness trait and negative affect ($r = .27, p < .001$) indicating that those having high level of dispositional indebtedness reported high level of negative affect in their daily life. Age was negatively correlated with satisfaction with life ($r = -.22, p < .001$) suggesting that the older the participants, the less satisfied they generally felt with their lives. Gender appeared to be correlated with gratitude trait ($r = -.19, p < .001$), helping tendencies ($r = -.20, p < .001$), negative affect ($r = .15, p < .005$), and satisfaction with life ($r = -.10, p < .05$), indicating that comparing with girls, boys reported lower degree of gratitude trait, helping tendencies, and life satisfaction but more negative affect.

Table 5.6 Correlation of gender, age, gratitude trait, indebtedness trait, satisfaction with life, positive affect, negative affect, and helping tendencies ($N = 381$)

	Age	Gender	Gratitude	Indebtedness	Satisfaction with life	Positive affect	Negative affect
Gender	-.05						
Gratitude	-.06	-.19***					
Indebtedness	-.01	.07	.22***				
Satisfaction with life	-.22***	-.10*	.55***	-.06			
Positive affect	-.09	.02	.51***	.04	.34***		
Negative affect	-.01	.15**	-.15**	.27***	-.20***	.00	
Helping tendencies	-.08	-.20***	.52***	.01	.30***	.48***	-.13*

Note: * $p < .05$; ** $p < .005$; *** $p < .001$. Gender was coded as Male = 1, Female = 0.

5.2.4 Differential associations of gratitude and indebtedness traits with subjective well-being and helping tendencies

To address the second research question, how dispositional gratitude and indebtedness are differentially related to subjective well-being and helping tendencies, a series of multiple linear regression analysis were conducted. The composite variables of gratitude and indebtedness traits were used as predictors. Gender and age were also included as predictors, as they were related significantly to some of the dependent variables. Specifically, satisfaction with life, positive affect, negative affect, and helping tendencies was respectively used as the criterion, and each of the regression analysis was conducted in three steps using the same “enter” procedure. Step 1 used gender and age as predictors (Set 1 predictors) to evaluate whether demographic variables could contribute significantly to the criterion without invoking the Set 2 predictors of gratitude trait and indebtedness trait. Step 2 used two ordered sets of predictors, with Set 1 predictors entered first, followed by Set 2 predictors, and the changes in R^2 and F were assessed to evaluate whether the Set 2 predictors predicted the criterion measure over and above the Set 1 predictors. Step 3 followed the same procedure and added Set 3 predictors of the two-way interaction between gratitude trait and indebtedness trait to evaluate their contribution over and above the contributions of the Set 1 and Set 2 predictors. Table 5.7 and 5.8 summarize the results of the regression analysis respectively.

5.2.4.1 Predicting subjective well-being

a) Satisfaction with life

From Table 5.7, it can be seen that Set 1 predictors of age and gender significantly predicted satisfaction with life explaining 6% of the variance, and age emerged as the

significant predictor. The addition of Set 2 predictors yielded better prediction than using Set 1 predictors alone and accounted for a significantly greater proportion of the variance (additional 31%) in predicting satisfaction with life. Gratitude trait was found to be the most significant predictor for satisfaction with life, suggesting that students who rated themselves higher on dispositional gratitude were more likely to evaluate their life as satisfying. However, indebtedness trait contributed significantly but negatively to the prediction, and to a lesser extent, suggesting that students who are dispositional indebted were less likely to feel satisfied with their life. Age was also a significant predictor, suggesting that the older students were more likely to report lower degree of life satisfaction. Gender did not contribute significantly to the prediction. The addition of Set 3 predictors did not improve in prediction indicating that the interaction between gratitude and indebtedness did not contribute significantly to the prediction of satisfaction with life.

b) Positive affect

In predicting positive affect, it can be seen from Table 5.7 that Set 1 predictors of age and gender did not significantly contribute to the prediction, explaining only 1% of the variance. The addition of Set 2 predictors yielded better prediction than using Set 1 predictors alone and accounted for a significantly greater proportion of variance (additional 27%) in predicting positive affect. Gratitude trait was found to be the most significant predictor for positive affect, suggesting that students who rated themselves higher on dispositional gratitude tended to rate themselves as experiencing more positive affect. Gender emerged as a significant predictor in Set 2. The addition of Set 3 predictors of the interaction between the two traits did not improve in prediction. There

was no reliable association found between indebtedness disposition and positive affect, indicating that indebted students might not necessarily experience less positive affect as hypothesized.

c) Negative affect

It also can be seen from Table 5.7 that Set 1 predictors of age and gender predicted negative affect, explaining 2% of the variance, and gender emerged to be the significant predictor. The addition of Set 2 predictors yielded better prediction and accounted for a significantly greater proportion of variance (additional 11%) in predicting negative affect. Indebtedness trait was found to be the most significant predictor for negative affect, suggesting that students who rated themselves higher on the proneness to feel owing others tended to report higher level experiences of negative affect. To the opposite, gratitude trait contributed significantly but negatively to the prediction, suggesting that students who were dispositionally grateful reported less experiences of negative affect. Gender turned out to be non-significant when taking the dispositional traits into consideration. The addition of Set 3 predictors improved a little (additional 1%) in prediction indicating that the interaction between gratitude and indebtedness made some contribution to the prediction of negative affect, but the effect was small compared with the main effect.

Table 5.7 Summary of multiple regression analyses for the prediction of subjective well-being (satisfaction with Life, positive affect, negative affect as criterion respectively) using predictors of demographic variables, gratitude trait, indebtedness trait, and their interaction

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	<i>R</i> ² change	<i>F</i>	<i>F</i> change
<i>Satisfaction with life</i>							
Step 1				.06		11.94***	
Age	-.53	.12	-.22***				
Gender	-.87	.39	-.11				
Step 2				.37	.31	55.53***	93.29***
Age	-.43	.10	-.18***				
Gender	.11	.33	.01				
Gratitude trait	.73	.05	.58***				
Indebtedness trait	-.24	.06	-.18***				
Step 3				.37	.00	44.51***	.62
Age	-.44	.10	-.19***				
Gender	.10	.33	.01				
Gratitude trait	.74	.06	.59***				
Indebtedness trait	-.25	.06	-.19***				
Gratitude × Indebtedness	.01	.02	.03				
<i>Positive affect</i>							
Step 1				.01		1.56	
Age	-.36	.20	-.09				
Gender	.17	.66	.01				
Step 2				.28	.27	36.85***	71.57***
Age	-.21	.17	-.05				
Gender	1.61	.58	.13**				
Gratitude trait	1.13	.10	.55***				
Indebtedness trait	-.20	.10	-.09*				
Step 3				.28	.00	29.73***	1.17
Age	-.17	.17	-.04				
Gender	1.66	.58	.13**				
Gratitude trait	1.11	.10	.54***				
Indebtedness trait	-.17	.10	-.08				
Gratitude × Indebtedness	-.03	.03	-.05				
<i>Negative affect</i>							
Step 1				.02		4.24*	
Age	.01	.22	.00				
Gender	2.12	.73	.15**				
Step 2				.13	.11	13.70***	22.68***
Age	-.05	.21	-.01				
Gender	1.24	.71	.09				
Gratitude trait	-.47	.12	-.20***				
Indebtedness trait	.73	.12	.31***				
Step 3				.14	.01	12.03***	4.79*
Age	.00	.21	.00				
Gender	1.32	.70	.09				
Gratitude trait	-.53	.12	-.23***				
Indebtedness trait	.81	.12	.34***				
Gratitude × Indebtedness	-.09	.04	-.11*				

Note: * $p < .05$, ** $p < .01$, *** $p < .001$ Gender was coded as Male = 1, Female = 0.

5.2.4.2 Predicting helping tendencies

From Table 5.8, it can be seen that Set 1 predictors of age and gender did significantly predict helping tendencies explaining 5% of the variance, and gender emerged as the significant predictor. The addition of Set 2 predictors yielded better prediction than using Set 1 predictors alone and accounted for a significantly greater proportion of variance (additional 24%) in predicting helping tendencies. Gratitude trait was found to be the most significant predictor for helping tendencies, suggesting that students who rated themselves higher on dispositional gratitude tended to report a higher degree of helping tendencies. Indebtedness trait contributed significantly but negatively to the prediction, suggesting that students who are dispositional indebted reported less initiative to engage in prosocial behaviors. It should be noted that dispositional indebtedness was not an important predictor, considering its small magnitude. Gender was a significant predictor, but its effect was comparatively small. The addition of Set 3 predictors of interaction variable did not improve the prediction.

Table 5.8 Summary of multiple regression analyses for the prediction of helping tendencies using predictors of demographic variables, gratitude trait, indebtedness trait, and their interaction

	Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	<i>R</i> ² change	<i>F</i>	<i>F</i> change
Step 1					.05		9.30***	
	Age	-.23	.12	-.09				
	Gender	-1.63	.41	-.20***				
Step 2					.29	.24	38.44***	64.46***
	Age	-.14	.11	-.06				
	Gender	-.76	.36	-.09*				
	Gratitude trait	.67	.06	.52***				
	Indebtedness trait	-.13	.06	-.10*				
Step 3					.29	.00	30.92***	.88
	Age	-.15	.11	-.06				
	Gender	-.78	.36	-.10*				
	Gratitude trait	.68	.06	.53***				
	Indebtedness trait	-.15	.06	-.11*				
	Gratitude × Indebtedness	.02	.02	.04				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ Gender was coded as Male = 1, Female = 0.

In summary, when relating gratitude and indebtedness to other constructs, namely subjective well-being and helping tendencies, gratitude and indebtedness were found to have differential associations with them. Specifically, as hypothesized, dispositional gratitude was found to positively correlate with life satisfaction and with positive affect, but negatively correlate with negative affect. However, dispositional indebtedness was found to correlate negatively with life satisfaction and positively with negative affect, but have no correlation with positive affect.

Results pertaining to helping tendencies showed that gratitude disposition was the strongest predictor for helping tendencies whereas indebtedness disposition was found to predict less helping tendencies.

Chapter 6 Study Two: Gratitude and Indebtedness as Emotions and Trait-Emotion Relationships

The objective of Study Two was to investigate the relationships of gratitude and indebtedness at emotion level through two parallel experiments: 1) to find the possible differences of emotional valence among feeling thankful, owing others, and obliged to repay through examining their affective associations with other emotional responses in specific situations; 2) to examine whether different experimental conditions (benefactor expectation to return in Study 2a and help initiation in Study 2b) can dissociate feelings of thankfulness, owing others, and obliged to repay; and 3) to investigate whether feeling thankful and feeling owing others would change differently after the completion of reciprocation.

Study two was also designed to enable the investigation of trait-emotion relationships. The correlations among feeling thankful, owing others, and obliged to repay and trait-emotion correlations were computed. In addition, how traits and emotions of gratitude and indebtedness affected prosocial motivation and reciprocation were also investigated.

6.1 Method

6.1.1 Participants

For the purpose of examining how different conditions of expectation for repayment and of help initiation affected gratitude and indebtedness, the Sample B (N = 249) participants of Study 1 was divided into two parts, approximately half of the students participated in Study 2a and another half participated in Study 2b. As a result, a total of

123 (69 boys and 54 girls) upper elementary and lower secondary students with the age range from 9 to 15 (Mean = 11.54; $SD = 1.76$) were involved in Study 2a. They were run in a group format and randomly assigned to experimental conditions (No expectation: $n = 42$, Expectation: $n = 37$, Ambiguous: $n = 44$).

A total of 126 (79 boys and 47 girls) upper elementary and lower secondary students with the age range from 9 to 15 (Mean = 11.38; $SD = 1.57$) were involved in Study 2b. They were also run in a group format and were randomly assigned to experimental conditions (Request: $n = 41$, Offer: $n = 42$, Ambiguous: $n = 43$).

6.1.2 Design of the experiments

The essential difference between the two quasi-experiments was the experimental conditions. Study 2a manipulated different conditions of benefactor expectation for repayment and Study 2b manipulated different conditions of help initiation.

For both experiments, participants were required to respond to two vignettes which described hypothetical interpersonal situations involving the process of both benefit-receiving and returning. The two vignettes were designed in order to detect possible differences of participants' responses.

For Study 2a, considered as important and typical situations in the development of friendship, receiving a birthday gift and receiving other's help were chosen as the themes of the two vignettes respectively. The gift-vignette was derived from Wellman (1999) and the helping-vignette was designed for the purpose of the study. Three conditions were manipulated by different benefactor expectation for repayment. In *No-Expectation condition*, benefactor's having no expectation for repayment was clearly communicated; in *Expectation condition*, clear expectation to repay was explicitly expressed; and in

Ambiguous condition, participants were presented with unclear information of whether or not they were expected to return the favor.

For Study 2b, the vignettes involved benefactor's salient costs in the process of providing help, at the consideration that the description of salient costs would be helpful to elicit the central concern for the locus of help initiation, i.e., who was responsible for the costs. The first vignette presented relatively low level of costs on the benefactor's side in getting the book from a friend and bringing it to the school. The second vignette described benefactor's high costs in spending a lot of time on helping to solve some math problems so that the benefactor missed the school bus. The vignette getting the "small" favor of a book was adapted from Greenberg and Saxe (1975) and revised to be more familiar for the Hong Kong young adolescents. The vignette of getting other person's "big" help was written for the purpose of this experiment. There were three different conditions of help initiation manipulated in this experiment. One was *Request Condition* in which the protagonist took the initiative to ask for other's help. The second was *Offer Condition* whereby helping was offered voluntarily by the benefactor without any solicitation. The third condition was *Ambiguous Condition* in which who made helping occur was unclear.

Participants' immediate emotional responses after reading the benefit-receiving situation and their ratings on prosocial motivations and the magnitude of reciprocation constituted the dependent measures for both experiments.

6.1.3 Materials

a) Vignettes – Study 2a: Expectation to return

Each condition comprised the same description of a situation and a completing sentence describing different experimental conditions. The first vignette described a social situation involved receiving a birthday gift as follows.

Vignette 1(V1): “Gift situation”

You and Leslie met each other in some extracurricular activities. In addition to attending a number of activities together, you've spent some time having a bite and sharing several pleasant conversations. You know Leslie likes collecting model planes and Leslie knows you love all kinds of robot models. On your birthday, unexpectedly, you receive a gift from Leslie which is a nice robot model. You say you do not know her (his) birthday yet.

The experimental manipulation was accomplished by adding one sentence to the end of the base vignette.

No-expectation Condition:

The vignette concluded with: *“She (he) replies: ‘Oh, my birthday has passed. It's your big day today and I am so happy that you like the robot model.’”*

Expectation Condition:

The vignette ended with the sentence: *“She (he) replies: ‘Oh, my birthday is on the 12th of the next month. Don't forget. You know I love model planes.’”*

Ambiguous Condition:

The response was added to the core scenario: *“She (he) smiles without saying anything.”*

The second vignette described a situation in which the protagonist receives help from a classmate.

Vignette 2 (V2): “Helping situation”

Some day before the examination, you have to stay at home because of sickness. You know the courses on that day are important since the teachers would summarize the learning materials of the whole term. After school, Tracy called you and then came to your home bringing all the handouts and her (his) detailed note.

Similarly, the experimental manipulation was accomplished by adding one sentence to the end of the base vignette.

No-expectation Condition:

The vignette concluded with: *“When you talk about Tracy’s help to a close friend, the friend says Tracy is a person who loves to offer help without expecting repayment.”*

Expectation Condition: *“When you talk about Tracy’s help to a close friend, the friend says Tracy is known for always expecting repayment when offering help.”*

Ambiguous Condition:

The response was added to the core scenario: *“When you talk about Tracy’s help to a close friend, the friend says she (he) has no idea whether Tracy is or is not the kind of person who helps others without expecting repayment.”*

The benefit-returning part of each vignette was identical to all participants which represented a chance of repayment. In the gift situation, the protagonist comes across a nice model plane which could be a good gift for Leslie. In the helping situation, Tracy asks for help in solving some math problems after school.

The end of each vignette was also identical to all participants describing the fulfillment of the reciprocal behavior in order to detect the different change patterns of felt gratitude and indebtedness after the completion of reciprocation.

The above vignettes are English translated version; See Appendix F, G, and H in Chinese for the details of vignettes for each of the three conditions respectively.

b) Vignettes – Study 2b: Help initiation

Two vignettes were written in the same form as follows.

Vignette 1 (V1): “Low-cost situation”

For V1, the first sentence for all participants was the same: *“You are currently preparing for a contest on the topic of environmental protection.”*

For the **Request Condition**, the vignette continued with: *“While searching for the materials you discover that a key book written for the topic has been checked out of the library by others. You remember that Leslie has the book so you find her (him) and ask to borrow the book. Leslie agrees.”*

In the **Offer Condition**, the scenario was presented as: *“Getting to know what you are doing, Leslie tells you that she (he) has a key book written on that topic and it must be helpful for you. Leslie offers to lend you the book.”*

For the **Ambiguous Condition**, the participants read the following sentences that the initiation of help was not explicitly stated: *“While searching for the materials you discover that a key book written for the topic has been checked out of the library by others. When you mentioned this to Leslie, unexpectedly Leslie tells you that she (he) has the book.”*

The last two sentences of the vignette were also identical across three conditions: *“Although the book has been lent by a friend, Leslie goes to the friend's home and gets it for you. Leslie brings the heavy book over to you when you meet in class. The book contains a lot of useful material and it helps you win the Excellence Award afterwards”.*

Vignette 2 (V2): “High-cost situation”

For V2, the first sentence for all participants was the same: *“Your math has been lagged behind because of lack of basic knowledge and skipping some courses. Although you have spent a lot of efforts to catch up, you still find it difficult.”*

For the **Request Condition**, the vignette continued with: *“During recession, you go to ask Tracy whether she (he) can help you solve some math problems after school. Tracy agrees.”*

In the **Offer Condition**, the scenario was presented as: *“During recession, Tracy reaches you while you are reviewing the math book. Getting to know your difficulties, Tracy offers to help you solve some math problems after school.”*

For the **Ambiguous Condition**, the participants read the following sentences that the initiation of help was not explicitly stated: *“When you are in the library reviewing your math after school, you find Tracy is also there. When you mentioned what you are doing to Tracy, unexpectedly Tracy tells you that she (he) can help you solve some math problems.”*

The last two sentences of the vignette were also identical across three conditions: *“Tracy solves the math problems with you very patiently and answered many questions that you ask. But after solving all problems, you both find the school bus has gone and Tracy has to take a bus to go home.”*

The benefit-returning part of each vignette was identical to all participants which represents a chance of repayment. In low-cost situation, Leslie asks for help in searching for part of the materials on the Internet for a project. In high-cost situation, Tracy asks for help in distributing a questionnaire to be filled for a survey.

The end of each vignette was also identical to all participants which describe the completion of the repayment.

The above vignettes are English translated version; see Appendix I, J, and K in Chinese for the details of vignettes for each of the three conditions respectively.

c) Measures

The measures used were the same for both experiments except otherwise stated.

Dispositional gratitude and indebtedness. Gratitude and indebtedness scores were computed from the relevant items in GIQ-12 as in Study 1.

Emotional responses. Twelve items were used to measure the emotional responses to the vignettes. In order to identify feelings evoked by being helped, a short questionnaire was distributed to 35 secondary students aged 11 to 13. They were at grade 7 to 8 in an international school. The participants were asked to list as many words as possible that can describe the feelings after receiving other's favor or help. Both positive and negative adjectives were found in their answers. The most frequently listed positive words were "happy", "thankful", "appreciated", "cared", "valued", and "relieved". Negative words included "uneasy", "guilty", and "*Wu-Nai*" (無奈; feeling that one can do nothing to respond or help in return). "Feeling obliged to repay" was also frequently mentioned. The participants were also asked to list the words that best describe the feelings when they receive other's favor but not yet repaid. They reported "guilty", "uneasy", "*Wu-Nai*", "must do something to repay", "owing others" and "*Bu-Hao-Yi-Si*" (不好意思; meaning that sorry or regretful for causing other's trouble or inconvenience).

Based on the above mentioned responses, ten adjectives were selected for assessment of emotional responses. Participants were requested to rate on the ten items of emotional

responses, including “happy”, “thankful”, “cared”, “uneasy”, “owing others”, “*Wu-Nai*”, “obliged to repay”, “valued”, “guilty”, and “relieved”. Two additional adjectives which were particularly relevant to the vignettes, “annoyed” and “surprised”, were also included. They were asked to respond to the emotional adjectives on a five-point Likert-type scale ranging from 1 (*none*) to 5 (*a great deal*). Study 2b used “lucky” and “*Bu-Hao-Yi-Si*” instead of “annoyed” and “surprised” for they were more relevant to the vignettes in Study 2b.

Prosocial motivation. Participants were requested to rate on three items on a five-point Likert-type scale from 1 (*none*) to 5 (*a great deal*) to measure prosocial motivation. The first item was to measure the participants’ willingness to engage in more prosocial behaviors toward the benefactor in the future. The second was to measure the participants’ willingness to engage in more prosocial behaviors toward others in the future. The third item was the participants’ willingness to engage in repayment when given a chance. A prosocial motivation score was computed by adding the three items together.

Magnitude of reciprocation. Given the chance to repay, participants were asked to decide how much they would spend to return the favor. At the consideration that absolute amount of money or time could be arbitrary and complicated (especially in terms of money), relative proportion of whole amount was designed as the measure for the magnitude of reciprocation. Participants were asked to make decision among five choices ranging from spending a very small portion of money or time for the benefactor to spending a large proportion of what they had for the benefactor, with the middle choice as spending half for the benefactor, and another half for personal needs.

Feeling thankful and feeling owing others after reciprocation. After the completion of reciprocation, participants were asked to rate on how much they felt thankful and felt owing others on a five-point scale ranging from 1 (*none*) to 5 (*a great deal*).

6.1.4 Procedure

The procedure applied for both experiments. Participants were tested in small groups. Upon their arrival, the research assistants explained general instructions including approximate time and the importance of responding according to one's own situation and feelings. Participants read the benefit-receiving situation in V1 and rated on the twelve items describing emotional responses and two items of prosocial motivation. After that, they read the benefit-returning situation and responded to the third item of prosocial motivation and the item measuring the magnitude of reciprocation. In the end, participants read the situation of the completion of reciprocation, and rated on feeling thankful and feeling owing others. V2 repeated the same pattern.

6.2 Results: Study 2a – Benefactor Expectation for Repayment

6.2.1 Manipulation checks

1) Experimental manipulation

To find out whether the experimental manipulation caused the participants to feel differently, ratings of the positive emotion adjective “happy” and the negative emotion adjective “annoyed” were compared under different experimental conditions. ANOVAs revealed that in V1 (gift situation) participants felt significantly happier under No-expectation condition ($M = 4.38$, $SD = 1.01$) than under Expectation condition ($M = 3.16$, $SD = 1.17$), $F(2, 120) = 27.69$, $p < .001$. In V2 (help situation), participants reported

similar yet stronger emotional changes, i.e., happier under No-expectation ($M = 4.43$, $SD = .70$) than under Expectation condition ($M = 2.03$, $SD = 1.14$), $F(2, 120) = 103.39$, $p < .001$. Likewise, in V1 (gift situation), participants felt significantly less annoyed toward the benefactor under No-expectation condition ($M = 1.26$, $SD = .73$) than Expectation condition ($M = 1.92$, $SD = 1.12$), $F(2, 120) = 13.43$, $p < .001$. In responding to V2 (help situation), participants again reported similar yet stronger emotional changes, i.e., they felt significantly less annoyed in No-expectation ($M = 1.19$, $SD = .59$) than Expectation condition ($M = 2.89$, $SD = 1.15$), $F(2, 120) = 54.69$, $p < .001$. The results of Ambiguous condition were similar to those under No-expectation condition. The consistent results indicated that in both situations, participants felt less happy yet more annoyed when getting to know the benefactor expecting their repayment comparing with no-expectation or the expectation information was unclear. Therefore, although only simple vignettes were used, the results suggested that the scenarios were understood appropriately by the young students as the design intended. The effects on the participants' emotional changes indicated the success of the experimental manipulation.

2) Ambiguous condition

It can be seen from the above results that the emotional level of "happy" and "annoyed" in Ambiguous condition was similar to that in No-expectation condition. In Ambiguous condition, participants were asked to rate on whether or not they tended to feel they were expected to repay, or they felt uncertain for this. The results revealed that 54.5% (in V1) and 51.2% (in V2) of the participants reported that they felt the benefactor did not expect them to repay; around 35% participants in both vignettes reported no clear idea; and only 5 (less than 12%) out of 44 participants in both vignettes reported that they

felt the benefactor expected them to repay the favor. The results indicated that although participants were given situations with ambiguous description of benefactor's expectation for repayment, more than half of the participants felt that the benefactor did not desire for a return favor.

3) Gift situation vs. helping situation

To see whether V1 (gift situation) and V2 (helping situation) were perceived as different by the participants as the design intended, a series of paired-sample t-tests on emotional responses were conducted for the three conditions respectively (see the appendix L for details). Under the No-expectation Condition, participants rated significantly higher on "surprised" and "relieved" in gift than helping situation indicating that when receiving an unexpected birthday gift without being expected to repay participants felt more surprised and relieved than receiving unexpected help. No other significant differences on positive and negative emotions were found between the two situations. Under Expectation Condition, participants rated significantly higher on "happy", "cared", "surprised", and "relieved", whereas significantly lower on "annoyed", "uneasy", and "*Wu-Nai*" in gift than helping situation. The results suggested that when being expected for repayment in the situation of receiving some help, participants felt much less positive yet more negative than in the situation of receiving a birthday gift. Under ambiguous condition, participants reported significantly higher on "cared" and significantly lower on "guilty" in helping than gift situation. Therefore, it can be seen that gift situation was perceived to be different from helping situation. Thus, the two vignettes were analyzed separately in the following analysis.

6.2.2 Descriptive statistics of the key variables

To examine how participants responded to the vignettes, descriptive statistics including means and standard deviations for the key variables under each condition and across conditions were summarized in Table 6.1.

It can be seen from the Table 6.1 that across all conditions and for both situations, the mean of feeling thankful was the highest, followed by feeling of obligation, and feeling owing others was the lowest among the three. In No-expectation condition and Ambiguous condition, the same pattern emerged. However, in Expectation condition, the mean of feeling obliged to repay was higher than feeling thankful. Feeling owing others was still the lowest. It also can be seen that feeling thankful was particularly high ($M = 4.20$), which was approaching the upper range of the scale.

Table 6.1 Means and standard deviations for key variables by conditions of benefactor expectation

Variable	All conditions N = 123		No Expectation n = 42		Expectation n = 37		Ambiguous n = 44	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Gift situation</i>								
thankful	4.20	1.11	4.62	.73	3.19	1.22	4.66	.68
owing	2.76	1.37	3.05	1.27	2.24	1.34	2.93	1.39
obliged to repay	3.89	1.09	4.05	1.06	3.68	1.23	3.91	.98
prosocial motivation	12.98	2.01	13.29	2.17	11.89	1.91	13.61	1.54
reciprocation	3.73	.82	3.81	.89	3.51	.73	3.84	.81
<i>Helping situation</i>								
thankful	3.89	1.35	4.40	.89	2.41	1.21	4.67	.61
owing	2.63	1.25	2.71	1.31	2.22	.98	2.89	1.33
obliged to repay	3.57	1.14	3.79	1.12	3.05	1.00	3.80	1.15
prosocial motivation	12.75	2.42	13.31	2.32	10.97	2.42	13.70	1.64
reciprocation	3.80	.86	3.95	.94	3.32	.81	4.07	.63
Gratitude trait	16.40	3.45	15.71	4.02	16.30	3.02	17.18	3.10
Indebtedness trait	7.88	3.22	8.33	3.41	7.84	3.09	7.48	3.17

Note: reciprocation = the magnitude of reciprocation

All variables were measured by five-point Likert-type scales. Prosocial motivation is a composite variable ranging from 4 to 15. Gratitude trait ranges from 5 to 20 and indebtedness trait ranges from 3 to 15.

Correlation matrix was also generated among the key variables in Table 6.2. It can be seen that for both gift and helping situations, gratitude trait was substantially and positively correlated with prosocial motivation, and to a much lesser extent, positively correlated with the magnitude of reciprocation. For both situations, prosocial motivation was found to be substantially and positively associated with not only gratitude trait, but also feeling thankful, feeling obliged to repay, and to a lesser extent, with feeling owing others. Prosocial motivation was found to have approximately zero correlation with indebtedness disposition.

Table 6.2 Correlations among traits, emotions, prosocial motivation, and the magnitude of reciprocation ($N = 123$) in V1 (gift situation) and V2 (Helping situation)

	1	2	3	4	5	6
Gift situation						
1. Gratitude trait	-					
2. Indebtedness trait	.10	-				
3. Feeling thankful	.15	.05	-			
4. Feeling owing others	.03	.44***	.19*	-		
5. Feeling obliged to repay	.18*	.10	.23*	.36***	-	
6. Prosocial motivation	.49***	.01	.53***	.25**	.34***	-
7. Magnitude of reciprocation	.20*	.09	.19*	.28**	.19*	.36***
Helping situation						
1. Gratitude trait	-					
2. Indebtedness trait	.10	-				
3. Feeling thankful	.18	.00	-			
4. Feeling owing others	-.10	.30**	.27**	-		
5. Feeling obliged to repay	.15	.20*	.41***	.39***	-	
6. Prosocial motivation	.45***	-.01	.65***	.19*	.45***	-
7. Magnitude of reciprocation	.24**	.07	.40***	.18	.29**	.52***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

6.2.3 Emotional valence of feeling thankful, owing others, and obliged to repay

To address the first research question at the emotion level, i.e., whether or not feeling thankful, owing others, and obliged to repay have different emotional valence, the three feelings were correlated with both positive and negative emotional responses in gift and helping situation respectively. The results were summarized in Table 6.3.

It can be seen that the results yielded clear differences among feeling thankful, owing others, and obliged to repay. In gift situation, feeling thankful was found to covary with positive emotions such as “happy”, “cared”, “surprised”, and “relieved”, whereas negatively correlated with “annoyed” and “*Wu-Nai*”. In helping situation, feeling thankful was found to covary with more positive emotions (“valued” in addition) and to a

stronger extent but negatively and more strongly associated with more negative emotions (“uneasy” and “guilty” in addition). The results indicated that feeling thankful was felt purely positive, that is participants who reported feeling more thankful not only felt more positive, but also felt less negative. The associations were found to be stronger in the situation where one receives other’s help than receiving a gift.

However, the results of feeling owing others were found to be mixed. Specifically, in gift situation, feeling owing others was found to covary with negative emotions such as “guilty” and “uneasy”, and also with some of the positive emotions such as “cared”, but negatively correlated with “relieved”. In helping situation, feeling owing others was found to be significantly and slightly associated with only two positive emotions, i.e., “happy” and “cared”. The results suggested that owing others was felt as a mixed emotion in receiving other’s gift; however, it was felt slightly positive in the situation of getting other’s help.

The results of feeling obliged to repay was also found to be mixed. In gift situation, feeling obliged to repay covaried with “valued” and “cared” and also covaried more strongly with “guilty” and “uneasy”. In helping situation, feeling obliged to repay was positively associated with more positive emotions (“happy” and “surprised” in addition) but negatively correlated with “uneasy”, “*Wu-Nai*”, and “annoyed”. The results indicated a clear difference between the two situations. In helping situation, feeling obliged to repay was felt very positive, associated with more positive emotions and less negative emotions; whereas in gift situation, feeling obliged to repay was felt as a mixed emotion.

To summarize, feeling thankful was perceived to be positive whereas feeling like owing and obliged to repay were felt to be mixed among the Chinese young adolescents

in Hong Kong. In the situation where one received a gift, thankfulness was felt positive, owing others was felt as a mixed feeling with strong negative tone, and obliged to repay was felt to be mixed; however, in the situation where one received other's help, three feelings were all felt positive, with increasing degree from feeling owing others to feeling thankful.

Table 6.3 Correlations with other emotional responses in V1 (gift situation) and V2 (helping situation)

Emotional responses	Gift situation			Helping situation		
	Thankful	Owing	Obliged	Thankful	Owing	Obliged
<i>Positive emotions</i>						
Happy	.63***	.09	.10	.82***	.19*	.40***
Cared	.59***	.18*	.19*	.84***	.18*	.40***
Valued	.06	-.01	.25**	.27**	.09	.19*
Relieved	.24**	-.21*	-.12	.46**	-.05	.12
<i>Negative emotions</i>						
Uneasy	-.13	.24**	.20*	-.64***	.06	-.21*
<i>Wu-Nai</i>	-.25**	.16	.13	-.68***	-.12	-.23**
Guilty	.12	.54***	.35***	-.25**	.11	-.01
Surprised	.48***	.09	.14	.69***	.16	.28**
Annoyed	-.32***	.07	.06	-.59***	-.07	-.22*

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Wu-Nai = 無奈; feeling that one can do nothing to respond or help in return

The last two adjectives which are particularly relevant to the specific vignette were arranged in the bottom of the table

6.2.4 Feeling thankful, owing others, and obliged to repay under conditions of expectation to return

To address the second research question investigating gratitude and indebtedness at the emotion level, i.e., "Can different conditions of expectation to return disassociate feeling thankful, owing others, and obliged to repay?", A two-way 3 (No-expectation vs. Expectation vs. Ambiguous condition) \times 3 (feeling thankful vs. owing vs. obliged)

Condition by Emotion mixed ANOVA on the extent of emotion was conducted for gift and helping situations respectively. The results were summarized in Table 6.4.

In gift situation, the results revealed a main effect of emotion type, $F(2, 240) = 68.67$, $p < .001$. Participants felt significantly more thankful ($M = 4.20$, $SD = 1.11$) than obliged to repay ($M = 3.89$, $SD = 1.09$), and more obliged to repay than feeling owing others ($M = 2.76$, $SD = 1.37$) toward their benefactor after receiving a gift. There was also a significant main effect of the expectation condition, $F(2, 120) = 15.42$, $p < .001$, indicating that different conditions of benefactor expectation for repayment significantly affected participants' extent of emotional responses.

The effect was qualified by a significant Expectation by Emotion interaction, $F(4, 240) = 4.44$, $p < .005$. Simple effect analysis of paired samples t-tests revealed that participants felt significantly more thankful ($M = 4.62$, $SD = .73$) than obliged to repay ($M = 4.05$, $SD = 1.06$) in the No-expectation condition ($t = 3.41$, $p = .001$). However, in the Expectation condition, participants felt more obliged to repay ($M = 3.68$, $SD = 1.23$) than thankful ($M = 3.19$, $SD = 1.11$) ($t = -1.90$, $p = .065$). The results of one-way ANOVA also showed that feeling thankful was very sensitive to the variation of the condition, $F(2, 120) = 34.22$, $p < .001$. Feeling owing others was also sensitive, $F(2, 120) = 4.12$, $p < .019$. Post-hoc comparison suggested that participants felt significantly higher level of feeling thankful and owing others under No-expectation condition and Ambiguous condition than Expectation condition. No difference was found between No-expectation and Ambiguous condition. Feeling obliged to repay did not vary significantly under different conditions.

Similar but stronger results were found in helping situation. There was a main effect of emotion type, $F(2, 240) = 56.13, p < .001$. Participants felt significantly more thankful ($M = 3.89, SD = 1.35$) than obliged ($M = 3.57, SD = 1.14$), and more obliged than indebted ($M = 2.63, SD = 1.25$) toward their benefactor after receiving other's help. Again, there was a significant main effect of the expectation condition, $F(2, 120) = 29.18, p < .001$.

An Expectation by Emotion interaction effect was also found, $F(4, 240) = 10.76, p < .001$. Simple effect of paired samples t-tests showed that participants felt significantly more thankful ($M = 4.40, SD = .89$) than obliged to repay ($M = 3.79, SD = 1.12$) under the No-expectation condition ($t = 3.07, p = .004$). However, they felt significantly more obliged to repay ($M = 3.05, SD = 1.00$) than thankful ($M = 2.41, SD = 1.21$) ($t = -3.63, p = .001$) under Expectation condition. The level of feeling thankful was almost as low as feeling owing others ($t = .85, p = .40$). The results of one-way ANOVA also showed that feeling thankful was highly sensitive to whether or not one was expected to repay, $F(2, 120) = 70.55, p < .001$. Feeling obliged to repay also varied under different conditions, $F(2, 120) = 5.96, p = .003$. Feeling owing others was the least sensitive, $F(2, 120) = 3.28, p = .041$. Post-hoc comparison analysis suggested that for the three feelings, participants felt significantly higher under No-expectation condition and Ambiguous condition than Expectation condition. No significant difference was found between No-expectation and Ambiguous condition.

Table 6.4 Results of condition (Expectation to return) by emotion mixed ANOVA on the extent of emotions

	<i>F</i>	<i>p</i>	Partial η^2
<i>Gift situation</i>			
Condition	15.24 (2,120)	.000	.20
Emotion	68.67 (2,240)	.000	.36
Condition \times Emotion	4.44 (4, 240)	.002	.07
<i>Helping situation</i>			
Condition	29.18 (2, 120)	.000	.33
Emotion	56.13 (2, 240)	.000	.32
Condition \times Emotion	10.76 (4, 240)	.000	.15

The results were also summarized in Figure 6.1 and 6.2. In the two different situations, i.e., receiving a gift and receiving other's help, the experimental manipulation of benefactor's expectation for repayment elicited more feeling thankful than feeling obliged to repay, and elicited the least degree of feeling owing others among the three. When getting to know they were not expected to return the benefit, participants reported higher on feel thankful than feeling obliged to repay. However, when the repayment expectation was clearly communicated, participants reported higher level of feeling obliged to repay than feeling thankful in both situations. The three emotional responses were demonstrating the similar change pattern under the three conditions, i.e., when the benefactor's expectation was clearly known, the participants reported lower level of feeling thankful, feeling owing others, and feeling obliged to repay than No-expectation and Ambiguous condition. Feeling thankful was the most sensitive to whether or not repayment was expected than feeling obliged to repay and owing others. In addition, feeling thankful dropped more dramatically in helping situation than in gift situation.

Figure 6.1 Feeling thankful, owing others, and obliged to repay by benefactor expectation conditions in V1 (gift situation)

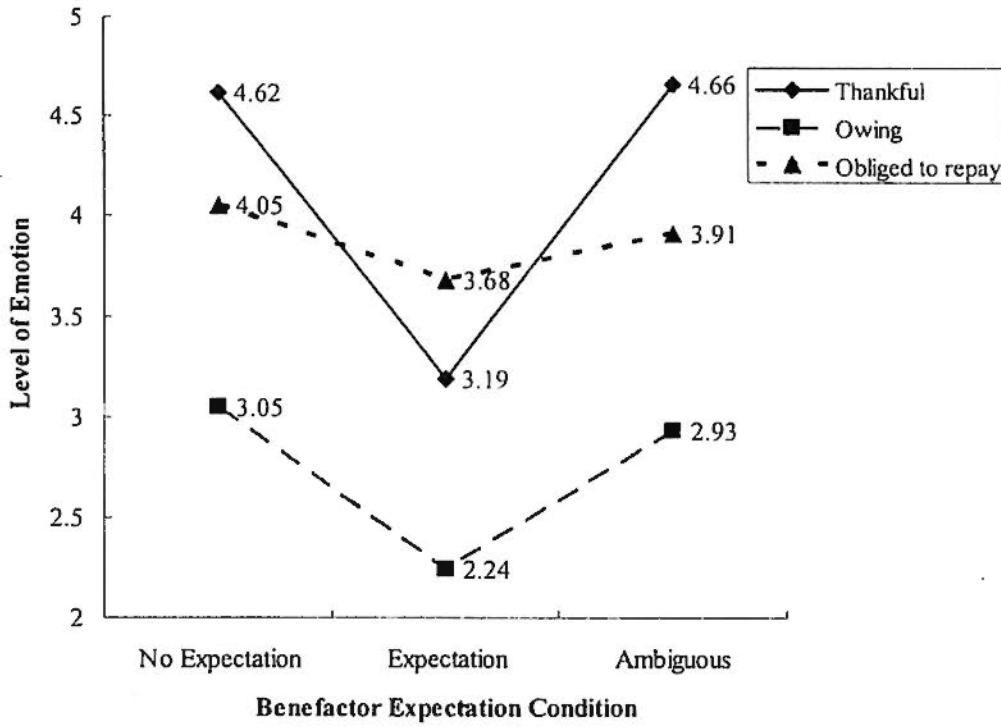
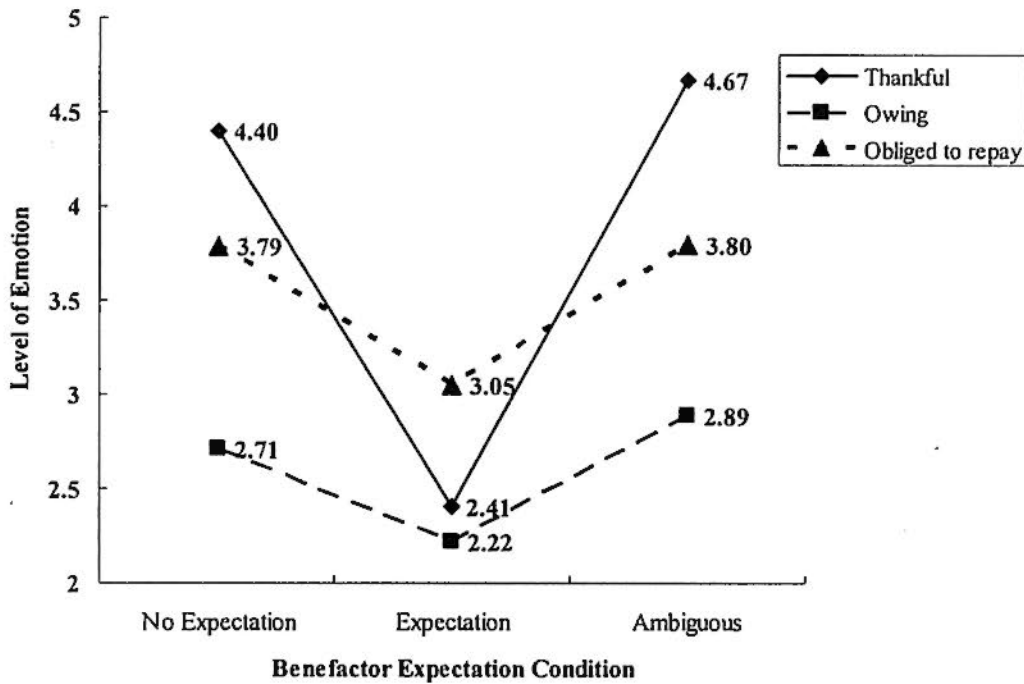


Figure 6.2 Feeling thankful, owing others, and obliged to repay by benefactor expectation conditions in V2 (helping situation)



6.2.5 Change patterns of feeling thankful and owing others after reciprocation

In order to address the third research question to find out the emotional changes of feeling thankful and owing others before and after reciprocation, a series of paired samples t-tests were conducted. The results in Table 6.5 indicated that for both situations, feeling owing others substantially decreased after the repayment was fulfilled ($t = 9.33, p < .001$ for gift situation; $t = 9.56, p < .001$ for helping situation). However, feeling thankful after receiving the benefit and after the completion of repayment did not change significantly.

Table 6.5 Paired samples t-tests for the change of feeling thankful and owing others before and after reciprocation in V1 (gift situation) and V2 (helping situation)

		Mean	SD	t	df	Sig.(2-tailed)
<i>Gift situation</i>						
Pair 1	thankful-before	4.20	1.11	1.42	122	.16
	thankful-after	4.07	1.01			
Pair 2	owing-before	2.76	1.37	9.33***	122	.00
	owing-after	1.70	.95			
<i>Helping situation</i>						
Pair 3	thankful-before	3.88	1.35	-.78	120	.44
	thankful-after	3.97	1.23			
Pair 4	owing-before	2.61	1.25	9.56***	121	.00
	owing-after	1.62	.93			

Note: *** $p < .001$.

6.3 Results: Study 2b - Help Initiation

6.3.1 Manipulation checks

- 1) Experimental manipulation

To find out emotional changes by the experimental manipulation, ratings of the emotion adjectives “happy” and “*Bu-Hao-Yi-Si*” were compared under different experimental conditions. ANOVAs revealed that in V1 (low-cost situation) participants felt significantly happier under Offer condition ($M = 4.36$, $SD = .76$) than under Ambiguous condition ($M = 3.74$, $SD = 1.24$), $F(2, 123) = 4.00$, $p < .05$. Participants reported slightly happier in Offer than Request condition with no significant difference. In V2 (high-cost situation), participants reported similar yet stronger emotional changes, i.e., happier under Offer condition ($M = 4.19$, $SD = 1.07$) than under Ambiguous condition ($M = 3.35$, $SD = 1.33$), $F(2, 123) = 6.03$, $p < .01$. Again, no difference was found between Request and Offer condition. Similarly, in V1 (low-cost situation), participants felt significantly more *Bu-Hao-Yi-Si* under Ambiguous condition ($M = 4.12$, $SD = .94$) than Request condition ($M = 3.56$, $SD = 1.07$), $F(2, 123) = 3.07$, $p = .05$. No significant difference was found between Request and Offer condition. In responding to V2 (high-cost situation), participants reported similar degree of *Bu-Hao-Yi-Si* among the three conditions. Therefore, it seemed that the scenarios were not perceived to be different between Request and Offer condition by the young students.

2) Ambiguous condition

In Ambiguous condition, participants were asked to rate on whether or not they tended to feel the favor was due to their request or other’s offering, or they were unclear about this. The results revealed that 39% (in V1) and 36% (in V2) of the participants tended to feel the favor was due to their request; around 46% (in V1) or 43% (in V2) of the participants felt the favor was out of the benefactor’s offering. 15% (in V1) or 23% (in V2) of the participants had no clear idea.

3) Low-cost situation vs. high-cost situation

To see whether V1 and V2 were perceived as different by the participants, a series of paired samples t-tests on emotional responses were conducted for the three conditions respectively (see the appendix M for detailed table of results). Under the Request condition, participants rated significantly higher on “cared” ($t = -3.43, p < .01$) in high-cost than low-cost situation. They rated higher on “*Wu-Nai*” ($t = 2.82, p < .01$) in low- than high-cost situation. In addition, participants rated higher on “*Bu-Hao-Yi-Si*” ($t = -3.48, p < .01$), “uneasy” ($t = -3.19, p < .01$), and “guilty” ($t = -4.27, p < .001$) in high-cost situation than in low-cost situation. Under Offer condition, participants rated higher on “relieved” ($t = 3.12, p < .01$) in low- than high-cost situation but higher on “*Bu-Hao-Yi-Si*” ($t = -2.05, p < .05$) and “guilty” ($t = -2.79, p < .01$) in high-cost situation than in low-cost situation. Under Ambiguous condition, participants reported higher on “cared” ($t = -2.20, p < .05$), “*Bu-Hao-Yi-Si*” ($t = -2.30, p < .05$), “*Wu-Nai*” ($t = -3.52, p < .01$), “uneasy” ($t = -4.68, p < .001$), and “guilty” ($t = -4.40, p < .001$) in high-cost than low-cost situation. In sum, in the situation involving benefactor’s high costs, participants felt significantly stronger positive emotion such as being cared and stronger negative emotions such as *Bu-Hao-Yi-Si* and guilty than in the situation involving benefactor’s relatively low costs. Thus, the two vignettes were analyzed separately in the following analysis.

6.3.2 Descriptive statistics of the key variables

To explore how participants responded to the vignettes, descriptive statistics including means and standard deviations for the key variables under each condition and across conditions were summarized in Table 6.6.

It can be seen from the Table 6.6 that in both situations and across all conditions, the mean of thankfulness was the highest, followed by feeling obliged to repay, and feeling owing others was the lowest. For each of the three conditions, the same pattern emerged. The mean of thankfulness across situations was even higher than the result found in Study 2a.

Table 6.6 Means and standard deviations for key variables by conditions of help initiation

Variable	All conditions N = 126		Request n = 41		Offer n = 42		Ambiguous n = 43	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Low-cost situation</i>								
thankful	4.63	.64	4.66	.53	4.69	.64	4.53	.74
owing	3.26	1.22	3.15	1.04	3.17	1.41	3.47	1.18
obliged to repay	3.98	.97	3.63	.99	4.00	.99	4.28	.83
prosocial motivation	13.16	1.96	12.54	2.32	13.31	1.92	13.60	1.45
reciprocation	3.23	.75	3.12	.71	3.20	.72	3.38	.80
<i>High-cost situation</i>								
thankful	4.54	.67	4.51	.78	4.62	.54	4.49	.67
owing	3.69	1.24	3.41	1.25	3.71	1.33	3.93	1.12
obliged to repay	4.21	.99	4.07	.99	4.24	1.01	4.33	.97
prosocial motivation	13.55	1.82	13.02	2.15	13.86	1.59	13.74	1.61
reciprocation	3.40	.81	3.24	.70	3.31	.84	3.63	.85
Gratitude trait	16.08	3.37	15.80	3.63	16.26	3.36	16.16	3.17
Indebtedness trait	7.62	3.02	7.39	2.41	7.48	3.29	7.98	3.29

Note: reciprocation = the magnitude of reciprocation

All variables were measured by five-point Likert-type scales. Prosocial motivation is a composite variable ranging from 4 to 15. Gratitude trait ranges from 5 to 20 and indebtedness trait ranges from 3 to 15.

Correlation matrix was also generated among the key variables in Table 6.7. It can be seen that for both situations, gratitude trait was positively correlated with feeling thankful and more substantially with prosocial motivation, but not significantly correlated with the magnitude of reciprocation. Indebtedness trait correlated with feeling like owing others and obliged to repay in both situations. Prosocial motivation was found to be positively

associated with feeling thankful and obliged to repay in low-cost situation and was correlated with all three feelings in high-cost situation.

Table 6.7 Correlations among traits, emotions, prosocial motivation, and the magnitude of reciprocation ($N = 126$) in V1 (low-cost situation) and V2 (high-cost situation).

	1	2	3	4	5	6
<i>Low-cost situation</i>						
1. Gratitude trait	-					
2. Indebtedness trait	.31***	-				
3. Feeling thankful	.25**	.02	-			
4. Feeling owing others	.01	.31**	.13	-		
5. Feeling obliged to repay	.28**	.26**	.19*	.41***	-	
6. Prosocial motivation	.48***	.03	.41***	.09	.41***	-
7. Magnitude of reciprocation	.14	.12	.20*	.13	.28**	.44***
<i>High-cost situation</i>						
1. Gratitude trait	-					
2. Indebtedness trait	.31***	-				
3. Feeling thankful	.34***	.03	-			
4. Feeling owing others	-.07	.21*	.24**	-		
5. Feeling obliged to repay	.08	.21*	.29**	.57***	-	
6. Prosocial motivation	.49***	.01	.45***	.19*	.41***	-
7. Magnitude of reciprocation	.00	-.04	.10	.29**	.32***	.31***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

6.3.3 Emotional valence of feeling thankful, owing others, and obliged to repay

Similar to Study 2a, bivariate correlation analysis was conducted to address the research question of emotional valence of the three feelings. The results in Table 6.8 yielded clear differences among feeling thankful, owing others, and obliged to repay in terms of their associations with both positive and negative emotional responses.

In low-cost situation, feeling thankful was found to covary with "cared" and "happy" whereas negatively associated with "guilty" and "*Wu-Nai*". In high-cost situation, feeling thankful was significantly and positively correlated with "cared".

However, the results of feeling like owing others and feeling obliged to repay was found to be mixed. Specifically, in low-cost situation, feeling owing others was found to covary with "guilty" and "lucky". In high-cost situation, feeling owing others positively correlated with "guilty", "uneasy", and "*Wu-Nai*", and also with "lucky" and "cared". The results suggested that feeling like owing was felt as a mixed emotion for both situations but the associations were stronger in high-cost situation.

In low-cost situation, feeling obliged to repay was found to covary with "guilty" and also with "cared" and "lucky". In high-cost situation, feeling obliged to repay positively correlated with more negative emotions ("uneasy" in addition) and also with "cared" and "lucky".

Noteworthy is that the three feelings were all positively correlated with "*Bu-Hao-Yi-Si*", with varied correlation coefficients ranging from .27 to .63. Feeling owing others was found to have the strongest association with feeling *Bu-Hao-Yi-Si*, and the association was stronger in the situation which involved high costs for the benefactor. The association between feeling thankful and *Bu-Hao-Yi-Si* was the weakest among the three.

To summarize, in the situation which involved low costs for the benefactor in providing a book, thankfulness was felt positive, owing others and obliged to repay were felt to be mixed; however, in the situation involving high costs in helping to solve some math problems, thankfulness was felt less positive, owing others was felt as mixed with

more negative associations, and obliged to repay was also felt as a mixed feeling. Feeling obliged to repay was found to be more strongly associated with “cared” but less strongly associated with negative emotions such as “guilty” than feeling owing others in both situations. The three feelings were all found to be associated with feeling “*Bu-Hao-Yi-Si*” for causing troubles for the benefactor.

Table 6.8 Correlations with other emotional responses in V1 (low-cost situation) and V2 (high-cost situation)

Emotional responses	Low-cost situation			High-cost situation		
	Thankful	Owing	Obliged	Thankful	Owing	Obliged
<i>Positive Affects</i>						
Happy	.19*	.06	.03	.08	-.07	-.06
Cared	.33***	.15	.28**	.42***	.22*	.34***
Valued	-.14	.03	.13	.11	.03	.12
Relieved	.04	-.08	-.08	.03	-.11	.01
<i>Negative Affects</i>						
Uneasy	-.09	.14	.11	.11	.26**	.20*
<i>Wu-Nai</i>	-.19*	.10	.14	-.13	.20*	.12
Guilty	-.22*	.25**	.23*	.14	.36***	.27**
Lucky	.16	.24**	.25**	.08	.29**	.18*
<i>Bu-Hao-Yi-Si</i>	.33***	.46***	.45***	.27**	.63***	.38***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Wu-Nai = 無奈; feeling that one can do nothing to respond or help in return

Bu-Hao-Yi-Si = 不好意思; feeling sorry or regretful for causing other's trouble or inconvenience

The last two adjectives which are particularly relevant to the specific vignette were arranged in the bottom of the table

6.3.4 Feeling thankful, owing others, and obliged to repay under conditions of help initiation

To find out whether different help initiation can disassociate the three feelings, a two-way 3 condition (Request vs. Offer vs. Ambiguous) \times 3 emotion (thankful vs. owing vs. obliged) mixed ANOVA on the extent of emotion was conducted and the results were summarized in Table 6.9.

The results revealed a main effect of emotion type, $F(2, 246) = 84.69, p < .001$. Similar to the results in Study 2a, participants felt significantly more thankful ($M = 4.63, SD = .64$) than obliged to repay ($M = 3.98, SD = .97$), and more obliged to repay than owing others ($M = 3.26, SD = 1.22$) toward their benefactor in low-cost situation. The main effect of the help initiation condition was non-significant, $F(2, 123) = 1.77, p > .05$, indicating that different conditions of help initiation did not affect participants' extent of emotion. There was slightly significant interaction effect was found, $F(4, 246) = 2.55, p = .04$. Simple effect of paired samples t-tests showed that participants felt significantly more thankful ($M = 4.66, SD = .53$) than obliged to repay ($M = 3.63, SD = .99$) under the Request condition ($t = 6.82, p < .001$). But they felt similar level of feeling thankful ($M = 4.53, SD = .74$) and feeling obliged to repay ($M = 4.28, SD = .83$) ($t = 1.57, p = .125$) under Ambiguous condition. The results of one-way ANOVA also showed that feeling obliged to repay varied as function of different help initiation, $F(2, 123) = 4.98, p = .008$. Post-hoc comparison analysis suggested that participants felt significantly more obliged to repay under Ambiguous condition than Request condition. No difference was found between Request and Offer condition.

For V2 (high-cost situation), there was a main effect of emotion type found in the results, $F(2, 246) = 37.49, p < .001$. Similarly, participants felt significantly more feeling thankful ($M = 4.54, SD = .67$) than feeling obliged to repay ($M = 4.21, SD = .99$), and more feeling obliged to repay than feeling owing others ($M = 3.69, SD = 1.24$) toward their benefactor after receiving other's help in solving math problems. In addition, there was no significant main effect of help initiation was found, $F(2, 123) = 1.24, p > .05$. No significant interaction effect was found in V2.

Table 6.9 Results of condition (help initiation) by emotion mixed ANOVA on the extent of emotions

	<i>F</i>	<i>p</i>	Partial η^2
<i>Low-cost situation</i>			
Condition	1.77 (2,123)	.174	.03
Emotion	84.69 (2,246)	.000	.41
Condition \times Emotion	2.55 (4, 246)	.040	.04
<i>High-cost situation</i>			
Condition	1.24 (2, 123)	.293	.02
Emotion	37.49 (2, 246)	.000	.23
Condition \times Emotion	1.28 (4, 246)	.279	.02

The results were also summarized in Figure 6.3 and 6.4 for V1 and V2 respectively. To summarize, in the two different situations, i.e., low-cost situation for the benefactor in providing a book and high-cost situation in providing substantial help, the experimental manipulation of help initiation elicited more feeling thankful than feeling obliged to repay and elicited the least degree of feeling owing others among the three. Across the two different situations, the extent of emotions was largely similar under different conditions.

Figure 6.3 Feeling thankful, owing others, and obliged to repay by help initiation conditions in V1 (low-cost situation)

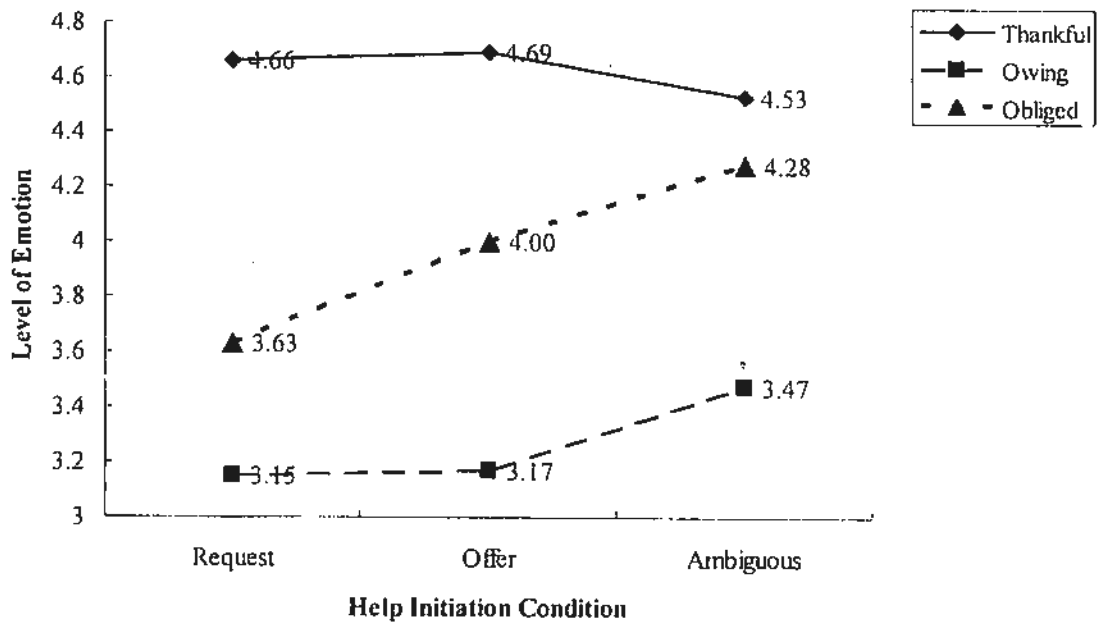
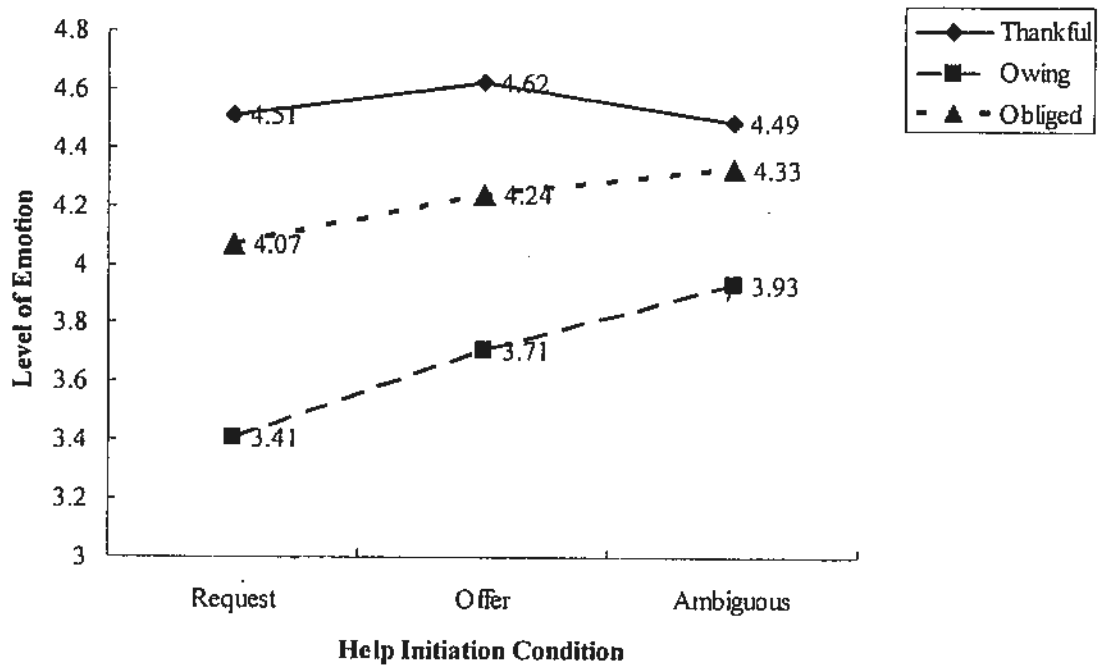


Figure 6.4 Feeling thankful, owing others, and obliged to repay by help initiation conditions in V2 (high-cost situation)



6.3.5 Change patterns of feeling thankful and owing others after reciprocation

To investigate how feeling thankful and feeling owing others would change before and after reciprocation was fulfilled, similar series of paired samples t-tests were conducted. The results in Table 6.10 indicated that for both situations which involved salient costs for the benefactor, feeling owing others substantially decreased after the repayment was fulfilled ($t = 9.63, p < .001$ for low-cost situation; $t = 12.69, p < .001$ for high-cost situation). In addition, feeling thankful also significantly decreased after reciprocation ($t = 6.31, p < .001$ for low-cost situation; $t = 4.03, p < .001$ for high-cost situation). Comparatively, the magnitude of t-value was bigger in feeling owing others than that of feeling thankful, indicating that the decrease of feeling owing others after reciprocation was more salient.

Table 6.10 Paired samples t-tests for the change of feeling thankful and owing others before and after reciprocation in V1 (low-cost situation) and V2 (high-cost situation)

		Mean	SD	t	df	Sig.(2-tailed)
<i>Low-cost situation</i>						
Pair 1	thankful-before	4.63	.64	6.31***	125	.00
	thankful-after	4.05	1.00			
Pair 2	owing-before	3.26	1.22	9.63***	124	.00
	owing-after	2.14	1.20			
<i>High-cost situation</i>						
Pair 3	thankful-before	4.54	.67	4.03***	125	.00
	thankful-after	4.23	.97			
Pair 4	owing-before	3.69	1.24	12.69***	125	.00
	owing-after	2.21	1.18			

Note: *** $p < .001$

6.4 Results: Trait-Emotion Relationships

The study investigated both gratitude and indebtedness at trait and emotion levels, thus enabling the investigation of trait-emotion relationships. Specifically, in this section, data analysis addressed the three research questions: 1) how feeling thankful, owing others, and obliged to repay correlated with each other; 2) how gratitude and indebtedness disposition was associated with feeling thankful, owing others, and obliged to repay; 3) how gratitude and indebtedness as traits and as emotions influenced prosocial motivation and the magnitude of reciprocation.

6.4.1 Relationships among feeling thankful, owing others, and obliged to repay in different situations

Bivariate correlation analyses among the three feelings in both Study 2a and 2b were conducted and summarized in Table 6.11. It can be seen that in gift situation, feeling thankful was slightly associated with feeling owing others ($r = .19, p < .05$) and feeling obliged to repay ($r = .23, p < .05$). Feeling owing others and feeling obliged to repay were found to be moderately associated ($r = .36, p < .001$). In helping situation, the associations were stronger. Feeling thankful was moderately associated with feeling owing others ($r = .27, p < .01$) and feeling obliged to repay ($r = .41, p < .001$). Feeling owing others and obliged to repay were moderately and significantly correlated ($r = .39, p < .001$).

In the situations involving salient costs for the benefactor, the correlation between feeling thankful and owing others were significant only in the high-cost situation ($r = .23, p < .01$) but not significant in the low-cost situation. The association between feeling thankful and obliged to repay was found to be stronger in high-cost ($r = .29, p < .01$) than

low-cost situation ($r = .19, p < .05$). Feeling owing others and obliged to repay were found to be strongly associated ($r = .41, p < .001; r = .57, p < .001$) in both situations.

Note that in the correlational matrixes of Table 6.3 and 6.8 in previous section, a few emotional responses were found to be significantly and positively correlated with all three feelings, specifically, "cared" in gift situation, "happy" and "cared" in helping situation, "*Bu-Hao-Yi-Si*" in low-cost situation, and "cared" and "*Bu-Hao-Yi-Si*" in high-cost situation. In order to understand how feeling thankful, owing others, and obliged to repay related to each other while partialing out the variance of these common variables, partial correlations were conducted with "cared", "happy" and "cared", "*Bu-Hao-Yi-Si*", "cared" and "*Bu-Hao-Yi-Si*" as controlling variables for each of the four situations respectively. The results were also summarized in Table 6.11. It can be seen that the partial correlation coefficients were largely suppressed comparing with the original ones by extracting the common variance explained by the overlapping emotions. The associations between owing others and obliged to repay were still substantial and significant although slightly weaker. The associations between feeling thankful and feeling obliged to repay across different situations turned out to be non-significant or even approaching zero, indicating that the associations were situational dependent and the controlling variables such as "cared", "happy", and "*Bu-Hao-Yi-Si*" were common variance contributing to both feeling thankful and obligation to repay. The largest suppression from .41 to .07 was the association between feeling thankful and obliged to repay in the helping situation, suggesting that the overlapping between feeling thankful and obligation to repay was especially due to feeling happy and being cared in the

situation of receiving other's help. The correlations between feeling thankful and feeling owing others also became non-significant in most situations.

In sum, feeling owing others and obliged to repay was consistently found to have positive and moderate correlations, even after controlling for the overlapping emotions. However, after controlling for the common variance of other emotions such as "happy", "cared", and "*Bu-Hao-Yi-Si*", feeling thankful and owing others were generally not significantly correlated, and feeling thankful was also relatively independent of feeling obliged to repay.

Table 6.11 Partial correlations and zero-order correlations among feeling thankful, feeling owing others, and feeling obliged to repay in the situations of Study 2a and Study 2b

Emotion	Zero-order correlation		Partial correlation	
	Thankful	Owing	Thankful	Owing
<i>Study 2a</i>				
Gift situation				
Owing others	.19*	-	.11	-
Obliged to repay	.23*	.36***	.15	.34***
Helping situation				
Owing others	.27**	-	.20*	-
Obliged to repay	.41***	.39***	.07	.34***
<i>Study 2b</i>				
Low-cost situation				
Owing others	.13	-	-.01	-
Obliged to repay	.19*	.41***	.06	.25**
High-cost situation				
Owing others	.23**	-	.03	-
Obliged to repay	.29**	.57***	.10	.45***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Controlling variables in different situations: "cared" in Gift situation, "cared" and "happy" in Helping situation, "Bu-Hao-Yi-Si" in Low-cost situation, "Bu-Hao-Yi-Si" and "cared" in High-cost situation

6.4.2 Trait-emotion correlations

In order to examine how dispositional gratitude and indebtedness might differentially correlate with relevant emotional states in both study 2a and 2b, a series of bivariate correlation analysis were conducted and summarized in Table 6.12.

Dispositional indebtedness was found to be significantly associated with feeling owing others in four different situations (gift: $r = .44, p < .001$; helping: $r = .30, p < .01$; low-cost: $r = .31, p < .01$; high-cost: $r = .21, p < .05$). However, feeling thankful was more dependent on situations. For gift and helping situation, the associations were

positive but not significant. For low- and high-cost situation, the associations were significantly and moderately positive (low-cost: $r = .25, p < .01$; high-cost: $r = .34, p < .001$). From earlier analysis, we know that feeling thankful was particularly sensitive to the condition of expectation to return. When explicitly being expected for repayment, more grateful students might also respond with low level of feeling thankful in a similar way as less grateful students, therefore making the general association between gratitude trait and feeling thankful largely suppressed. Supplementary analysis supported this speculation (Gift situation: no-expectation: $r = .30, p > .05$; expectation: $r = .07, p > .05$; ambiguous: $r = .17, p > .05$; Helping situation: no-expectation: $r = .29, p > .05$; expectation: $r = .06, p > .05$; ambiguous: $r = .63, p < .001$).

Consistently for the four situations in study 2a and 2b, gratitude trait was found to have no correlation with feeling owing others, with nearly all correlation coefficients approaching zero. Likewise, indebtedness trait did not correlate with feeling thankful.

Both dispositional traits were found to have some associations with the feeling of obliged to repay. Indebtedness trait and feeling obliged to repay were found to correlate with each other in nearly all situations (helping: $r = .20, p < .05$; low-cost: $r = .26, p < .05$; high-cost: $r = .21, p < .05$). Gratitude trait was associated with feeling obliged to repay only in gift situation ($r = .18, p < .05$) and low-cost situation ($r = .28, p < .01$).

To summarize, both gratitude and indebtedness traits had positive associations with corresponding emotions, and the association between indebtedness trait and feeling owing others was stronger. The trait-emotion associations was found to be specific, that is gratitude trait was not correlated with feeling owing others and indebtedness trait was not correlated with feeling thankful. Both traits were found to be associated with feeling

obliged to repay, with more associations found between indebtedness trait and feeling obliged to repay.

Table 6.12 Correlations between traits and emotions in the situations of Study 2a and Study 2b

	Thankful	Owing others	Obliged to repay
<i>Study 2a</i>			
Gift situation			
Gratitude trait	.15	.03	.18*
Indebtedness trait	.05	.44***	.10
Helping situation			
Gratitude trait	.18	-.10	.15
Indebtedness trait	.00	.30**	.20*
<i>Study 2b</i>			
Low-cost situation			
Gratitude trait	.25**	.01	.28**
Indebtedness trait	.02	.31**	.26**
High-cost situation			
Gratitude trait	.34***	-.07	.08
Indebtedness trait	.03	.21*	.21*

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

6.4.3 Effects of traits and emotions of gratitude and indebtedness on prosocial motivation

In order to address the important research question, i.e., how traits and emotions affect prosocial motivation under different expectation conditions, a series of multiple linear regression analysis were conducted to predict prosocial motivation using gratitude and indebtedness traits, feeling thankful, owing others, and obliged to repay as predictors. Since there were no substantial correlations found between demographic variables and other key variables, gender and age were not included as predictors. The composite variable of prosocial motivation was used as the criterion. Under each of the three

different conditions, the regression analysis was conducted in two steps using the same “enter” procedure. Step 1 used gratitude trait and indebtedness trait as predictors (Set 1 predictors) to evaluate whether trait factors could contribute significantly to the criterion without invoking the Set 2 predictors of three emotions. Step 2 used two ordered sets of predictors, with Set 1 predictors entered first, followed by Set 2 predictors and the changes in R^2 and F were assessed to evaluate whether the Set 2 predictors predicted the criterion measure over and above the Set 1 predictors. Table 6.13 and 6.14 summarize the results of the regression analysis for V1 (gift situation) and V2 (helping situation) respectively.

From Table 6.13, it can be seen that for No-expectation condition, gratitude trait significantly predicted prosocial motivation, explaining 32% of the variance. Adding emotional variables improved the prediction, explaining additional 21% of the variance. Feeling thankful and gratitude trait were substantially significant predictors for prosocial motivation. Indebtedness trait and emotions were found to have no significant associations with prosocial motivation under all three conditions.

The results under the Expectation condition were slightly different. Among the Set 1 predictors, gratitude trait was significant but less strong in predicting prosocial behaviors (explained 20% of the variance) comparing with No-expectation condition. The addition of Set 2 predictors improved in prediction and accounted for additional 19% of the variance. Again, gratitude trait and feeling thankful were found to be the significant predictors, although feeling thankful was a much weaker predictor. The results indicated that when given a gift with explicit expectation of repayment communicated by the

benefactor, participants' reported gratitude trait became more important factor than their feeling of thankfulness to predict the level of willingness to act prosocially in the future.

Under ambiguous condition, however, dispositional trait was found to be the only significant predictor. The set of trait variables explained 26% of the variance and the variables of feelings explained additional 20% of the variance. It suggested that when participants were given ambiguous information regarding whether or not they were expected to return the favor, their prosocial motivation was associated more strongly with their gratitude disposition than their feeling of thankfulness.

Table 6.13 Summary of multiple regression analyses for the prediction of prosocial motivation using predictors of gratitude and indebtedness traits, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three benefactor expectation conditions in V1 (gift situation)

	Variable	B	SE B	β	R ²	R ² change	F	F change
<i>No-expectation (n = 42)</i>								
Step 1					.32		9.20**	
	Gratitude trait	.31	.07	.57***				
	Indebtedness trait	-.03	.08	-.05				
Step 2					.54	.21	8.27***	5.52**
	Gratitude trait	.23	.07	.43**				
	Indebtedness trait	-.07	.09	-.11				
	Feeling thankful	1.29	.37	.44**				
	Feeling like owing	.02	.26	.01				
	Feeling obliged to repay	.25	.26	.12				
<i>Expectation (n = 37)</i>								
Step 1					.20		4.22*	
	Gratitude trait	.28	.10	.44**				
	Indebtedness trait	-.05	.10	-.08				
Step 2					.39	.19	3.96**	3.24*
	Gratitude trait	.26	.09	.41**				
	Indebtedness trait	-.10	.10	-.15				
	Feeling thankful	.58	.23	.37*				
	Feeling like owing	.36	.21	.25				
	Feeling obliged to repay	.09	.24	.06				
<i>Ambiguous (n = 44)</i>								
Step 1					.26		7.30**	
	Gratitude trait	.26	.07	.52***				
	Indebtedness trait	-.02	.07	-.04				
Step 2					.46	.20	6.51***	4.67**
	Gratitude trait	.22	.06	.45**				
	Indebtedness trait	-.09	.07	-.19				
	Feeling thankful	.39	.28	.17				
	Feeling like owing	.19	.22	.17				
	Feeling obliged to repay	.44	.29	.28				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 6.14 summarized the regression analysis results in the helping situation. The results were found to be similar. Under No-expectation and Expectation conditions, gratitude trait and feeling thankful were found to be the significant predictors for prosocial motivation. Again, gratitude trait was a more substantially stronger predictor than feeling thankful under Expectation condition. Under ambiguous condition, like the gift situation, gratitude trait was found to be the only significant predictor for prosocial

motivation. Indebtedness trait and emotions were again found to have no significant associations with prosocial motivation for each of the three conditions.

Table 6.14 Summary of multiple regression analyses for the prediction of prosocial motivation using predictors of gratitude and indebtedness traits, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three benefactor expectation conditions in V2 (helping situation)

Variable	B	SE B	β	R ²	R ² change	F	F change
<i>No-expectation (n = 42)</i>							
Step 1				.27		7.19**	
Gratitude trait	.29	.08	.51**				
Indebtedness trait	-.12	.09	-.18				
Step 2				.47	.20	6.27***	4.39*
Gratitude trait	.22	.09	.38*				
Indebtedness trait	-.10	.10	-.15				
Feeling thankful	.87	.38	.33*				
Feeling like owing	.00	.29	.00				
Feeling obliged to repay	.57	.29	.27				
<i>Expectation (n = 37)</i>							
Step 1				.25		5.55**	
Gratitude trait	.39	.12	.48**				
Indebtedness trait	.07	.12	.09				
Step 2				.52	.27	6.84***	6.04**
Gratitude trait	.40	.10	.50***				
Indebtedness trait	.02	.10	.03				
Feeling thankful	.85	.30	.43**				
Feeling like owing	.14	.34	.06				
Feeling obliged to repay	.33	.38	.14				
<i>Ambiguous (n = 44)</i>							
Step 1				.32		9.83***	
Gratitude trait	.31	.07	.58***				
Indebtedness trait	-.06	.07	-.12				
Step 3				.43	.11	5.79***	2.42
Gratitude trait	.23	.09	.43*				
Indebtedness trait	-.12	.07	-.23				
Feeling thankful	.56	.43	.21				
Feeling like owing	.15	.17	.13				
Feeling obliged to repay	.33	.19	.23				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Similar sets of regression analysis applied to Study 2b to answer the research question: how traits and emotions of gratitude and indebtedness influence prosocial motivation

under different condition of help initiation? The Table 6.15 and Table 6.16 summarized the results in V1 (low-cost situation) and V2 (high-cost situation) respectively.

It can be seen from Table 6.15 that, under Request condition, trait variables predicted prosocial motivation, explaining 37% of the variance, gratitude trait being the significant predictor. The additional predictors of three feelings yielded better prediction and accounted for a significantly greater proportion of variance (additional 32%) in predicting prosocial motivation. Feeling thankful was found to be the most significant predictor. Gratitude trait and feeling obliged to repay were also found to be the significant predictors, with less substantial significance. Indebtedness trait and emotions were not significantly correlated with prosocial motivation. The results indicated that in the situation where participants asked for help and caused benefactor's relatively low costs, the more they felt thankful, the more they reported on future prosocial motivation. Participants being more grateful or feeling more obliged to repay also reported higher future prosocial motivation.

Under Offer condition, gratitude was also found to be a significant predictor, explaining 33% of the variance. Adding emotion variables did not significantly improved the prediction, only explained additional 6% of the variance. Gratitude trait was the only significant predictor for prosocial motivation, indicating that when participants were offered the book they needed, the more grateful they were, the more willingly they reported for offering future helping behaviors. Again, indebtedness trait and emotions were not significantly correlated with prosocial motivation.

Under Ambiguous condition, trait factor did not significantly contributed to the prediction, although gratitude trait was approaching significance level ($p = .066$),

explaining 9% of the variance. Adding emotional variables yielded better prediction, explaining additional 23% of the variance. Feeling owing was found to be the only slightly significant predictor. Feeling thankful was also similarly contributed to the prediction, with a level approaching significance ($p = .055$).

Table 6.15 Summary of multiple regression analyses for the prediction of prosocial motivation using predictors of gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay for each of three help initiation conditions in V1 (low-cost situation)

Variable	B	SE B	β	R^2	R^2 change	F	F change
<i>Request (n = 41)</i>							
Step 1				.37		11.20***	
Gratitude trait	.41	.09	.64***				
Indebtedness trait	-.25	.13	-.26				
Step 2				.69	.32	15.40***	11.82***
Gratitude trait	.20	.07	.32**				
Indebtedness trait	-.18	.10	-.18				
Feeling thankful	2.14	.48	.49***				
Feeling owing	-.32	.24	-.14				
Feeling obliged to repay	.73	.26	.31**				
<i>Offer (n = 42)</i>							
Step 1				.33		9.47***	
Gratitude trait	.34	.08	.59***				
Indebtedness trait	-.03	.08	-.05				
Step 2				.39	.07	4.64**	1.28
Gratitude trait	.31	.09	.54**				
Indebtedness trait	-.07	.10	-.12				
Feeling thankful	.32	.44	.11				
Feeling owing	-.13	.22	-.09				
Feeling obliged to repay	.48	.30	.25				
<i>Ambiguous (n = 43)</i>							
Step 1				.09		1.89	
Gratitude trait	.14	.07	.30				
Indebtedness trait	-.07	.07	-.16				
Step 2				.32	.23	3.41*	4.12*
Gratitude trait	.12	.08	.27				
Indebtedness trait	-.06	.07	-.14				
Feeling thankful	.54	.27	.28				
Feeling owing	.40	.19	.33*				
Feeling obliged to repay	.15	.30	.08				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

From Table 6.16 which described the results in the high-cost situation, it can be seen that under Request condition, gratitude trait was again found to be the most substantial and significant predictor among others, together with the negative contribution of indebtedness trait, accounting for 36% of the variance. Additional feeling variables yielded a better prediction and accounted for 36% of variance. Feeling thankful and obliged to repay were found to be the most substantial predictors. Gratitude trait was largely suppressed to be weaker than the feelings but still a significant predictor. Indebtedness trait was found to be a slightly significant and negative predictor for predicting less prosocial motivation.

Under Offer condition, the results were similar to the low-cost situation. Gratitude was found to be the only significant predictor explaining 28% of the variance. Additional emotion variables explained 7% of the variance with no additional significant predictors emerged.

Under Ambiguous condition, gratitude trait was found to be the only significant predictor, explaining 17% of the variance. Additional emotion variables explained 15% of the variance but no emotion variable was found to be a significant predictor.

Table 6.16 Summary of multiple regression analyses for the prediction of prosocial motivation using predictors of gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay for each of the three help initiation conditions in V2 (high-cost situation)

Variable	B	SE B	β	R ²	R ² change	F	F change
<i>Request (n = 41)</i>							
Step 1				.36		10.58***	
Gratitude trait	.37	.08	.63***				
Indebtedness trait	-.22	.12	-.24				
Step 2				.72	.36	18.19***	15.30***
Gratitude trait	.19	.07	.33**				
Indebtedness trait	-.21	.08	-.25*				
Feeling thankful	1.11	.33	.41**				
Feeling owing	-.17	.18	-.09				
Feeling obliged to repay	.90	.24	.41**				
<i>Offer (n = 42)</i>							
Step 1				.28		7.52**	
Gratitude trait	.26	.07	.54**				
Indebtedness trait	-.03	.07	-.06				
Step 2				.35	.07	3.81**	1.24
Gratitude trait	.29	.07	.61***				
Indebtedness trait	-.10	.08	-.21				
Feeling thankful	.23	.40	.08				
Feeling owing	.11	.20	.09				
Feeling obliged to repay	.36	.26	.23				
<i>Ambiguous (n = 43)</i>							
Step 1				.17		4.12*	
Gratitude trait	.22	.08	.43**				
Indebtedness trait	-.10	.07	-.21				
Step 2				.32	.15	3.44*	2.64
Gratitude trait	.20	.08	.40*				
Indebtedness trait	-.12	.07	-.24				
Feeling thankful	.11	.40	.05				
Feeling owing	.21	.31	.15				
Feeling obliged to repay	.40	.35	.24				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Summary

Gratitude trait was consistently found to be a significant predictor for prosocial motivation under nearly all conditions of the four different situations, suggesting that students having higher dispositional gratitude were more willingly to engage in prosocial behaviors in the future regardless of the different types of situations. Gratitude

disposition was found to be the only significant predictor for prosocial motivation under ambiguous conditions. Indebtedness trait, however, was consistently found to have no significant correlation with prosocial motivation.

Under the conditions of different expectation to return, students' prosocial motivation was associated with similar sets of factors for both gift and helping situation. Specifically, students who were more grateful and felt more thankful when received a favor without being expected to repay reported more willingness to act prosocially in the future. When being expected to repay, more grateful students reported higher prosocial motivation. To a lesser extent, the students felt more thankful also reported higher level of prosocial motivation.

Under the condition of different help initiation, the results were slightly different. In the two situations involved benefactor's costs, feeling obliged to repay was also found to be a significant predictor in addition to feeling thankful and gratitude trait when one requested for help. When being offered help, more grateful students reported higher prosocial motivation in both situations.

6.4.4 Effects of traits and emotions of gratitude and indebtedness on reciprocation

To examine how traits and emotions affect reciprocation under different experimental conditions, similar series of multiple regression analysis were conducted. Table 6.17 and 6.18 summarized the regression analysis results in the situation of receiving a gift and receiving help respectively.

In gift situation, the results for each of the three conditions indicated that gratitude trait did not contribute significantly for predicting the magnitude of reciprocation. Specifically, gratitude trait contributed comparatively greater to how much participant

would reciprocate under No-expectation condition, explaining 9% of the variance, than Expectation condition (2%) and Ambiguous condition (4%). Under No-expectation condition, feeling thankful was found to be a significant predictor for reciprocation, explaining additional 18% of the variance, indicating that when participants were given a gift without being expected to return, the more they felt thankful, the higher proportion of amount of money they reported they would spend to buy a gift for the benefactor when given a chance. For both Expectation condition and Ambiguous condition, no set of predictors was found to be significant ($F_s < 2.12; p > .05$). However, feeling like owing was found to be a significant predictor under Expectation condition, explaining additional 20% of the variance. The results indicated that when participants were asked to repay after receiving a gift, the more they felt owing the benefactor, the more they would pay for buying a gift in return. Feeling obliged to repay was the only significant predictor under Ambiguous condition, explaining additional 18% of the variance, suggesting that when no clear information of repayment expectation was available, the more they felt obliged to repay, the more they reported they would pay for buying a gift for repayment.

Table 6.17 Summary of multiple regression analyses for the prediction of the magnitude of reciprocation using predictors of gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three benefactor expectation conditions in V1 (gift situation)

Variable		<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	<i>R</i> ² change	<i>F</i>	<i>F</i> change
<i>No-expectation (n = 42)</i>								
Step 1					.09		1.81	
	Gratitude trait	.06	.03	.28				
	Indebtedness trait	.02	.04	.06				
Step 2					.27	.18	2.61*	2.96*
	Gratitude trait	.04	.03	.20				
	Indebtedness trait	-.03	.05	-.10				
	Feeling thankful	.49	.19	.40*				
	Feeling like owing	.18	.13	.26				
	Feeling obliged to repay	-.09	.14	-.11				
<i>Expectation (n = 37)</i>								
Step 1					.02		.31	
	Gratitude trait	.08	.05	.30				
	Indebtedness trait	.06	.05	.21				
Step 2					.22	.20	1.73	2.65
	Gratitude trait	.04	.04	.17				
	Indebtedness trait	-.05	.04	-.20				
	Feeling thankful	.01	.10	.02				
	Feeling like owing	.26	.09	.47**				
	Feeling obliged to repay	-.03	.11	-.06				
<i>Ambiguous (n = 44)</i>								
Step 1					.04		.83	
	Gratitude trait	.02	.04	.09				
	Indebtedness trait	.04	.04	.16				
Step 3					.22	.18	2.12	2.90*
	Gratitude trait	.02	.04	.06				
	Indebtedness trait	.03	.04	.12				
	Feeling thankful	-.14	.18	-.12				
	Feeling like owing	-.18	.14	-.31				
	Feeling obliged to repay	.49	.18	.69*				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

In Table 6.18, the results for the helping situation were different. Gratitude trait seemed to play a more important role in predicting reciprocation than in gift situation. Under No-expectation condition, gratitude trait in Set 1 predictors significantly predicted the magnitude of reciprocation, explaining 12% of the variance. The addition of Set 2 predictors yielded better prediction than using Set 1 predictors alone and accounted for additional 18% of the variance. Gratitude trait was still the only significant predictor for

reciprocation. The results indicated that in the situation where participants received other's help, the higher they scored on gratitude trait, the more they would spend time to help the benefactor when given a chance.

Under Expectation condition, the two sets of variables did not significantly predict the magnitude of reciprocation. However, some trend of associations can be found. Trait factors contributed to the prediction of reciprocation, explaining 11% of the variance, in which gratitude trait contributed more than indebtedness trait. Additional emotion variables improved the prediction, explaining additional 10% of the variance. Feeling obliged to repay emerged to the predictor that contributed the most, which was approaching significance level ($p = .083$).

When looking at the Ambiguous condition, it was found that the two sets of trait and emotion variables only explained 3% of the variance. Therefore, it seemed that when participants were given unclear information about whether or not they were expected to reciprocate after receiving other's help, their traits and emotions can hardly influence how much they would repay when given a chance.

Table 6.18 Summary of multiple regression analyses for the prediction of the magnitude of reciprocation using predictors gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three benefactor expectation conditions in V2 (helping situation)

	Variable	B	SE B	β	R ²	R ² change	F	F change
<i>No-expectation (n = 42)</i>								
Step 1					.12		2.61	
	Gratitude trait	.08	.04	.32*				
	Indebtedness trait	.02	.04	.08				
Step 2					.30	.18	3.03*	3.03*
	Gratitude trait	.08	.04	.34*				
	Indebtedness trait	-.01	.05	-.02				
	Feeling thankful	.20	.18	.19				
	Feeling like owing	.20	.14	.28				
	Feeling obliged to repay	.12	.13	.14				
<i>Expectation (n = 37)</i>								
Step 2					.11		2.00	
	Gratitude trait	.07	.04	.27				
	Indebtedness trait	.05	.04	.17				
Step 3					.21	.10	1.64	1.36
	Gratitude trait	.06	.04	.22				
	Indebtedness trait	.04	.04	.15				
	Feeling thankful	-.02	.13	-.03				
	Feeling like owing	-.16	.15	-.19				
	Feeling obliged to repay	.30	.17	.36				
<i>Ambiguous (n = 44)</i>								
Step 2					.02		.39	
	Gratitude trait	.02	.03	.08				
	Indebtedness trait	-.03	.03	-.13				
Step 3					.03	.01	.20	.10
	Gratitude trait	.03	.04	.13				
	Indebtedness trait	-.03	.04	-.14				
	Feeling thankful	-.06	.22	-.05				
	Feeling like owing	.04	.09	.08				
	Feeling obliged to repay	-.03	.10	-.05				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Similarly, two sets of multiple regression analysis were conducted to examine the effect of traits and emotions on reciprocation under different conditions in Study 2b. Table 6.19 and Table 6.20 summarized the results for low-cost and high-cost situation respectively. From Table 6.19, it can be seen that in low-cost situation, under Request condition, Set 1 predictors of traits did not predict reciprocation. The addition of Set 2 predictors yielded better prediction and accounted for additional 24% of variance.

Although the whole set of variables did not significantly predict reciprocation ($F = 2.15$, $p = .083$), feeling thankful was found to be a significant predictor, indicating that when taking initiative to request for a book, the more students felt thankful after receiving the book, the more they would spend time in helping the benefactor in return.

The results under Offer condition were different. Traits were found to significantly contribute in predicting participants' magnitude of reciprocation, accounting for 18% of the variance. Gratitude and indebtedness traits were found to similarly contribute to the prediction, both approaching the significance level. The addition of emotion predictors did not significantly contribute for the improvement of prediction, accounted for additional 7% of the variance. All the predictors were non-significant.

Under Ambiguous condition, however, the whole set of variable only accounted for 2% of the variance. Therefore, both traits and emotions failed to predict the magnitude of reciprocation when participants did not clearly know the locus of help initiation.

Table 6.19 Summary of multiple regression analyses for the prediction of the magnitude of reciprocation using predictors of gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three help initiation conditions in V1 (low-cost situation)

Variable	B	SE B	β	R ²	R ² change	F	F change
<i>Request (n = 41)</i>							
Step 1				.00		.04	
Gratitude trait	.00	.03	-.01				
Indebtedness trait	.01	.05	.05				
Step 2				.24	.24	2.15	3.55*
Gratitude trait	-.05	.04	-.27				
Indebtedness trait	.03	.05	.09				
Feeling thankful	.56	.23	.41*				
Feeling owing	-.04	.12	-.06				
Feeling obliged to repay	.19	.13	.26				
<i>Offer (n = 42)</i>							
Step 1				.18		4.43*	
Gratitude trait	.06	.03	.27				
Indebtedness trait	.06	.03	.26				
Step 2				.25	.07	2.43	1.08
Gratitude trait	.06	.03	.29				
Indebtedness trait	.03	.04	.12				
Feeling thankful	-.05	.18	-.04				
Feeling owing	.01	.09	.02				
Feeling obliged to repay	.21	.12	.29				
<i>Ambiguous (n = 43)</i>							
Step 1				.01		.25	
Gratitude trait	.02	.04	.10				
Indebtedness trait	-.02	.04	-.09				
Step 2				.03	.02	.25	.26
Gratitude trait	.02	.05	.08				
Indebtedness trait	-.02	.04	-.07				
Feeling thankful	.14	.18	.13				
Feeling owing	.02	.12	.03				
Feeling obliged to repay	.02	.19	.02				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

The results for the high-cost situation from Table 6.20 were different. It can be seen that under Request condition, traits did not contribute to the prediction, accounting for only 4% of the variance. Additional emotion variables yielded better prediction, explaining 24% of the variance. Feeling obliged to repay was found to be the significant predictor for reciprocation, indicating that when participants initiated to ask for other's

help to solve some math problems, the more they felt obliged to repay, the more amount of time they would spend to help the benefactor in return.

Under Offer condition, traits did not significantly contributed to the predication, explained 11% of the variance. Additional emotion variables also did not significantly improved the prediction, only accounted for 4% of the variance.

Under Ambiguous condition, it was again found that both sets of trait and emotion variables did not significantly predict reciprocation. Trait variables explained 11% of the variance, and indebtedness trait negatively predicted for reciprocation. Emotion variables accounted for additional 10% of the variance. Indebtedness trait continued to be the only significant predictor for less reciprocation, indicating that when the locus of help initiation was unclear, the more indebted they were, the less they tended to reciprocate.

Table 6.20 Summary of multiple regression analyses for the prediction of the magnitude of reciprocation using predictors of gratitude and indebtedness trait, feeling thankful, feeling like owing, and feeling obliged to repay under each of the three help initiation conditions in V2 (high-cost situation)

Variable	B	SE B	β	R ²	R ² change	F	F change
<i>Request (n = 41)</i>							
Step 1				.04		.85	
Gratitude trait	.00	.03	-.02				
Indebtedness trait	-.06	.05	-.20				
Step 2				.29	.24	2.82*	3.99*
Gratitude trait	-.01	.04	-.06				
Indebtedness trait	-.06	.04	-.21				
Feeling thankful	-.07	.17	-.07				
Feeling owing	.08	.10	.15				
Feeling obliged to repay	.32	.13	.45*				
<i>Offer (n = 42)</i>							
Step 1				.11		2.40	
Gratitude trait	.02	.04	.07				
Indebtedness trait	.08	.04	.30				
Step 2				.15	.04	1.27	.57
Gratitude trait	.03	.04	.12				
Indebtedness trait	.05	.05	.18				
Feeling thankful	.12	.24	.08				
Feeling owing	.08	.12	.12				
Feeling obliged to repay	.11	.16	.13				
<i>Ambiguous (n = 43)</i>							
Step 1				.11		2.58	
Gratitude trait	-.01	.04	-.03				
Indebtedness trait	-.08	.04	-.33*				
Step 2				.21	.10	2.01	1.57
Gratitude trait	-.01	.05	-.02				
Indebtedness trait	-.09	.04	-.37*				
Feeling thankful	-.02	.22	-.02				
Feeling owing	.10	.18	.13				
Feeling obliged to repay	.19	.20	.22				

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Summary

In predicting the magnitude of reciprocation, traits and emotions were generally found to be substantially weak predictors. In gift situation, when not being expected to repay, the more students felt thankful, the more they spent for buying a gift for the benefactor; when being expected to repay, however, the more students felt owing the

benefactor, the more they spent for repayment; when benefactor's expectation was not clearly known, the more students felt obliged to repay, the more they reported on reciprocation.

In helping situation, when not being expected to repay, more grateful students reported more in spending time to help the benefactor; under expectation and ambiguous condition, students' reciprocation can hardly be predicted by traits and emotions.

Under the different conditions of help initiation, the results were different. In the low-cost situation, when requesting for help, students who felt more thankful reported more time for helping the benefactor in return. Under offer and ambiguous condition, traits and emotions failed to significantly predict how much students reciprocated.

In the high-cost situation, when requesting for help in solving math problems, students who felt more obliged to repay reported more time to help in return. Again, under offer and ambiguous condition, traits and emotions failed to significantly predict reciprocation.

Chapter 7 Discussion and Conclusions

This study consisted of one survey and two experiments to examine the relationships between gratitude and indebtedness at both trait and emotion levels among Chinese young adolescents in Hong Kong. The survey study treated gratitude and indebtedness at dispositional level and the experiments attempted to elicit them at situational level utilizing scenarios.

At the dispositional level, the study examined whether or not gratitude and indebtedness can be differentiated as two separate dispositional traits and how they are differentially related to subjective well-being and helping tendencies. At the situational level, the study explored the possible different emotional valence of feeling thankful, owing others, and obliged to repay, and investigated whether or not different conditions of expectation to return and of help initiation can disassociate feeling thankful, owing others, and obliged to repay, and whether the completion of repayment caused feeling thankful and owing others to change differently. In addition, the study investigated trait-emotion relationship and how gratitude and indebtedness as traits and emotions affected prosocial motivation and the magnitude of reciprocation.

Through two levels of analysis, this study yielded interesting results corresponding to the above research endeavors. In the following section, I highlight the main findings of the present study in order to understand the relationship between gratitude and indebtedness, and discuss the implications of the results for advancement of theoretical development and for practical applications. Finally, I draw some conclusions and indicate promising research orientations for future work.

7.1 Disassociations

This study provided considerable evidence indicating the disassociations between gratitude and indebtedness, including empirical differentiations of gratitude and indebtedness as two separate dispositions or traits and their differential associations with subjective well-being and helping tendencies, different emotional valence, the effect of benefactor's expectation to return and the effect of reciprocation on how the emotions varied, the independency of emotional states, the specificity of trait-emotion relationships, and how traits and emotions of gratitude and indebtedness affected prosocial motivation and reciprocation differently.

Two separate dispositions

In the survey study, based on the factor analysis of the correlations among perceived affective traits of gratitude and indebtedness in the first sample of students, two interpretable dimensions emerged, suggesting that gratitude and indebtedness were perceived as distinct among the Chinese young adolescents in Hong Kong. Confirmatory factor analysis to compare different dimensional models for the second sample of students further confirmed the distinctness of the two traits. The results indicated that Chinese young people aged 9 to 15 understood and responded to the items measuring gratitude and indebtedness differently and there were individual differences on dispositional gratitude and indebtedness among them. Some students reported more frequency and intensity to feel grateful or thankful for more life situations and toward more people than other students. Likewise, some students reported more proneness to feel owing others than other students, demonstrated by more easily and readily to feel like

owing others, more intensely in experiencing the feeling, and feeling owing others in more various circumstances and for a wider variety of people.

On average, students reported higher level of dispositional gratitude than dispositional indebtedness. Girls scored higher on dispositional gratitude than boys but there was no gender difference on dispositional indebtedness. The results were consistent and stronger than Froh, Yurkewicz, and Kashdan (2008)'s finding on American adolescents, in which American girls were found to report higher dispositional gratitude than boys.

Indeed, gratitude "involves noticing and acknowledging a benefit's value and meaning, and feeling a positive emotional connection to it" (Adler & Fagley, 2005, p. 79). However, indebtedness implies the benefit recipient's focus on equity (Greenberg, 1980), and feeling socially inadequate of owing others which has mild negative tone. Mathews and Green (2009)'s explanation toward why gratitude and indebtedness are two distinct traits is particularly relevant. They claimed that focusing on inner feelings and thoughts as opposed to objects and people outside distinguishes indebtedness and gratitude. People who are more inclined to feel owing others when receiving a benefit might often focus more inwardly on self-judgment or whether they would be negatively evaluated by others as socially inappropriate and on the need to repay the favor.

Differential associations with subjective well-being

Consistent with earlier findings with adults in western countries (McCullough, et al., 2002; Watkins, et al., 2003), it was found that more grateful Chinese young adolescents reported substantially higher level of satisfaction with life, more positive affect, and less negative affect experienced in daily lives than their less grateful counterparts. However,

indebtedness disposition was found to have different associations. Students' dispositional indebtedness significantly predicted lower level of life satisfaction and more negative emotions. Indebtedness trait was not reliably associated with positive affect.

The associations were generally in different valence, suggesting that dispositional gratitude can be uplifting to young people's well-being whereas dispositional indebtedness can be somewhat diminishing. However, it has to be noted that while the correlations between indebtedness and life satisfaction was statistically significant, it was of low magnitude, suggesting that unlike dispositional gratitude being a strong predictor for life satisfaction, dispositional indebtedness might be a relatively weak predictor of low evaluation for life satisfaction. The significant and moderate association between indebtedness disposition and negative affect suggests the vulnerability to experience negative feelings in daily lives for those more dispositionally indebted young adolescents. Note that the result did not support the hypothesized negative correlation between dispositional indebtedness and positive affect. Near zero correlation between the two suggests that although being associated with negative affect, dispositional indebtedness does not necessarily preclude positive affect. Gratitude and indebtedness are not mutually exclusive and the upside of indebtedness might bring about positive emotions too.

Differential associations with helping tendencies

As hypothesized, gratitude was revealed to be the strongest predictor but indebtedness was the one that predicted lower helping tendencies. The findings suggest that more grateful young people are more likely to go out of their way to help others and feel helping processes more enjoyable than less grateful ones, whereas more indebted young people are somewhat less likely to initiate to help others and less likely to enjoy in

helping. This provided a direct evidence for the “moral motivator” hypothesis proposed by McCullough and his colleagues (2001) that gratitude motivates people to engage in prosocial behaviors. The results are particularly encouraging given that gratitude works as a moral motivator not only for adults but also among the young populations since their primary school years. The significant but small magnitude of association between dispositional indebtedness and helping tendencies suggests that dispositionally indebted young people might be less active and more cautious to voluntarily engage in prosocial behaviors and in general this association is substantially weaker than the association between gratitude and helping tendencies. The results also could be viewed as an indirect evidence for Schaumberg and Flynn (2009)’s proposition that gratitude and indebtedness differ in “want to” or “love to” versus “have to” response to act prosocially. The relatively lower helping tendencies suggest the reluctance and less enjoyment that the dispositional indebted young people might generally experience in social giving and receiving processes.

Different emotional valence

The study yielded rich information on how feeling thankful, owing others, and obliged to repay related with other emotional responses elicited in various situations, which allow us to understand how young people might perceive the emotional states of gratitude and indebtedness differently in different social circumstances. Feeling thankful was consistently perceived to be positive whereas feeling owing others and obliged to repay generally had mixed affective associations in four different situations (i.e., receiving a birthday gift, receiving other’s help, situation involving benefactor’s high

costs and involving benefactor's low costs) among Chinese young adolescents in Hong Kong.

Specifically, feeling thankful was consistently found to positively correlate with "cared" and with "happy" in most situations suggesting that feeling thankful is a pleasant emotion based on recognizing and acknowledging the positive regard from others. The negative association with "*Wu-Nai*" suggests that feeling thankful is an enabling emotion, i.e., the more thankful one feels, the less likely one might have a feeling of being unable to do anything. Feeling owing others was generally found to be perceived as a mixed feeling having relatively strong associations with negative emotions such as "guilty" and "uneasy", suggesting that the emotional state of owing others is felt primarily self-condemning and unpeaceful although not purely negative. Feeling obliged to repay seemed to be felt more positive, even having solely positive affective associations in a similar pattern with feeling thankful in the situation of receiving other's help.

The results highlight the importance to view the emotional states of gratitude and indebtedness to be distinct for the reason that they were generally experienced as having different emotional valence among young adolescents. It further suggests that feeling thankful, owing others, and obliged to repay might be perceived differently in different situations. When given unexpected favor addressing to meet one's pressing needs (helping situation in Study 2a), feeling obliged to repay was similarly positive (although less strongly positive) with feeling thankful. In addition, when introducing salient costs on the benefactor's side (in Study 2b) all three feelings were felt comparatively less positive.

The finding that feeling obliged to repay was generally found to be more positive than feeling owing others was not consistent with Watkins and his colleagues (2006)'s results, in which they found the feeling of obligated to repay had more negative associations than feeling indebted (defined as "feeling like you owe" p.230, Watkins et al, 2006). The difference might reflect the influence of Chinese culture of *Bao-en* on young adolescents. The state of owing others might be felt as a more aversive psychological state for Chinese than western people because not-yet-repaid status might indicate moral inadequacy or even wrongness for Chinese people. Moreover, obligation to repay viewed to be more positive might be due to the reason that social obligation is generally perceived to be more positive in collective cultures such as in the Chinese culture.

Disassociation by benefactor expectation for repayment

Across the two parallel experiments, the results show a clear disassociation by different conditions of benefactor expectation to return. Under the condition of no expectation for repayment, participants felt significantly higher level of feeling thankful than feeling obliged to repay; when benefactor's expectation was explicitly known, participants' feeling thankful dropped dramatically, lower than reported feeling obliged to repay. They responded with the lowest level of feeling owing others. It seems that if gifts are given for the purpose to get repayment, the beneficiary is less likely to feel thankful but more likely to feel the obligation for repayment. If a benefit is given to address the beneficiary's needs and wishes without any manipulative intentions, the beneficiary is more likely to respond with heightened feeling thankful than obliged to repay.

Compared with their responses of feeling owing others or obliged to repay, young adolescents' feeling thankful was found to be most sensitive to whether or not they were expected to repay. However, the change patterns of the three feelings were similar, i.e., their responses of feeling thankful, owing others, and obliged to repay all decreased when they were asked for repayment than when they were not asked to repay. The result is different from Watkins et al. (2006)'s in that they found gratitude decreased but indebtedness increased as a result of explicit expectation to return. One possible explanation for the result of the present study is that although the three emotional states were generally felt differently, they shared some common positive elements such as the feeling of being cared and happy. When being aware of the benefactor's intention to get repayment, the beneficiary's emotion of being cared and happy decreased thus leading to the decrease of the three emotions to different degrees. In Chinese, "feeling owing others" was translated into "*Qian-Qing* (欠情)", literally meaning that one owes others a debt of affection. Affection might be the common basis for feeling thankful, owing others, and obliged to repay. When getting to know the benefactor's selfish intention, the young adolescents might feel less affection or benevolence from the benefactor, thus leading to a decreased feeling of owing others and obligation to repay accordingly. The results of manipulation check on the different emotional responses of "happy" and "annoyed" supported the explanation.

Different change patterns after reciprocation

The effect of reciprocation was proved to be a key factor to disassociate gratitude and indebtedness. However, the disassociation depends on the quality of situations. When young adolescents completed their repayment under the situations of receiving a birthday

gift and of receiving others' help, their feeling of thankfulness increased or remained the same, but their reported feeling of owing others decreased. However, when young adolescents completed their repayment under the situations involving benefactor's salient costs, their feelings of both thankfulness and owing others decreased. Affective association analysis show that when the cost of benefactor was made salient to the beneficiary, the thankful responses of the beneficiary was felt less enjoyable than in the situations demonstrating benefactor's benevolence without mentioning any costs. Feeling thankful was not associated with feeling happy in high-cost situation and only slightly associated with feeling happy in low-cost situation. Therefore, the enjoyment of young people's feeling thankful seems to be somewhat "ruined" by the costs, even if the costs were on the benefactor's side. Less pleasant or milder pleasantness might tend to decrease with the completion of repayment. In addition, similar to feeling owing others, feeling thankful was also found to significantly and positively correlate with feeling *Bu-Hao-Yi-Si* for causing a problem in both high- and low-cost situations. Therefore, it is also plausible that when the young adolescents completed the reciprocation, their feeling of *Bu-Hao-Yi-Si* dissipated, leading to diminished feeling thankful as well. The results suggest that it is of great importance to understand how situational factors could influence the emotional change of gratitude and indebtedness differently after reciprocation, and further understanding of the dynamics of gratitude and indebtedness should be pursued.

Independent emotional states of gratitude and indebtedness

The results show that after controlling the common variance of other emotions such as "cared", "happy" and "*Bu-Hao-Yi-Si*", feeling thankful was found to be relatively

independent from feeling owing others and from feeling obliged to repay. Feeling owing others and feeling obliged to repay still consistently and significantly correlated with each other after controlling the common variables.

The results show the advantage of making use of the information of affective associations with both positive and negative emotional responses to understand how gratitude and indebtedness as emotional states interact with each other. Through taking away the influence of other common variables of emotions, the positive and significant correlations were suppressed to be non-significant or approaching zero. The results might serve to explain that a wide range of variation in the correlations between gratitude and indebtedness showed in past research might be due to situational factors. It seems that in some situations, the three emotions correlated more strongly with each other than in other situations. For instance in the present study, the correlations were stronger in helping situation where the three emotions overlapped with “cared” and “happy” and in high-cost situation where they overlapped with “cared” and “*Bu-Hao-Yi-Si*”. Admittedly, situational factors that can influence the association of gratitude and indebtedness are complicated. A no-correlation conclusion between feelings of gratitude and indebtedness seems to be premature given that four situations were included in the present study.

Trait-emotion relationship

The results yielded a consistent significant association between dispositional indebtedness and feeling owing others regardless of different situations, suggesting that more dispositionally indebted young adolescents tend to report high level of feeling owing others and obliged to repay no matter what situations they encounter. The association between gratitude trait and feeling thankful were found to be slightly or

moderately positive, significant in some situations, but not in others. Specifically, in the situations where participants were expected to repay, their feeling thankful was not associated with their dispositional gratitude.

It is suggested from the results that the associations between dispositional indebtedness and feeling owing others is more reliable and stronger than the associations between dispositional gratitude and feeling thankful. Feeling thankful seems to be more situational dependent. The results might reflect a notion that “bad is stronger than good” (Baumeister et al., 2001). Indebtedness disposition appears to have a stronger threshold-setting effect for corresponding emotions than does gratitude disposition.

In line with the specificity in trait-emotion relationship proposed by Rosenberg (1998), the results showed that consistently for the four situations, there was no correlation found between gratitude disposition and feeling owing others, and between indebtedness disposition and feeling thankful. It suggests that disposition of gratitude predispose young people to feel thankful but not to feel owing others which might be a trait-incongruent emotion. Likewise, dispositional indebtedness makes young people more easily to feel owing others but not necessarily to feel thankful. The specificity in threshold-setting effect further indicates the distinctness between gratitude and indebtedness.

Trait and emotion effect on prosocial motivation and on reciprocation

Including both dispositional and emotional gratitude and indebtedness as predictors for prosocial motivation yielded some interesting results that have not been found in the literature. One of the most important results seems to be that gratitude disposition was consistently found to be a significant and particularly strong predictor for prosocial

motivation almost under all conditions of the four situations, suggesting that after receiving other's favor in various situations, more grateful students are generally more willingly and readily to engage in prosocial behaviors in the future and when given a chance for repayment. Indebtedness disposition, however, was found to have no significant associations with prosocial motivation. The findings corroborate the results of Study 1 in which gratitude and indebtedness were demonstrated to have differential associations with helping tendencies. The differential associations seem to function not only in general tendencies to initiate and enjoy helping but also in specific social situations. In addition, dispositional gratitude seems to have a much stronger associations with prosocial motivation than with the emotional response of feeling thankful, suggesting that grateful students are generally primed to be highly motivated to provide help or respond upon others' needs although they might not respond with feeling thankful in certain situations such as when being expected to repay.

Under the conditions of with- and without-expectation-to-repay in gift and helping situations, students' feeling thankful was also found to be a strong predictor in addition to dispositional gratitude for prosocial motivation. Under request condition of the two situations involving costs, students' feeling obliged to repay was found to be a significant predictor for prosocial motivation in addition to feeling thankful and dispositional gratitude. Particularly worth mentioning is that under all the ambiguous conditions except in low-cost situation, dispositional gratitude was found to be the only significant predictor for prosocial motivation. This finding indicates that when information of benefactor expectation or help initiation is not clear, young adolescents tend to rely more

on their gratitude disposition for future prosocial intentions. The higher their dispositional gratitude, the more willingly they would engage in prosocial behaviors in the future.

Compared with predicting prosocial motivation, traits and emotions of gratitude and indebtedness were generally found to be substantially weaker predictors in predicting the magnitude of reciprocation, either having low significance level or not contributing to the prediction under certain conditions. The relatively weak prediction results seem to reflect the reality that reciprocation is a complicated social phenomenon, which might be influenced by many other factors in addition to gratitude and indebtedness traits and emotions. One possible explanation might be that to measure the magnitude of reciprocation, young adolescents were asked to choose one answer among five choices with different proportions of money or time distributable between their own purposes and for the repayment to the benefactor. This measure might be too restricted in range or does not allow for enough variation in how much one would reciprocate.

7.2 Associations

Associations between the two dispositions

There was a slight association found between the dispositional gratitude and indebtedness, suggesting that the two constructs are perceived to be relatively related. This is different from the result of Mathews and Green (2009), in which they found a significant negative correlation between gratitude and indebtedness trait ($r = -.36, p < .001$). The possible reason for this difference may be due to the different measures they adopted. They followed Greenberg's definition and defined indebtedness as the obligation to repay and used the Indebtedness Scale (Greenberg, 1980; Watkins, Elster, Maleki, & McLeod, 2005) to measure dispositional indebtedness. An example of the

Indebtedness Scale is “One should return favors from a friend as quickly as possible in order to preserve the friendship”. In the present study, indebtedness was defined as an emotional inclination to feel owing others rather than a behavioral or motivational tendency to get the repayment fulfilled. Indebtedness disposition, as a tendency to feel owing others more intensively, more frequently, in more social situations and toward more people, does not necessarily suggest a quick-repayment pattern but may possibly imply at least the awareness of having received other’s benefits. In addition, grateful people may understand better than those who concern solely on repayment itself that repaying too soon is inappropriate for building up relationships because it may be understood as repaying for “square” thus offending the benefactor. These reasons somewhat serve to explain the opposite correlations Mathews and Green (2009) found.

Associations between gratitude and obligation to repay

In Study 1, the item that included “obligated to repay” in GIQ-12 was found to load on the latent factor of gratitude instead of indebtedness, indicating that obligation to repay appeared to link more closely to gratitude. The result suggested that obligation for repayment might be understood as an integrated component in the experience of gratitude by Chinese young adolescents, as a result of the influence of *Bao-En* in Chinese culture. It seems that the more grateful the young adolescents were, the more obligated they felt they should repay as they grow up. This may also suggest cultural differences concerning the feeling of obligation. Chinese culture characterized by its collectivism thoughts, may lead young people to have a tendency to feel more positive toward obligation to repay than westerners.

In addition, similar patterns of associations between gratitude and obligation are also observed in the results of the experiments, in which feeling thankful and feeling obliged to repay have similar patterns of affective associations in helping situation.

The results of trait-emotion relationship also show that both dispositional traits of gratitude and indebtedness were found to have some associations with the feeling of obliged to repay, suggesting that similar to the interaction between dispositional indebtedness and feeling obliged to repay, more dispositional grateful students are also more likely to feel obliged to repay.

These associations raise more questions regarding the relation between gratitude and indebtedness: What do the associations between gratitude and indebtedness defined as “obligation to repay” imply for the conceptualization of gratitude and indebtedness? How to take further steps to make generalizable conclusions regarding the association between gratitude and obligation? Further investigations are warranted for answering these questions.

Help initiation

Students reported significantly higher on feeling thankful than feeling obliged to repay, and the lowest level of feeling owing others regardless of the conditions of help initiation. However, their responses of feeling thankful, owing others, and obliged to repay did not vary significantly as a function of different conditions of help initiation in both high- and low-cost situations. One possible reason is that the students are relatively young and not sensitive to the locus of help initiation, or to the responsibility of causing problems or costs to others. However, more plausible is that costs for the benefactor might be weighed to similar degrees by the beneficiary for responding feeling thankful,

owing others, and obliged to repay regardless of the locus of help initiation or who is responsible for initiating the helping. After all, the problems described in the situation have already occurred in the process of providing help. Even if the costs are on the benefactor's side and caused by him or herself, the beneficiary might still feel a similar level of owing others as in the situation where the beneficiary is the "problem-maker". This line of thought is supported by the common factor of "*Bu-Hao-Yi-Si*", which was found to consistently and positively relate to the three emotional states across two situations, with increasing magnitude of association from feeling thankful, feeling obliged to repay, to feeling owing others. *Bu-Hao-Yi-Si* is a special Chinese concept which connotate the meaning of social embarrassment, sorry for causing troubles or not being able to help, losing face, or feeling ashamed. Feeling *Bu-Hao-Yi-Si* for causing problems or costs might lead young people to enjoy less in feeling thankful and bring more similarity or less discrepancy for the three feelings.

7.3 Contributions and Implications of the Study

Findings of the present study have important theoretical and pragmatic implications in the psychology of gratitude and moral education, and particularly shed lights on understanding the key issue of the relation between gratitude and indebtedness among Chinese youth.

Theoretical implications

a) Gratitude and indebtedness

In both studies, the results showed that gratitude and indebtedness defined as "owing others", although in some way associated, can be dissociated not only at dispositional level but also at situational level. Psychologists suggest the dual nature of gratitude,

indicating that “the concept of gratitude involves both positive feelings and feelings of indebtedness” (Naito et al., 2005, p.249). Ross Buck (2004) distinguished a gratitude of exchange and a gratitude of caring. Exchange involves issues of equity and is related to Kohlberg’s (1964) “morality of justice” whereas caring involves love and bonding and is related to Gilligan’s (1982) “morality of caring.” This is also one way of recognizing the dual nature of gratitude.

Nonetheless, the findings of the present study have important implications for the nature of gratitude. The positivity of gratitude was consistently supported across situations among the Chinese young adolescents. In addition, the more a benefactor made the norm of reciprocity salient, the less thankful the beneficiary felt, and the less motivated the beneficiary felt to do according to the norm. The results suggest that gratitude is not an emotion of exchange, but an emotion of love and caring. Very plausibly, when returning a favor motivated by gratitude, the beneficiary does not consider their behavior as some kind of exchange for the received favors. Therefore, if returning to the philosophical thoughts of gratitude that was introduced in previous section, the results of the present study indicate that it is better to understand gratitude as a virtue involving positive regard and caring, rather than as an obligation and it is better to treat gratitude and indebtedness separately. Buck also pointed out the risk of reducing gratitude to “mere economies of exchange” (p. 11, Emmons, 2004) when viewing gratitude as having dual nature. The proposition of dual nature of gratitude might be due to the association between gratitude and indebtedness and the long history of oversight of the differences between them.

The results of the differential associations of gratitude and indebtedness with subjective well-being and helping tendencies provided further evidence for the construct validity of gratitude and indebtedness defined as “owing others”. They also have important implications for human flourishing, especially when taking the young age of our samples into consideration. Human flourishing is defined as “live within an optimal range of human functioning, one that connotes goodness, generativity, growth, and resilience” (Fredrickson & Losada, 2005). As young as upper elementary to lower secondary stage, grateful students enjoyed heightened life satisfaction, felt happier and more positive, and were more resilient by buffering against negative emotions than their less grateful counterparts. However, students’ indebtedness disposition predicted low life satisfaction, and strongly predicted more negative emotional experiences. The results suggested that even for young adolescents, the proneness to feel thankful versus feel owing others has different impact toward their personal well-being. Although indebtedness is assumed to be understood later than gratitude, it can exert somewhat opposite influence which might diminish the positive effects of gratitude. The results suggest the importance of further understanding the individual differences on dispositional gratitude as well as dispositional indebtedness.

● The findings of differential associations with helping tendencies also have implications for the development of interpersonal relationship and prosociality. Grateful students were found to more frequently go out of their ways to offer help whereas indebted ones withhold and are more cautious in initiating to offer help. Taking initiation to help is essential in altruistic behaviors and formation of interpersonal relationship. Students who have higher helping tendencies toward others are more likely to be

perceived as warm and resourceful, thus they might more easily build rapport among peers. For children who are approaching their teenage years, establishing relationship and developing friendship are essential life themes, therefore taking more initiative to help is important in terms of its facilitating effect of formation and maintaining healthy interpersonal relationships and exchange patterns. The relationships based on mutual respect and regard make students thrive. In addition, early adolescence is a particularly important age period to prosocial development because many young people are presented with more opportunities for engaging in prosocial behaviors. For example, many children become engaged in voluntary activities such as service learning in school setting or charity organizations when growing up to adolescence. Given the opportunities of prosocial development, grateful children take more initiative to involve in the voluntary activities than indebted ones and grow up to be more active members making more contributions to their communities.

b) Gratitude and obligation to repay

Gratitude and indebtedness defined as “obligation to repay” were found to be associated with each other in some ways. As stated above, the item “Feeling more obligated to repay as growing older” unexpectedly loaded on the factor of “Gratitude” in Study 1, suggesting that obligation to repay might be more closely associated with gratitude than assumed and it may be perceived as an integrated component of gratitude for Chinese young people. The association between gratitude and obligation to repay was also found in Study 2. In the hypothetical helping situation, the respective correlational patterns of “feeling thankful” and “feeling obliged” with emotional responses are highly similar. These results lend support to the similarity or overlapping of these two constructs.

In addition, In Study 2a and 2b, the constructs of “feeling thankful”, “feeling owing others”, and “feeling obliged to repay” were respectively related to various emotional responses with different patterns in different hypothetical situations, indicating that to some degree the constructs of gratitude and indebtedness are more complex than as originally assumed.

These empirical findings suggest that more rethinking about the relation between gratitude and indebtedness at a deeper level is needed. One question is: Can “obligation to repay” be considered an element of “gratitude” instead of “indebtedness” in the Chinese young adolescents? This question suggests that Chinese culture should be involved in the conceptualization of gratitude and indebtedness. I think Chinese culture influences people’s experiences of gratitude and indebtedness in at least two ways. On the one hand, one may be more vulnerable to develop a disposition of “feeling owing others” because of the overemphasis of *Bao-En*. On the other hand, one may perceive “obligation to repay” as a positive thing because repaying the benefits received is just an integrated part of gratitude that is worth encouraging.

c) Two forms of indebtedness

Indebtedness could be complex, as evidenced by the emergence of a third component defined by an obligation to repay in addition to the thinking of feeling of owing others parallel to the feeling of thankfulness at the dispositional level in Study 1. The findings from Study 2 also suggest that it is important to clarify different forms of indebtedness. Feeling owing others and feeling obliged to repay appeared to show somewhat different patterns in the study, a result also found in past research (Watkins et al., 2006; Greenberg & Frisch, 1972). The emotional state of feeling owing others was found to have more

negative affective associations than obligation of repayment. In addition, students reported higher level of feeling obliged to repay than feeling owing others. Feeling owing others and feeling obliged to repay also appeared to separately predict how much one would reciprocate in different situations. The results imply that although feeling owing others and obliged to repay are generally correlated, they may be independent from each other.

Further delineation on indebtedness could be interesting and desirable. In the literature, the psychological construct indebtedness defined as “obligation to repay” received much more research attention than indebtedness defined as “owing others”. Suggested by the findings of differentiation between gratitude and indebtedness defined as “owing others”, more empirical studies should be conducted to replicate the results. The findings of this study are based on defining indebtedness as “owing others” at the dispositional level and as both “owing others” and “obligation to repay” at situational level. At dispositional level, some developments along the line of extension of the instrument of GIQ-12 might be necessary in the future.

Concerning the findings of the relation between gratitude and indebtedness on the dispositional and situational levels, as well as their consequences on psychological functioning, I think that individual differences in developmental stages would play an important role. It is possible that young adolescents’ understanding of gratitude which includes obligation to repay is less well developed than adults. It is also possible that their perception of owing others is not the same as that of more matured students or adults. Admittedly, the developmental influences were not specifically considered in this study given the limited range of ages among the participants.

It should also be noted that the original studies were conducted in Chinese and the results are written and discussed based on the English translated version of the questionnaires. There might be subtle discrepancies between the original questionnaires and their translations. Particularly, “feeling obliged to repay” may not be equivalent to “*You-Bi-Yao Hui-Bao*” (有必要回報) in Chinese. The Chinese “*Hui-Bao*” generally sounds more positive than the English “repayment”. Future studies should attend more fully to this and other translation issues, particularly those issues related to the Chinese culture.

Empirical implications

The findings have good implications for moral education and designing gratitude interventions for children and adolescents. The main findings of differential associations between gratitude and indebtedness defined as “owing others” indicated that different dispositional traits of gratitude and indebtedness have different associations with young people’s growth, in terms of personal well-being and social well-being. This has significant implications for moral education, especially in Chinese cultural context. Since Chinese culture of *Bao-En* is so permeated that we are often unconsciously influenced by indebtedness, either being unaware or tend to downplay the negative impact of indebtedness. Moral educators, be they teachers, parents, or other significant adults, should be encouraged to educate children to not only embrace gratitude, but also understand indebtedness. It would be beneficial to teach children to fully appreciate the positive concerns from benefactors and be aware of the possible “pitfall” of feeling owing others. In addition, it is of great importance to teach them to enjoy the giving and

receiving process and to repay in accordance to the needs of benefactors or the third party rather than simply emphasizing repayment per se.

The results of the interaction between gratitude and indebtedness at emotion levels have interesting implications in our daily situations. Feeling thankful was found to be less pleasant in the situations involving salient costs for the benefactor. We can try to express our caring and concern through providing a certain benefit and making our cost less salient to the beneficiary to make them feel more positive or enjoy more for our benefit. This explained why it is often a good reply for “thanks”: “Don’t mention it. I just do it by the way.”

Gratitude’s association with youth’s well-being suggests that promoting gratitude may be a useful intervention for educators and mental health practitioners working with children and adolescents. Evidence has shown that gratitude interventions such as “counting blessings” (Emmons & McCullough, 2003), “benefit finding” (Affleck & Tennen, 1996), and “gratitude visit” (Seligman et al., 2005) demonstrated some positive impact on adults’ short-term and long-term enhancement of happiness. Educational programs and interventions that promote gratitude in young people should be a worthwhile investment in the future.

However, the coincidence of feeling thankful, owing others, and obliged to repay upon receiving some benefit suggests the necessity for a careful design of gratitude interventions. We should be alert of the possibility of confounding the effects of gratitude with the influence of indebtedness. For instance, Chan (2010) found that the effects of an eight-week Naikan-like gratitude intervention were evident only for low-gratitude group of teachers who scored low on gratitude disposition measured by GQ-6, not for high-

gratitude group. He offered one explanation that the self-reflection questions might also induced heightened feelings of indebtedness as well as gratitude (Chan, 2010). Admittedly, the possible elicitation of the feelings of owing others together with the feelings of gratitude in interventions needs further investigations. The findings of the present study at least suggest the necessity to further understand the dynamics of gratitude and indebtedness in social situations and interventions.

7.4 Conclusions: Limitations and Future Directions

To further understand gratitude and indebtedness, the present study extended past findings to the Chinese setting and examined the relationships between gratitude and indebtedness at both dispositional and situational levels among Chinese young adolescents in Hong Kong. The present study has made some significant contributions to the existent literature. In conclusion, the study yielded important results that extended prior understandings of (a) the nature of gratitude and indebtedness defined as “owing others” as two separate affective traits and their differential associations with subjective well-being and helping tendencies; (b) the situational and conditional factors that can differentiate feelings of gratitude and indebtedness; (c) the trait-emotion relationship and the influence of traits and emotions of gratitude and indebtedness on prosocial motivation and the magnitude of reciprocation. In general, the findings of the present study provide food for thoughts for (re-)conceptualizing the meanings of “gratitude” and “indebtedness” and for understanding the relationship between the two psychological constructs.

Despite the useful findings and contributions, this study is an initial and exploratory attempt with many limitations that should be noted. In addition, further research should

be conducted to advance the research in the field of gratitude for a deeper understanding of both gratitude and indebtedness and the interaction between the two.

One obvious and major limitation is that the present study restricted the study sample to Chinese young adolescents in Hong Kong. Thus generalization of the findings to Chinese older populations and in other social contexts should be made with caution. Admittedly, this study only sampled the population of above-average ability students, the findings may not be generalized to other populations with low or average abilities.

A major methodological limitation of the present study is the reliance on students' responses to vignettes instead of manipulations in laboratory setting for the assessment of emotional states upon receiving a favor. Future studies using actual benefit given to participants will extend the present findings. Especially for the different conditions of help initiation, using confederate or other methods of manipulation to differentiate solicited or unsolicited help might have stronger impact than vignettes and might yield different results. However, using vignettes is not only feasible but also enabling careful control which cannot be easily achieved with laboratory manipulations, especially in consideration of manipulating the perceived expectation to return of the benefactor.

Another methodological limitation in the two experiments is the possibility of a ceiling effect for students' responses of feeling thankful. Other research on gratitude has also found ceiling effect with self-reported gratitude (Watkins, et al., 2006; Tsang, 2007). Future research may wish to consider improved assessment scales or alternative methods.

In addition, the present study focused on the possible differentiation between gratitude and indebtedness through the measure of GIQ-12 which did not fully take into account the complexity of the construct of indebtedness. Future work may focus on

revising and refining GIQ-12 with more items on obligation to repay to further clarify the association between gratitude and obligation to repay. The findings also suggest questions on the intricate interaction between gratitude and indebtedness to be addressed in future studies: Is obligation an integrate part of gratitude? Is the association between gratitude and obligation to repay a cultural specific phenomenon or in a sense more universal? How does *Bao-en* related to obligation to repay in Chinese culture?

At the level of emotional states, the present study attempted to disassociate gratitude and indebtedness through several factors such as different expectations to return, help initiations, and the effect of reciprocation. Nonetheless, there are other factors that might be potentially contributable to further differentiation. Schuamberg and Flynn (2009) formulated a series of testable propositions for differentiating gratitude and indebtedness which suggested a fruitful research orientation for future works. For instance, different size and type of reciprocation might be the outcome of different emotional experiences of gratitude and indebtedness (Schaumberg & Flynn, 2009). Further research of different effects of gratitude and indebtedness on the magnitude as well as the types of reciprocation will extend the findings of present study. Moreover, how gratitude and indebtedness interact with each other in social situations remains ambiguous and warrant further explorations. Situations that can elicit more feelings of indebtedness than feelings of gratitude should be identified in future studies. And both situational and dispositional factors that typically elicit both heightened feelings of gratitude and indebtedness might also be investigated.

Given the results of meaningful differentiation between dispositional gratitude and indebtedness defined as “owing others”, it is worthy of making some efforts to go further

along the research framework of identifying the unique characteristics and developmental trajectories of each construct. Considering from the perspective of development, much more should be learnt about the psychology of gratitude in children and adolescents. For instance, what role does socialization play in the development of gratitude and indebtedness? What factors (e.g., socioeconomic status, attachment and parenting styles, or educational and cultural influence) contribute to the development of gratitude and indebtedness? The collection of qualitative data through case studies and interviews and longitudinal studies could be helpful to understand the on-going developmental process of gratitude as well as indebtedness among young people and to identify what factors are more important on the development of gratitude and indebtedness at different stages.

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Appendices

Appendix A Gratitude and Indebtedness Questionnaire -12 (Chinese translated version)

以下題目是希望知道你通常對生活的感受。請仔細閱讀每條題目，並根據自己的情況，選擇一個最符合你情況的數字答案（由①極少符合，程度按序遞增至⑤非常符合），並將該數字答案填滿。

我通常對生活的感受：	極少符合	有點符合	一般符合	大部分符合	非常符合
1. 我的生活中有很多令我感謝的事。	①	②	③	④	⑤
2. 當我看我生活中的人和事，我看不到多少讓我感到虧欠的。	①	②	③	④	⑤
3. 事情過了很久我才能體會到我欠了別人的情應該償還。	①	②	③	④	⑤
4. 如果要列出所有我覺得感恩的事，該清單會很長。	①	②	③	④	⑤
5. 當我不斷成長，我越感到自己必須償還生活中為我付出的人。	①	②	③	④	⑤
6. 當我看這個世界時，我看不到多少值得感恩的東西。	①	②	③	④	⑤
7. 如果把我覺得虧欠別人的事都寫下來，會有很多要寫的。	①	②	③	④	⑤
8. 我感激各種各樣的人。	①	②	③	④	⑤
9. 年紀越長，我覺得自己更懂得感激在我生活中出現的人、事及境況。	①	②	③	④	⑤
10. 要經過很長時間才能讓我對某件事或某個人感到謝意。	①	②	③	④	⑤
11. 我對各種不同的人感到虧欠。	①	②	③	④	⑤
12. 我的生活中有很多令我感到虧欠的事。	①	②	③	④	⑤

Appendix B Satisfaction with Life Scale (Chinese translated version)

以下題目是希望知道你通常對生活的感受。請仔細閱讀每條題目，並根據自己的情況，選擇一個最符合你情況的數字答案（由①極少符合，程度按序遞增至⑤非常符合），並將該數字答案填滿。

	極少符合	有點符合	一般符合	大部分符合	非常符合
<hr/>					
我通常對生活的感受、看法和我的生活狀態：					
1. 在很多方面，我的生活接近理想狀態。	①	②	③	④	⑤
2. 我對我的生活滿意。	①	②	③	④	⑤
3. 到目前為止，我得到了生活中我想要的重要的東西。	①	②	③	④	⑤
4. 如果可以重新來過，我幾乎沒有什麼想改變的。	①	②	③	④	⑤
5. 我的生活條件非常好。	①	②	③	④	⑤
<hr/>					

Appendix C Positive and Negative Affect Schedule (Chinese translated version)

下列詞語描述不同的感受和情感。請仔細閱讀每個詞語，然後選擇一個可以最好地描述你平時的一般感受（也就是一般來講，你平時感覺如此）的數字答案（由①極少符合，程度按序遞增至⑤非常符合），並將該數字答案填滿。

一般來講，我平時感覺：		完全沒有感覺到	有點感覺到	中等程度地感覺到	強烈地感覺到	非常強烈地感覺到
1.	活躍	①	②	③	④	⑤
2.	害怕	①	②	③	④	⑤
3.	機警	①	②	③	④	⑤
4.	羞愧	①	②	③	④	⑤
5.	專注	①	②	③	④	⑤
6.	堅決	①	②	③	④	⑤
7.	悲傷	①	②	③	④	⑤
8.	熱心	①	②	③	④	⑤
9.	興奮	①	②	③	④	⑤
10.	內疚	①	②	③	④	⑤
11.	不友善	①	②	③	④	⑤
12.	有靈感	①	②	③	④	⑤
13.	對事物感興趣	①	②	③	④	⑤
14.	易怒	①	②	③	④	⑤
15.	反應過敏	①	②	③	④	⑤
16.	緊張	①	②	③	④	⑤
17.	自豪	①	②	③	④	⑤
18.	恐懼	①	②	③	④	⑤
19.	堅強	①	②	③	④	⑤
20.	煩惱	①	②	③	④	⑤

Appendix D Helping Tendencies Check List (Chinese translated version)

請仔細閱讀每條題目，並根據自己的情況，選擇一個最符合你情況的數字答案（由①極少符合，程度按序遞增至⑤非常符合），並將該數字答案填滿。

	極少符合	有點符合	一般符合	大部分符合	非常符合
1. 我喜歡幫助有需要的人。	①	②	③	④	⑤
2. 我尋找機會去幫助別人。	①	②	③	④	⑤
3. 我時常自告奮勇去幫助別人。	①	②	③	④	⑤
4. 我極少主動幫助他人。	①	②	③	④	⑤
5. 我經常盡力令不快樂的人開心一點。	①	②	③	④	⑤

Appendix E Tables of results for exploratory factor analysis of SWL, PANAS, and Helping Tendencies Checklist

Table 1. Summary of Varimax-Rotated One -Factor Solution for SWL ($N = 381$)

	Factor
Satisfaction with life	1
Feeling satisfied with life (3)	75
Having gotten important things in life (6)	62
Life conditions are excellent (10)	70
Would change nothing if living life over (15)	41
Life is close to ideal (22)	66

Note: Decimals are omitted in presenting the factor loading. Only the salient loadings of magnitude .30 or above are shown. Item numbers are in parentheses.

Table 2. Summary of Varimax-Rotated Two-Factor Solution for PANAS ($N = 381$)

Positive and negative affects	Factor	
	1	2
Active	-	62
Alert	-	44
Attentive	-	44
Determined	-	60
Enthusiastic	-	65
Excited	-	63
Inspired	-	57
Interested	-	62
Proud	-	45
Strong	-	65
Afraid	73	-
Ashamed	56	-
Distressed	62	-
Guilty	60	-
Hostile	48	-
Irritable	46	-
Jittery	44	-
Nervous	61	-
Scared	82	-
Upset	60	-

Note: Decimals are omitted in presenting the factor loading. Only the salient loadings of magnitude .30 or above are shown. Items are arranged to display the clear factor structure.

Table 3. Summary of Varimax-Rotated One-Factor Solutions for Helping Tendencies

Checklist ($N = 381$)

Helping tendencies	Factor
	1
Enjoy in helping others	78
Go out one's way to help	78
Volunteer to offer assistance	77
Rarely take the initiative to help	64
Try one's best to cheer up others	59

Note: Decimals are omitted in presenting the factor loading.

Appendix F Vignettes for No-expectation Condition in Study 2a

以下題目是想了解你在特定情況下的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量把自己放在所描述的情境當中，根據你在那樣的情境之下會產生的感覺和想法，來回答以下問題。

情境一

你和樂樂是在參加課外活動時認識的。除了課外活動時經常在一起，你們有兩三次一起吃東西，聊得很開心。你知道樂樂喜歡收集飛機模型，而樂樂也知道你喜歡各式各樣的機械人模型。你生日的時候，意外地收到樂樂給你的生日禮物，打開一看是一個造型獨特的機械人模型。你說還不知道樂樂的生日，樂樂說：「今天是你的大日子，你喜歡這個禮物，我真的好開心。」

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
聽了樂樂的話，你知道樂樂真心不求回報，此時你覺得：					
1. 開心	①	②	③	④	⑤
2. 反感	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回禮	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 喜出望外	①	②	③	④	⑤

11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤
接受了樂樂的禮物，你覺得：					
13. 樂意以後多關心樂樂	①	②	③	④	⑤
14. 樂意以後多關心其他人	①	②	③	④	⑤

後來，一個偶然的機會你得知樂樂的生日就在下個月。一次逛街買東西的時候，你無意中看到各種造型的模型飛機。不過，你原本打算買你最喜歡的東西。

在這種情況下，你覺得：

15. 我覺得樂意花一些錢為樂樂買一架模型飛機

① ② ③ ④ ⑤

對於要為樂樂購買模型飛機，你會怎麼做？

16. 根據手上現有的錢，我會：

- ① 花很小部分為樂樂買禮物
- ② 花小部分為樂樂買禮物
- ③ 花一半為樂樂買禮物，另一半為自己買東西
- ④ 花大部分為樂樂買禮物
- ⑤ 全部用來為樂樂買禮物

你花了一些時間，為樂樂挑選了一架模型飛機。後來你把禮物送給樂樂。

你已經回贈了樂樂禮物。此時，想到樂樂，你覺得：

17. 我覺得感謝樂樂

① ② ③ ④ ⑤

18. 我覺得欠了樂樂的情

① ② ③ ④ ⑤

情境二

考試前的某一天，你因為生病請假在家休息。你知道那天的課很重要，老師會總結全期課程。放學後，豆豆打電話給你，然後來你家看你，並帶給你老師當天發的複習資料和自己做的詳細筆記。當你跟好友說到豆豆幫你的這件事，好友說豆豆是樂於助人而不求回報的那種人。

得知豆豆是不求回報的，此時你覺得：

1. 開心

① ② ③ ④ ⑤

2. 反感

① ② ③ ④ ⑤

3. 感謝

① ② ③ ④ ⑤

4. 被關愛

① ② ③ ④ ⑤

5. 不安

① ② ③ ④ ⑤

6. 欠了豆豆的情

① ② ③ ④ ⑤

7. 無奈

① ② ③ ④ ⑤

8. 有必要回報豆豆

① ② ③ ④ ⑤

- | | | | | | | |
|-------|-----------|---|---|---|---|---|
| 9 | 自己是很有價值的人 | ① | ② | ③ | ④ | ⑤ |
| 10. | 喜出望外 | ① | ② | ③ | ④ | ⑤ |
| ----- | | | | | | |
| 11 | 內疚 | ① | ② | ③ | ④ | ⑤ |
| 12. | 輕鬆 | ① | ② | ③ | ④ | ⑤ |

得到了豆豆的幫助，你覺得：

- | | | | | | | |
|-----|-------------------|---|---|---|---|---|
| 13 | 樂意以後多幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 14. | 樂意以後多幫助其他人 | ① | ② | ③ | ④ | ⑤ |

後來，豆豆好幾天沒來上學。有一次小息的時候，豆豆說她（他）數學有些跟不上，問你可不可以放學後給她（他）講幾道數學題。不過，你本來想放學後去圖書館看一本令你著迷的書。

在這種情況下，你覺得：

- | | | | | | | |
|-----|------------------------|---|---|---|---|---|
| 15. | 我覺得樂意花一些時間幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
|-----|------------------------|---|---|---|---|---|

對於要幫助豆豆，你會怎麼做？

16. 在回家之前的時間裏，我會：
- ① 用很小部分幫助豆豆
 - ② 用小部分幫助豆豆
 - ③ 用一半幫助豆豆，另一半去圖書館看書
 - ④ 用大部分幫助豆豆
 - ⑤ 用全部時間來幫助豆豆

經過一些時間，你給豆豆講解完了她（他）想問的全部數學題。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

- | | | | | | | |
|-----|--------------------|---|---|---|---|---|
| 17. | 我覺得感謝 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 18. | 我覺得欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |

Appendix G Vignettes for Expectation Condition in Study 2a

以下題目是想了解你在**特定情況下**的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量**把自己放在所描述的情境當中**，根據你在那樣的情境之下會產生的**感覺和想法**，來回答以下問題。

情境一

你和樂樂是在參加課外活動時認識的。除了課外活動時經常在一起，你們有兩三次一起吃東西，聊得很開心。你知道樂樂喜歡收集飛機模型，而樂樂也知道你喜歡各式各樣的機械人模型。你生日的時候，意外地收到樂樂給你的生日禮物，打開一看是一個造型獨特的機械人模型。你說還不知道樂樂的生日，樂樂說：「我的生日是下個月12日，別忘了哦，你知道我最喜歡飛機模型。」

聽了樂樂的話，你知道樂樂明顯期望你回報，此時你覺得：

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
1. 開心	①	②	③	④	⑤
2. 反感	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回禮	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 喜出望外	①	②	③	④	⑤

11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤

接受了樂樂的禮物，你覺得：

13. 樂意以後多關心樂樂	①	②	③	④	⑤
14. 樂意以後多關心其他人	①	②	③	④	⑤

一個月快要過去了。一次逛街買東西的時候，你無意中看到各種造型的模型飛機。不過，你原本打算買你最喜歡的東西。

在這種情況下，你覺得：

15. 我覺得樂意花一些錢為樂樂買一架模型飛機 ① ② ③ ④ ⑤

對於要為樂樂購買模型飛機，你會怎麼做？

16. 根據手上現有的錢，我會：
- ① 花很小部分為樂樂買禮物
 - ② 花小部分為樂樂買禮物
 - ③ 花一半為樂樂買禮物，另一半為自己買東西
 - ④ 花大部分為樂樂買禮物
 - ⑤ 全部用來為樂樂買禮物

你花了一些時間，為樂樂挑選了一架模型飛機。後來你把禮物送給樂樂。

你已經回贈了樂樂禮物。此時，想到樂樂，你覺得：

17. 我覺得感謝樂樂 ① ② ③ ④ ⑤
18. 我覺得欠了樂樂的情 ① ② ③ ④ ⑤

情境二

考試前的某一天，你因為生病請假在家休息。你知道那天的課很重要，老師會總結全期課程。放學後，豆豆打電話給你，然後來你家看你，並帶給你老師當天發的複習資料和自己做的詳細筆記。當你跟好友說到豆豆幫你的這件事，好友說豆豆給人幫忙會要求回報，跟豆豆交往過的都知道豆豆是不會白白幫助別人的。

你知道豆豆明顯期望你回報，此時你覺得：

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
1. 開心	①	②	③	④	⑤
2. 反感	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了 <u>豆豆</u> 的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回報 <u>豆豆</u>	①	②	③	④	⑤

- | | | | | | |
|--------------|---|---|---|---|---|
| 9. 自己是很有價值的人 | ① | ② | ③ | ④ | ⑤ |
| 10. 喜出望外 | ① | ② | ③ | ④ | ⑤ |
| ----- | | | | | |
| 11. 內疚 | ① | ② | ③ | ④ | ⑤ |
| 12. 輕鬆 | ① | ② | ③ | ④ | ⑤ |

得到了豆豆的幫助，你覺得：

- | | | | | | |
|-----------------------|---|---|---|---|---|
| 13. 樂意以後多幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 14. 樂意以後多幫助其他人 | ① | ② | ③ | ④ | ⑤ |

後來，豆豆好幾天沒上學。有一次小息的時候，豆豆說她（他）數學有些跟不上，問你可不可以放學後給她（他）講幾道數學題。不過，你本來想放學後去圖書館看一本令你著迷的書。

在這種情況下，你覺得：

- | | | | | | |
|----------------------------|---|---|---|---|---|
| 15. 我覺得樂意花一些時間幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
|----------------------------|---|---|---|---|---|

對於要幫助豆豆，你會怎麼做？

16. 在回家之前的時間裏，我會：
- ① 用很小部分幫助豆豆
 - ② 用小部分幫助豆豆
 - ③ 用一半幫助豆豆，另一半去圖書館看書
 - ④ 用大部分幫助豆豆
 - ⑤ 用全部時間來幫助豆豆

經過一些時間，你給豆豆講解完了她（他）想問的全部數學題。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

- | | | | | | |
|------------------------|---|---|---|---|---|
| 17. 我覺得感謝 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 18. 我覺得欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |

Appendix H Vignettes for Ambiguous Condition in Study 2a

以下題目是想了解你在**特定情況**下的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量把自己放在所描述的情境當中，根據你在那樣的情境之下會產生的**感覺和想法**，來回答以下問題。

情境一

你和樂樂是在參加課外活動時認識的。除了課外活動時經常在一起，你們有兩三次一起吃東西，聊得很開心。你知道樂樂喜歡收集飛機模型，而樂樂也知道你喜歡各式各樣的機械人模型。你生日的時候，意外地收到樂樂給你的生日禮物，打開一看是一個造型獨特的機械人模型。你說還不知道樂樂的生日，樂樂笑而不答。

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
不清楚樂樂是否期望你回報，對於樂樂送禮物給你，你覺得：					
1. 開心	①	②	③	④	⑤
2. 反感	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回禮	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 喜出望外	①	②	③	④	⑤
11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤
接受了樂樂的禮物，你覺得：					
13. 樂意以後多關心樂樂	①	②	③	④	⑤
14. 樂意以後多關心其他人	①	②	③	④	⑤

A) 你是否傾向於覺得樂樂期望回報，或不期望回報呢？

我傾向於覺得：

- ① 樂樂不期望我回報
- ② 沒有明確的想法
- ③ 樂樂期望我回報

後來，一個偶然的機會你得知樂樂的生日就在下個月。一次逛街買東西的時候，你無意中看到各種造型的模型飛機。不過，你原本打算買你最喜歡的東西。

在這種情況下，你覺得：

15. 我覺得樂樂花一些錢為樂樂買一架模型飛機 ① ② ③ ④ ⑤

對於要為樂樂購買模型飛機，你會怎麼做？

16. 根據手上現有的錢，我會：
- ① 花很小部分為樂樂買禮物
 - ② 花小部分為樂樂買禮物
 - ③ 花一半為樂樂買禮物，另一半為自己買東西
 - ④ 花大部分為樂樂買禮物
 - ⑤ 全部用來為樂樂買禮物

你花了一些時間，為樂樂挑選了一架模型飛機。後來你把禮物送給樂樂。

你已經回贈了樂樂禮物。此時，想到樂樂，你覺得：

17. 我覺得感謝樂樂 ① ② ③ ④ ⑤
18. 我覺得欠了樂樂的情 ① ② ③ ④ ⑤

情境二

考試前一週的某一天，你因為生病不得不請假在家休息。你知道那天的課很重要，老師會總結全期課程。放學後，豆豆打電話給你，然後來到你家看你，並帶給你老師當天發的複習資料和自己做的詳細筆記。當你跟好友說到豆豆幫你的這件事，好友說，不清楚豆豆是不是那種幫助別人卻不求回報的人。

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
不清楚 <u>豆豆</u> 是否期望你回報，對於 <u>豆豆</u> 的幫助，你覺得：					
1. 開心	①	②	③	④	⑤
2. 反感	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤
6. 欠了 <u>豆豆</u> 的情	①	②	③	④	⑤

- | | | | | | | |
|-------|-----------------|---|---|---|---|---|
| 7 | 無奈 | ① | ② | ③ | ④ | ⑤ |
| 8 | 有必要回報 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 9 | 自己是很有價值的人 | ① | ② | ③ | ④ | ⑤ |
| 10 | 喜出望外 | ① | ② | ③ | ④ | ⑤ |
| ----- | | | | | | |
| 11 | 內疚 | ① | ② | ③ | ④ | ⑤ |
| 12 | 輕鬆 | ① | ② | ③ | ④ | ⑤ |

得到了豆豆的幫助，你覺得：

- | | | | | | | |
|----|-------------------|---|---|---|---|---|
| 13 | 樂意以後多幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 14 | 樂意以後多幫助其他人 | ① | ② | ③ | ④ | ⑤ |

B) 你是否傾向於覺得豆豆期望回報，或不期望回報呢？

我傾向於覺得：

- ① 豆豆不期望我回報
- ② 沒有明確的想法
- ③ 豆豆期望我回報

後來，豆豆好幾天沒上學。有一次小息的時候，豆豆說她（他）數學有些跟不上，問你可不可以放學後給她（他）講幾道數學題。不過，你本來想放學後去圖書館看一本令你著迷的書。

在這種情況下，你覺得：

- | | | | | | | |
|-----|------------------------|---|---|---|---|---|
| 15. | 我覺得樂意花一些時間幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
|-----|------------------------|---|---|---|---|---|

對於要幫助豆豆，你會怎麼做？

16. 在回家之前的時間裏，我會：
- ① 用很小部分幫助豆豆
 - ② 用小部分幫助豆豆
 - ③ 用一半幫助豆豆，另一半去圖書館看書
 - ④ 用大部分幫助豆豆
 - ⑤ 用全部時間來幫助豆豆

經過一些時間，你給豆豆講解完了她（他）想問的全部數學題。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

- | | | | | | | |
|-----|--------------------|---|---|---|---|---|
| 17. | 我覺得感謝 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 18. | 我覺得欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |

Appendix I Vignettes for Request Condition in Study 2b

以下題目是想了解你在**特定情況**下的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量把自己放在**所描述的情境當中**，根據你在那樣的情境之下會產生的**感覺和想法**，來回答以下問題。

情境一

你正在為一個以環保為主題的全校比賽做準備。在圖書館尋找資料的時候，你發現了一本重要的參考書，只是已經被別人借出了。你想起樂樂家有這本書，就去找樂樂，問她（他）借書。樂樂說書被朋友拿去看了，不過她（他）會去朋友家拿回來借給你。樂樂第二天上學時把沉重的上下兩冊書都帶给了你。這兩冊書確實包含很多有用的資料。後來，你在比賽中獲得了優異獎。

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
考慮到樂樂的幫助是出於你的主動要求，你覺得：					
1. 開心	①	②	③	④	⑤
2. 不好意思給樂樂添了麻煩	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回報樂樂	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 幸運	①	②	③	④	⑤

11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤
得到了樂樂的幫助，你覺得：					
13. 樂意以後多幫助樂樂	①	②	③	④	⑤
14. 樂意以後多幫助其他人	①	②	③	④	⑤

過了一段時間，樂樂因為參與一個項目，需要在網上查找很多資料。樂樂問你可不可以當天幫她（他）查找其中一部分資料。當天你也有一些功課要忙。

在這種情況下，你覺得：

15 我覺得樂意花一些時間為樂樂查找資料

① ② ③ ④ ⑤

對於要為樂樂查找資料，你會怎麼做？

16 我會盡可能利用當天時間的：

- ① 很小部分幫助樂樂
- ② 小部分幫助樂樂
- ③ 一半幫樂樂，另一半做自己的事
- ④ 大部分幫助樂樂
- ⑤ 絕大部分幫助樂樂

你花了一些時間找到樂樂需要的資料，並給了她（他）。你得知樂樂已經收到了。

你已經回報了樂樂的幫助。此時，想到樂樂，你覺得：

17 我覺得感謝樂樂

① ② ③ ④ ⑤

18 我覺得欠了樂樂的情

① ② ③ ④ ⑤

情境二

因為數學基礎不太好和請假的原因，你的數學科跟不上進度了。你花了不少力氣補習，仍覺得有些吃力。有一天小息的時候，你去問豆豆可不可以放學後給你講幾道難解的數學題，豆豆答應了。放學後，豆豆耐心地給你講解，解開了你的很多疑問。可是，因為花很多時間給你講題，豆豆錯過了搭校車，只好搭巴士回家。

考慮到豆豆的幫助是出於你的主動要求，你覺得：

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
1. 開心	①	②	③	④	⑤
2. 不好意思給 <u>豆豆</u> 添了麻煩	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤
6. 欠了 <u>豆豆</u> 的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回報 <u>豆豆</u>	①	②	③	④	⑤

- p. 自己是很有價值的人 ① ② ③ ④ ⑤
10. 幸運 ① ② ③ ④ ⑤
-
11. 內疚 ① ② ③ ④ ⑤
12. 輕鬆 ① ② ③ ④ ⑤

得到了豆豆的幫助，你覺得：

13. 樂意以後多幫助豆豆 ① ② ③ ④ ⑤
14. 樂意以後多幫助其他人 ① ② ③ ④ ⑤

後來，豆豆參加一個社會調查活動需要請儘量多的人填寫問卷。豆豆拿給你一些空白問卷，問你可不可以當天請你的朋友家人填寫，越多人填寫越好。當天你也有一些自己的事情要做。

在這種情況下，你覺得：

15. 我覺得樂意花一些時間幫助豆豆 ① ② ③ ④ ⑤

對於要幫助豆豆，你會怎麼做？

16. 我會盡可能利用當天時間的：
- ① 很小部分幫助豆豆
 - ② 小部分幫助豆豆
 - ③ 一半幫豆豆，另一半做自己的事
 - ④ 大部分幫助豆豆
 - ⑤ 絕大部分幫助豆豆

經過一些時間，你把填寫好的問卷交給了豆豆。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

17. 我覺得感謝豆豆 ① ② ③ ④ ⑤
18. 我覺得欠了豆豆的情 ① ② ③ ④ ⑤

Appendix J Vignettes for Offer Condition in Study 2b

以下題目是想了解你在**特定情況**下的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量**把自己放在所描述的情境當中**，根據你在那樣的情境之下會產生的**感覺和想法**，來回答以下問題。

情境一

你正在為一個以環保為主題的全校比賽做準備。**樂樂**知道後，告訴你她（他）有一本重要的參考書一定會對你有幫助，並且主動提出借給你使用。雖然書被朋友拿去看了，**樂樂**還是去朋友家把書拿回來。第二天上學時**樂樂**把沉重的上下兩冊書都帶給了你。這兩冊書確實包含很多有用的資料。後來，你在比賽中獲得了優異獎。

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
考慮到樂樂的幫助是她（他）主動提供的，你覺得：					
1. 開心	①	②	③	④	⑤
2. 不好意思給樂樂添了麻煩	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回報樂樂	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 幸運	①	②	③	④	⑤

11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤
得到了樂樂的幫助，你覺得：					
13. 樂意以後多幫助樂樂	①	②	③	④	⑤
14. 樂意以後多幫助其他人	①	②	③	④	⑤

過了一段時間，**樂樂**因為參與一個項目，需要在網上查找很多資料。**樂樂**問你可不可以當天幫她（他）查找其中一部分資料。當天你也有一些功課要忙。

在這種情況下，你覺得：

15 我覺得樂樂花一些時間為樂樂查找資料

① ② ③ ④ ⑤

對於要為樂樂查找資料，你會怎麼做？

16 我會盡可能利用當天時間的：

- ① 很小部分幫助樂樂
- ② 小部分幫助樂樂
- ③ 一半幫樂樂，另一半做自己的事
- ④ 大部分幫助樂樂
- ⑤ 絕大部分幫助樂樂

你花了一些時間找到樂樂需要的資料，並給了她（他）。你得知樂樂已經收到了。

你已經回報了樂樂的幫助。此時，想到樂樂，你覺得：

17 我覺得感謝樂樂

① ② ③ ④ ⑤

18 我覺得欠了樂樂的情

① ② ③ ④ ⑤

情境二

因為數學基礎不太好和請假的原因，你的數學科跟不上進度了。你花了不少力氣補習，仍覺得有些吃力。有一天小息的時候，你正在看數學書，豆豆走到你身邊。得知你的困難，豆豆提出放學後給你講幾道難解的數學題。放學後，豆豆耐心地給你講解，解開了你的很多疑問。可是，因為花很多時間給你講題，豆豆錯過了搭校車，只好搭巴士回家。

考慮到豆豆的幫助是她（他）主動提供的，你覺得：

1. 開心

① ② ③ ④ ⑤

2. 不好意思給豆豆添了麻煩

① ② ③ ④ ⑤

3. 感謝

① ② ③ ④ ⑤

4. 被關愛

① ② ③ ④ ⑤

5. 不安

① ② ③ ④ ⑤

6. 欠了豆豆的情

① ② ③ ④ ⑤

7. 無奈

① ② ③ ④ ⑤

8. 有必要回報豆豆

① ② ③ ④ ⑤

- | | | | | | | |
|-------|-----------|---|---|---|---|---|
| 9 | 自己是很有價值的人 | ① | ② | ③ | ④ | ⑤ |
| 10 | 幸運 | ① | ② | ③ | ④ | ⑤ |
| ----- | | | | | | |
| 11 | 內疚 | ① | ② | ③ | ④ | ⑤ |
| 12 | 輕鬆 | ① | ② | ③ | ④ | ⑤ |

得到了豆豆的幫助，你覺得：

- | | | | | | | |
|----|-------------------|---|---|---|---|---|
| 13 | 樂意以後多幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 14 | 樂意以後多幫助其他人 | ① | ② | ③ | ④ | ⑤ |

後來，豆豆參加一個社會調查活動需要請儘量多的人填寫問卷。豆豆拿給你一些空白問卷，問你可不可以當天請你的朋友家人填寫，越多人填寫越好。當天你也有一些自己的事情要做。

在這種情況下，你覺得：

- | | | | | | | |
|----|------------------------|---|---|---|---|---|
| 15 | 我覺得樂意花一些時間幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
|----|------------------------|---|---|---|---|---|

對於要幫助豆豆，你會怎麼做？

16. 我會盡可能利用當天時間的：
- ① 很小部分幫助豆豆
 - ② 小部分幫助豆豆
 - ③ 一半幫豆豆，另一半做自己的事
 - ④ 大部分幫助豆豆
 - ⑤ 絕大部分幫助豆豆

經過一些時間，你把填寫好的問卷交給了豆豆。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

- | | | | | | | |
|----|--------------------|---|---|---|---|---|
| 17 | 我覺得感謝 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 18 | 我覺得欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |

Appendix K Vignettes for Ambiguous Condition in Study 2b

以下題目是想了解你在**特定情況**下的感受和想法。下面是兩個假設情境，描述發生在你和你認識不久的朋友之間的事情。請你儘量把自己放在所描述的情境當中，根據你在那樣的情境之下會產生的**感覺和想法**，來回答以下問題。

情境一

你正在為一個以環保為主題的全校比賽做準備。在圖書館尋找資料的時候，你發現了一本重要的參考書，只是已經被別人借出了。你無意中跟樂樂提起這件事，沒想到樂樂說她（他）家裏有這本書。雖然書被朋友拿去看了，樂樂還是去朋友家把書拿了回來。樂樂第二天上學時把沉重的上下兩冊書都帶给了你。這兩冊書確實包含很多有用的資料。後來，你在比賽中獲得了優異獎。

	完全不覺得	有點覺得	中等程度地覺得	強烈地覺得	非常強烈地覺得
不清楚樂樂的幫助是出於你的要求，還是樂樂的主動提供，你覺得：					
1. 開心	①	②	③	④	⑤
2. 不好意思給樂樂添了麻煩	①	②	③	④	⑤
3. 感謝	①	②	③	④	⑤
4. 被關愛	①	②	③	④	⑤
5. 不安	①	②	③	④	⑤

6. 欠了樂樂的情	①	②	③	④	⑤
7. 無奈	①	②	③	④	⑤
8. 有必要回報樂樂	①	②	③	④	⑤
9. 自己是很有價值的人	①	②	③	④	⑤
10. 幸運	①	②	③	④	⑤
11. 內疚	①	②	③	④	⑤
12. 輕鬆	①	②	③	④	⑤
得到了樂樂的幫助，你覺得：					
13. 樂意以後多幫助樂樂	①	②	③	④	⑤
14. 樂意以後多幫助其他人	①	②	③	④	⑤
A) 你是否傾向於覺得樂樂的幫助，是出於你的要求，或是出於樂樂主動提供呢？					
① 我覺得是出於我的主動要求					
② 沒有明確的想法					
③ 我覺得是出於樂樂的主動提供					

在這種情況下，你覺得：

- 15 我覺得樂意花一些時間為樂樂查找資料 ① ② ③ ④ ⑤

對於要為樂樂查找資料，你會怎麼做？

- 16 我會盡可能利用當天時間的：
- ① 很小部分幫助樂樂
 - ② 小部分幫助樂樂
 - ③ 一半幫樂樂，另一半做自己的事
 - ④ 大部分幫助樂樂
 - ⑤ 絕大部分幫助樂樂

你花了一些時間找到樂樂需要的資料，並給了她（他）。你得知樂樂已經收到了。

你已經回報了樂樂的幫助。此時，想到樂樂，你覺得：

- 17 我覺得感謝樂樂 ① ② ③ ④ ⑤
- 18 我覺得欠了樂樂的情 ① ② ③ ④ ⑤

情境二

因為數學基礎不太好和請假的原因，你的數學科跟不上進度了。你花了不少力氣補習，仍覺得有些吃力。有一天小息的時候，你正在看數學書，豆豆走到你身邊。得知你的困難，豆豆提出放學後給你講幾道難解的數學題。放學後，豆豆耐心地給你講解，解開了你的很多疑問。可是，因為花很多時間給你講題，豆豆錯過了搭校車，只好搭巴士回家。

考慮到豆豆的幫助是她（他）主動提供的，你覺得：

- | | 完全不覺得 | 有點覺得 | 中等程度地覺得 | 強烈地覺得 | 非常強烈地覺得 |
|-------------------------|-------|------|---------|-------|---------|
| 1. 開心 | ① | ② | ③ | ④ | ⑤ |
| 2. 不好意思給 <u>豆豆</u> 添了麻煩 | ① | ② | ③ | ④ | ⑤ |
| 3. 感謝 | ① | ② | ③ | ④ | ⑤ |
| 4. 被關愛 | ① | ② | ③ | ④ | ⑤ |
| 5. 不安 | ① | ② | ③ | ④ | ⑤ |
| 6. 欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |
| 7. 無奈 | ① | ② | ③ | ④ | ⑤ |
| 8. 有必要回報 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |

- | | | | | | |
|--------------------|---|---|---|---|---|
| 6. 欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |
| 7. 無奈 | ① | ② | ③ | ④ | ⑤ |
| 8. 有必要回報 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 9. 自己是很有價值的人 | ① | ② | ③ | ④ | ⑤ |
| 10. 幸運 | ① | ② | ③ | ④ | ⑤ |
| ----- | | | | | |
| 11. 內疚 | ① | ② | ③ | ④ | ⑤ |
| 12. 輕鬆 | ① | ② | ③ | ④ | ⑤ |

得到了豆豆的幫助，你覺得：

- | | | | | | |
|-----------------------|---|---|---|---|---|
| 13. 樂意以後多幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
| 14. 樂意以後多幫助其他人 | ① | ② | ③ | ④ | ⑤ |

B) 你是否傾向於覺得豆豆的幫助，是出於你主動要求，或是出於豆豆主動提供呢？

- ① 我覺得是出於我的主動要求
- ② 沒有明確的想法
- ③ 我覺得是出於豆豆的主動提供

後來，豆豆參加一個社會調查活動需要請儘量多的人填寫問卷。豆豆拿給你一些空白問卷，問你可不可以當天請你的朋友家人填寫，越多人填寫越好。當天你也有一些自己的事情要做。

在這種情況下，你覺得：

- | | | | | | |
|----------------------------|---|---|---|---|---|
| 15. 我覺得樂意花一些時間幫助 <u>豆豆</u> | ① | ② | ③ | ④ | ⑤ |
|----------------------------|---|---|---|---|---|

對於要幫助豆豆，你會怎麼做？

16. 我會盡可能利用當天時間的：
- ① 很小部分幫助豆豆
 - ② 小部分幫助豆豆
 - ③ 一半幫豆豆，另一半做自己的事
 - ④ 大部分幫助豆豆
 - ⑤ 絕大部分幫助豆豆

經過一些時間，你把填寫好的問卷交給了豆豆。

你已經回報了豆豆的幫助。此時，想到豆豆，你覺得：

- | | | | | | |
|------------------------|---|---|---|---|---|
| 17. 我覺得感謝 <u>豆豆</u> 。 | ① | ② | ③ | ④ | ⑤ |
| 18. 我覺得欠了 <u>豆豆</u> 的情 | ① | ② | ③ | ④ | ⑤ |

Appendix L Table of results for emotional responses compared between gift situation and helping situation in Study 2a

Table 4. Paired T-tests for emotional responses in V1 (gift situation) and V2 (helping situation) in Study 2a

Pair	Variable	No Expectation n = 42			Expectation n = 37			Ambiguous n = 44		
		Mean	SD	t	Mean	SD	t	Mean	SD	t
1	happy-gift	4.38	1.01	-.31	3.16	1.17	5.43***	4.64	.57	.60
	happy-help	4.43	.70		2.03	1.14		4.57	.76	
2	cared-gift	4.05	1.08	-.59	2.97	1.26	3.79**	4.07	.93	-2.07*
	cared-help	4.14	1.10		2.14	.95		4.34	.91	
3	valued-gift	2.52	1.22	-.48	2.62	1.34	1.93	2.68	1.38	.00
	valued-help	2.60	1.31		2.32	1.25		2.68	1.29	
4	surprised-gift	4.36	.93	2.95**	3.05	1.39	3.44**	4.30	.95	1.96
	surprised-help	3.90	1.32		2.22	1.21		4.02	1.17	
5	relieved-gift	3.05	1.21	2.06*	2.92	1.34	3.60**	2.98	1.44	-1.46
	relieved-help	2.74	1.27		2.03	1.04		3.18	1.42	
6	annoy-gift	1.26	.73	.90	1.92	1.12	-4.34***	1.07	.26	-1.09
	annoy-help	1.19	.59		2.89	1.15		1.18	.69	
7	uneasy-gift	1.43	.77	.78	1.57	.93	-4.92***	1.39	.87	.26
	uneasy-help	1.31	.75		2.76	1.32		1.34	.94	
8	Wu-Nai-gift	1.36	.66	.89	1.81	1.10	-4.31***	1.30	.80	.42
	Wu-Nai-help	1.26	.63		2.95	1.43		1.25	.62	
9	guilt-gift	1.69	1.02	1.39	1.38	.72	-1.98	1.89	1.26	3.17**
	guilt-help	1.50	.97		1.76	1.09		1.43	.93	

Note: * p < .05; ** p < .01; *** p < .001

happy-gift = item response to "happy"(5-point) in gift situation; happy-help = item response to "happy"(5-point) in helping situation

Appendix M Table of results for emotional responses compared between low-cost situation and high-cost situation in Study 2b

Table 5. Paired T-tests for emotional responses in V1 (low-cost situation) and V2 (high-cost situation) in Study 2b

Pair	Variable	Request n = 41			Offer n = 42			Ambiguous n = 43		
		Mean	SD	t	Mean	SD	t	Mean	SD	t
1	happy-low	4.00	.95	.48	4.36	.76	1.36	3.74	1.24	1.95
	happy-high	3.93	1.01		4.19	1.07		3.35	1.33	
2	cared-low	3.39	1.16	-3.43**	3.95	1.15	-.89	3.84	.97	-2.20*
	cared-high	3.66	1.24		4.05	1.19		4.16	.87	
3	valued-low	2.46	1.12	-1.36	2.50	1.22	-1.50	2.84	1.15	-.72
	valued-high	2.61	1.34		2.74	1.21		2.98	1.37	
4	lucky-low	3.46	1.23	.00	3.55	1.40	-1.04	3.74	1.14	1.83
	lucky-high	3.46	1.23		3.67	1.39		3.44	1.28	
5	relieved-low	2.98	1.06	2.82**	3.26	1.17	3.12**	2.60	1.31	1.86
	relieved-high	2.51	1.10		2.74	1.40		2.31	1.26	
6	<i>Bu-Hao-Yi-Si</i> -low	3.56	1.07	-3.48**	3.76	1.10	-2.05*	4.12	.94	-2.3*
	<i>Bu-Hao-Yi-Si</i> -high	4.00	1.18		4.10	1.06		4.40	.70	
7	uneasy-low	1.61	.74	-3.19**	1.36	.66	-1.70	1.91	.87	-4.68***
	uneasy-high	2.22	1.35		1.64	1.03		2.79	1.44	
8	<i>Wu-Nai</i> -low	1.27	.55	-1.84	1.36	.76	-.24	1.53	.94	-3.52**
	<i>Wu-Nai</i> -high	1.46	.78		1.38	.83		2.19	1.33	
9	guilt-low	1.44	.71	-4.27***	1.64	1.12	-2.79**	2.09	1.19	-4.40***
	guilt-high	2.27	1.27		2.21	1.47		2.95	1.43	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

happy-low = item response to "happy"(5-point) in low-cost situation; happy-high = item response to "happy"(5-point) in high-cost situation