Attachment and mental health for Chinese and Japanese youth: the role of personality, coping with stress, and culture

日本と中国の若者におけるアタッチメントとメンタルヘルスとの関連:パーソナリティ、ストレスコーピングおよび文化的要因からの検討

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Table of Contents

Part I Overview of Study

Chapter 1: Introduction

According to Bowlby (1969/1982, 1973, 1980), the way in which individuals interact with primary caregivers in childhood shapes their beliefs, expectations, attitudes about the self and others. These interpersonal thoughts, which are central features of internal working models, guide how people think, feel, or behave, especially when they are distressed (Simpson & Rholes, 2012). Therefore, attachment theory provides a powerful framework for understanding both the nature of close relationships and the links between mental representations in intimate relations, patterns of emotion regulation, and psychopathology (Bowlby, 1969/1982, 1973, 1980). As a consequence, it has generated tremendous clinical interest (e.g., Fonagy et al., 1996; Muller, Sicoli, & Lemieux, 2000).

Understanding how attachment affect mental health could help psychologists target those underlying mechanisms in therapy, which may be more amenable to therapeutic change (Raque-Bogdan, Ericson, Jackson, Martin, & Bryan, 2011). However, precisely how attachment links to related clinical constructs such as personality disorders (PDs), general mental health; and how it can be used clinically to improve individuals' mental health, are still unclear.

Culture plays a critical role in the explanation of the development and functioning of relationships because it defines and transmits the "norms, roles, rules, customs, understandings and expectations" through which individuals relate to others (Berscheid, 1995). Bowlby explicitly stressed the contextual nature of attachment in his early writings (Bowbly, 1969/1982), but did not discuss how to integrate this nature into attachment research. By now, a few studies have focused on whether and how basic attachment findings gleaned from people in Western cultures hold true within, or are qualified by, non Western cultural heritages (e.g., Doherty, Hatfield, Thompson, & Choo, 1994; Wei, Russell, Mallinckrodt, & Vogel, 2007). However, little is known about the differences in attachment dynamism between different Asian cultural systems, such as those in China and Japan and little research has focused on the effect of attachment in the acculturation progress within these two Asian cultures.

On the basis of reviewing existing literature, the present dissertation focused on adult attachments and attempts to systematically explore the mechanisms through which attachment affects mental health from three aspects: personality development theory (personality traits, personality deviations, self-esteem,), cognitive and behavioral system (coping with stress), and cultural perspective (acculturation modes, cross-cultural comparison). Furthermore, both the positive (QOL) and negative (personality deviations and GHQ) aspects of mental health were measured in the present study.

The present study primarily focused on understanding the attachment-mental health linkage mechanisms in non-clinical samples, which may be more meaningful and valuable for improving the

status of mental health. Suggestions for the issues of prevention and intervention can be provided for general normal populations to improve their attachment relationships or to deal with psychological problems, which in turn promote mental health.

Also, the present study aimed at understanding the nature of attachment in Asian cultures through comparing the similarities and differences in attachment and its relationships to other variables between Japanese and Chinese samples, and investigating role of attachment in acculturation process on changing the status of mental health, which can expand the knowledge of attachment across culture.

This literature review is organized into five major sections. The first section provides a general theoretical framework for attachment and addresses the development and application of adult attachment instruments. The second section highlights the connection between attachment and mental health and reports fundamental research findings. The third section focuses on the research supporting a connection between attachment and personality, personality disorders and introduces Millon's personality model. The fourth section highlights the mediating effects of coping with stress, self-esteem and reviews the literature related to attachment. The fifth section focuses on attachment and culture. The acculturation model and the comparison between Japan and China are addressed.

Chapter 2: Review of literature

1 Attachment theory

1.1 Origins of Attachment Theory

Attachment theory has its origins in the observation of and experiments with animals. Much of the early research on attachment in humans was done by Bowlby and his associates (1982/1969, 1973, 1980). "Drawing on concepts from ethology, cybernetics, information processing, developmental psychology, and psychoanalysis, Bowlby formulated the basic tenets of attachment theory" (Bretherton, 1992).

According to Bowlby (1969/1982), attachment means an affectional bond or tie between an individual and an attachment figure (usually a caregiver), and distinct qualities of the caregiver-child bond come to regulate children's emotional experience and behavior. The attachment behavioral system serves to maintain or achieve closer proximity to the attachment figure (Prior, & Glaser, 2006), and attachment behavior has both a protective and an instructive function. The protective function serves to seek the proximity of the child's preferred attachment figure for security and comfort when he/she meets danger. When there is no danger, the instructive function of attachment is indicated, as the preferred attachment figure becomes a secure base from which the child can interact with and explore its new surroundings (Bowlby, 1988; Krause & Haverkamp, 1996; Peluso, Peluso, White, & Kern, 2004).

Some of the most important empirical studies designed to identify and classify attachment behaviors are associated with Mary Ainsworth and her colleagues (Ainsworth, Blehar, Waters, & Wall, 1978; Bell & Ainsworth, 1972). Ainsworth's (Ainsworth et al., 1978) research with the Strange Situation Protocol helped to establish three commonly accepted child-caregiver attachment patterns: secure, anxious-ambivalent, and avoidant. Securely attached infants explore their environment, looking back at their caregiver periodically (Ainsworth, 1985). They show some distress when separated but are easily comforted upon reunion as evidenced by smiling, vocalization, waving, and seeking contact. Anxious-ambivalent infants typically do not explore their environment and choose instead to cling to their caregivers (Ainsworth, 1985). They display extreme agitation upon separation. Upon reunion, these infants seek contact while arching away from the caregiver, resisting all efforts to be comforted. Avoidant infants display a pervasive indifference before and after separation (Ainsworth, 1985). These children avoid their caregiver upon his or her return. In these relationships, the infants' attempts for comfort and protection have presumably been rebuffed or rejected.

In several studies, it was noted that many infants did not fall into any of the original three categories previously described. Main, Kaplan, and Cassidy (1985) proposed a fourth attachment pattern,

disorganized attachment, to describe infants who displayed a pronounced mixture of ambivalent and avoidant patterns of behavior.

1.2 Internal working models of attachment and attachment's continuity

A central tenet of attachment theory is that the child, along with these distinct patterns of proximity-seeking behavior or responding to the caregiver, will develop a stable internal working model (IWM) about the age of 4 or 5 years (Bowlby, 1973). The belief of their own ability to elicit need-meeting responses from their caregivers, as well as the expectations of the accessibility and responsiveness of their caregiver, are internalized to the model, and then the model influences his or her behavior, affect, ideas of the self and others (Ainsworth et al. 1978; Bowlby, 1969/1982; Verschueren, Marcoen, & Schoefs, 1996), and future interactions with the environment and other social relationships (Belsky & Nezworski, 1988; Sroufe, 1988). Therefore, the working models can be distanced between working models of self and of others. Working model of the self refers to a sense of his or her own worthiness of love and care and working model of others refers to the expectations concerning the availability and responsiveness of others (Verschueren et al., 1996).

According to the internal working model, once attachment bonds are stabilized during infancy and early childhood, they tend to persist in subsequent years especially in stable child-rearing environments (Bowlby, 1988), although they may undergo transformations and re-integrations during later years when meeting with important events. Thus Bowlby (1969/1982) believed that attachment is an important component of human experience "from the cradle to the grave".

1.3 Measurements of adult attachment

In recent years attachment theory and research have advanced in the study of attachment across the life span (Bretherton, 1992). Attachment researchers have extended their study of attachment to the developmental periods of adolescence and adulthood (Bartholomew & Horowitz, 1991; Collins & Read, 1990; Griffin & Bartholomew, 1994; Hazen & Shaver, 1990). Because of growing interest in self-report research on adolescent and adult attachment, more than 100 kinds of measure instruments had emerged. The pace of progress in the field of adult attachment depends in a large part on whether and to which degree the instruments are effective. By now, measures used with older children and adults are generally based on questionnaire and interview methods, with the item content tapping either perceptions of early family relationships, or current feelings and attitudes towards close relationships.

One of the more popular and widely researched models of adult attachment is that developed by Bartholomew and Horowitz (1991). Drawing on Bowlby's (1973) notion of working models of self and others, they proposed a four-category system of adult attachment that organizes a person's working models along two dimensions: (1) the distinction between self and others and (2) valence (positive

versus negative), and developed questionnaire and interview measures to assess the styles in adolescents and adults. The four categories are secure, preoccupied or anxieous-ambivalent, dismissing avoidance, and fearful avoidance. Secure attachment is marked by comfort with intimacy and with autonomy, and assessed by items such as “It is relatively easy for me to become emotionally close to others”. The preoccupied or anxious-ambivalent attachment is marked by overdependence and desire for extreme closeness, and assessed by items such as “I often find that others are reluctant to get as close as I would like” The other two styles represent contrasting forms of avoidance. Dismissing avoidance involves an emphasis on self-reliance and achievement, together with devaluation of close relationships; it is assessed by items such as “I prefer not to depend on others or have others depend on me”. Fearful avoidance, on the other hand, involves distrust and fear of rejection, and is assessed by items such as “I sometimes worry that I will be hurt if I allow myself to become too close to others”.

However, as argued by Collins & Read (1990), an analysis of the continuous attachment dimensions can often provide a more precise understanding of attachment processes by specifying which component of one’s working model is most critical to a given relation. Therefore, the instruments of measuring attachment dimensions tend to be more reliable and sensitive than categorical measurement of attachment styles. According to this, Collins and Read (1990) developed the Adult Attachment Scale (AAS), which is an 18-item self-report questionnaire to measure attachment orientations. Three subscales were confirmed, labeled Depend (the extent to which subjects feel able to trust others and to depend on them to be available when needed), Anxiety (anxiety in relationships, such as fear of being abandoned and not being loved), and Close (the extent to which subjects feel comfortable with closeness and intimacy).

In another case, Brennan, Clark, and Shaver (1998) developed the Experiences in Close Relationships Scale (ECRS), which has become one of the most widely used self-report measures of adult attachment. In this instrument, two relatively orthogonal dimensions (labeled anxiety and avoidance) are identified with factor analysis study of items from all of the available self-report measures of adult attachment as well as items from some instruments that appeared only in conference presentations. The anxiety dimension is marked by a chronic fear of interpersonal rejection and abandonment, whereas the avoidance dimension is characterized by a pervasive discomfort with intimacy and interpersonal closeness.

2 Attachment and mental health

The same principles thought to underlie links between attachment and psychopathology in infancy are being applied to adults (Shaver & Clark, 1994; Shaver & Hazan, 1993). According to attachment

theory, attachment insecurity interferes with the development of a secure, stable mental foundation; reduces resilience in coping with stressful life events; and predispose a person to break down psychologically in times of crisis (Bowlby, 1988). Attachment insecurity can therefore be viewed as a general vulnerability to mental problems, but the particular symptomatology depends on genetic, developmental, and environmental factors (Mikulincer & Shaver, 2012).

A lot of research has shown that attachment insecurity was common among both clinical and non-clinical samples with a wide variety of physical and psychological symptoms, ranging from mild distress to severe personality disorders and even schizophrenia (Mikulincer & Shaver, 2007). For example, attachment insecurities are associated with depression (e.g., Merlo & Lakey, 2007; Rholes et al., 2011), clinically significant anxiety (e.g., Bosmans, Braet & Van Vlierberghe, 2010), post-traumatic stress disorder (PTSD) (e.g., Ein-Dor, Doron & Solomon, 2010), eating disorders (e.g., Kenny & Hart, 1992; Latzer, Hochdorf, Bachar & Canetti, 2002), and unexplained physical complaints (Taylor, Mann, White & Goldberg, 2000). They are also found to be associated with dysfunctional assumptions (Andersson & Perris, 2000), negative affectivity (Simpson, 1990), neuroticism (Shaver & Brennan, 1992), low self-esteem (Brennan & Morris, 1997), and maladaptive strategies for coping with negative affect (Brennan & Shaver, 1995).

If attachment insecurities are risk factors for psychopathology, then a sense of attachment security should improve mental health (Mikulincer & Shaver, 2012). According to attachment theory, individuals with available and supportive experiences from attachment figures have more trigger positive emotions and a sense of safety which provide psychological resources for dealing with problems and adversities. Secure individuals remain relatively unperturbed when facing with stress, recover faster from episodes of distress, and experience longer periods of positive affectivity, which contributes to their overall emotional well-being and mental health. For example, some research has shown that attachment securities are related to resilience (Svanberg, 1998), self-esteem (Paterson, Pryor & Field, 1995), and healthy adjustment (Burge et al., 1997).

Mental health remains a contested concept which can be defined and measured in various ways, including positive indicators (such as life satisfaction) and negative indicators (such as depression). Importantly, the absence of mental illness does not equate to the presence of mental health; instead, "the absence of disease may constitute a necessary, but not sufficient, criterion for mental health" (Jahoda, 1958). Although the associations between attachment and mental health have been widely discussed, more research is still required to clear up the psychological processes and underlying mechanism between them. In the present study, mental health are examined in terms of traditional indicators of psychopathology (i.e. personality deviations and one negative indicator: general mental

health) as well as the presence of positive indicators of functioning (i.e., quality of life) to fill gaps of knowledge on links between attachment and mental health in Japan and China.

3 Attachment and personality traits/personality disorders

3.1 Attachment and personality traits

Due to attachment theory's relevance for the study of personality structure and organization (Bowlby, 1988), adult attachment research has focused on normal personality functioning (Duggan & Brennan, 1994; Shaver & Brennan, 1992). Genetically influenced personality traits have been considered to play an important role in attachment dynamics and close relationships in adulthood (Donnellan, Burt, Levendosky & Klump, 2008).

Adult attachment has been shown to be related to personality traits. For example, Bartholomew and Horowitz (1991) demonstrated that dismissing individuals and fearful avoidant individuals differed in their personality descriptions. Based on self- and peer reports, dismissing individuals appeared "cold", and were described as "competitive", "autocratic", and "introverted". Fearful avoidant individuals, in contrast, appeared "submissive", and were described by themselves and peers as "sub-assertive", "introverted", and "exploitable".

Most of research about attachment and personality traits focused on the Big Five. Bakker, Pieter & Karen (2004) found significant positive correlations between secure attachment and Extraversion and Emotional Stability of the Big Five. Carver (1997) found that the positive correlation between secure attachment style and the personality traits of agreeableness and extraversion, and a negative correlation of ambivalent attachment style and Neuroticism. Noftle and Shaver (2006) reported that there were consistent and theoretically meaningful associations between the two attachment orientations and the BFI and NEO-PI-R of the Big Five, both attachment avoidance and attachment anxiety are positively associated with Neuroticism and negatively with other four factors of the Big Five. In a study of Villanueva (2012) which explored the relationships between AAS and the Big Five, "Close" dimension of AAS has a positive association with Extraversion, Agreeableness, and Consciousness and a negaive association with Neuroticism. "Depend" dimension of AAS has a positive association with Extraversion and a negaive association with Neuroticism. "Anxiety" dimension of AAS has a positive association with Neuroticism and a negaive association with Extraversion, Openness and Consciousness.

3.2 Attachment and personality disorders

Some personality disorders are characterized by patterns of disordered cognitions (as in the Schizotypal and Obsessive-Compulsive disorders). Others are characterized by problems with emotions (as in the Histrionic and Borderline personality disorders). Virtually all personality disorders,

however, are characterized by persistent difficulties in interpersonal relations, which is often their central feature (Widiger & Frances, 1985). For example, the Schizoid character appears defensively devoid of any interest in human interaction, whereas the Dependent character appears incapable of functioning without the aid of a close other (Livesley, Schroeder, & Jackson, 1990). Similarly, the Avoidant personality disorder is typically characterized by a simultaneous desire for, and fear of, close relationships (Sheldon & West, 1990).

Therefore, some research has discussed the possible connections between personality disorders and attachment theory (Gacano, Meloy, & Berg, 1992; Heard & Lake, 1986; West, Rose, & Sheldon-Keller, 1994), because attachment theory is known as another approach to personality development which has intimate association to quality of interpersonal relationships. Brennan and Shaver (1998) investigated whether adult attachment and personality disorders share a common underlying structure, and the results indicated substantial overlap between attachment and personality disorders. Furthermore, there is increasing support for conceptualizing personality disorders as disorders of attachment (e.g., Heard & Lake, 1986; Shaver & Clark, 1994; West & Sheldon, 1988).

West, Rose, & Sheldon-Keller (1994) have distinguished between dependent and schizoid personality disorders on the basis of an "enmeshed" (i.e., preoccupied) versus a "detached" (i.e., dismissing) interpersonal pattern. Meyer, Pilkonis, & Beevers (2004) found that borderline personality disorder was associated with attachment anxiety, avoidant personality disorder was associated with attachment anxiety and avoidance, and schizoid personality disorder was weakly associated only with attachment avoidance. Similarly, researchers have observed associations between recollections of insecure attachments with one or both parents and the Self- Defeating personality disorder (Williams & Schill, 1994). Among those diagnosed with Avoidant personality disorder, Sheldon and West (1990) reported that heightened desire for and fear of attachment relationships were more diagnostic of Avoidant personality disorder than poor social skills. Sack, Sperling, Fagen and Foelsch (1996) compared individuals with a diagnosis of Borderline personality disorder to an unselected group of college students, and found evidence of more attachment-related distress (e.g., fear of loss, separation protest, compulsive care-seeking, angry withdrawal) as well as a mixture of general ambivalent and avoidant tendencies in romantic/sexual attachment relationships. Their findings indicate that both preoccupation and fearful avoidance may be most closely associated with the Borderline personality disorder.

3.3 Millon's model of personality

Most of personality instruments separately measure either normal personality traits (e.g., BFI) or personality disorders (e.g., PDQ). They hardly measure the two ones simultaneously. However,

according to Millon's personality model (1969/1986), normal and abnormal personalities lie in a continuum with no sharp demarcation to distinguish the two. To address the interface between normal and abnormal personality, Strack's "Personality Adjective Check List" (PACL) (1987) was used in the present study to measure both personality traits and personality disorders.

Millon is an American psychologist known for his work on personality disorders and his contributions to the development of earlier versions of the DSM (1981). Millon (1986) presented his original personality theory on basis of biosocial-learning theory in modern psychopathology. Millon's (1986) assumptions about normal personality were outlined as follows: (a) normal and abnormal personality are shaped according to the same basic processes and learning principles; (b) normal personality is on a continuum with pathological personality; (c) no sharp dividing line exists between normal and abnormal personality types; and (d) normal personality patterns may be distinguished from pathological patterns by their adaptive flexibility and balance on the active–passive, pleasure–pain, and self–other polarities.

According to Millon's model, normal and abnormal personalities share similar traits, behaviors, and background characteristics. The major difference is the "character, timing, intensity, or persistence of certain influences" (Millon, 1986) that cause some people to develop exaggerated, rigid, or maladaptive characteristics when most others do not. The continuous relation between the domains of normality and pathology in Millon's model allows personologists to study the ways in which healthy and disordered personalities are similar and different, the developmental processes that lead to various outcomes, and perhaps most important, how disordered individuals may be restored to healthy functioning.

In the light of instrumental coping patterns designed to maximize positive reinforcements and avoid punishment, the model crossed the active-passive axis with four reinforcement strategies (detached, dependent, independent, and ambivalent) to derive eight basic personality traits and eight corresponding personality disorders (see table 2.1).

Despite its heavy clinical orientation, Millon's model is appropriate for non-deviant population as well as deviant individuals. Seeing the value of both studying the normal and abnormal populations with Millon's theory, Strack (1987) developed the instrument of PACL as a non-clinical tool capable of assessing each of Millon's personality types among a sample of normal adults and counseling patients. The eight personality traits or types for describing an individual's personality as well as personality disorders when these types are extended to pathological extremes include forceful (antisocial), sociable (histrionic), sensitive (passive-aggressive), inhibited (avoidant), confident (narcissistic), cooperative (dependent), respectful (compulsive), and introversive (schizoid). The problem indicator includes three

more severe types (schizotypal, cycloid, and paranoid).

Table 2.1 Normal personality traits and personality disorders in Millon's model

4 Mediating effects between attachment and mental health

4.1 Coping as a mediator

4.1.1 Coping theory

According to the transactional model of stress and coping (Lazarus & Folkman 1986), psychological stress is viewed as "a relationship with the environment that the person appraises as significant for his or her well-being and in which the demands tax or exceed available coping resources". This definition points to two processes as central mediators within the person–environment transaction: cognitive appraisal and coping.

Lazarus and Folkman (1984) define coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person". Coping theories can be classified according to orientation or focus (trait-oriented or state-oriented) and approach (macroanalytic or microanalytic) (Krohne, 2001). The trait-oriented theory aims at the early recognition of a person's coping resources and tendencies, which can offer the opportunity for establishing a selection (or placement) procedure or a successful primary prevention program. The state-oriented theory focuses on the actual coping of an individual and the outcome of his application of coping methods or strategies, which lays the foundation for a general modificatory program to improve coping efficacy. Microanalytic approach studies a large number of specific and concrete coping strategies, while the macroanalytic approach operates at a higher level of abstraction and concentrates on fundamental and abstract coping methodologies.

The concept of appraisal is based on the idea that emotional processes (including stress) are dependent on actual expectancies that persons manifest with regard to the significance and outcome of a specific encounter (Lazarus, 1991). These appraisals are determined by a number of personal and situational factors. The most important factors on the personal side are motivational dispositions, goals, values, and generalized expectancies (Krohne, 2001).

Appraisal process is distinguished to two basic forms, primary and secondary appraisal (Lazarus, 1991). Primary appraisal concerns something of relevance to the individual's well-being. Within primary appraisal, three components are distinguished: Motivational relevance describes the extent to which an encounter refers to issues about which the person cares; Motivational congruence defines the extent to which an episode proceeds in accordance with personal goals; Type of ego-involvement designates aspects of personal commitment such as self-esteem, moral values, ego-ideal, or ego-identity. On the other hand, secondary appraisal concerns people's evaluation of their resources

and options for coping (Lazarus, 1991). Likewise, within secondary appraisal, three components are also distinguished: Blame or credit results from an individual's appraisal of who is responsible for a certain event; Coping potential means a person's evaluation of the prospects for generating certain behavioral or cognitive operations that will positively influence a personally relevant encounter; Future expectations refer to the appraisal of the further course of an encounter with respect to goal congruence or incongruence.

4.1.2 Attachment and coping

Recently, in adult attachment studies, several authors (e.g., Compas, Forsythe, & Wagner, 1988; Skinner & Edge, 1998) have argued that attachment theory may have particular relevance in understanding coping. The attachment system acts as a kind of homeostatic mechanism for modulating anxiety and stress by seeking proximity or closeness to supportive attachment figures (Bowlby, 1978; Schore, 2001). This behavior of seeking physical security or comfort can be understood as a way of coping with stressful situations (Janssen, Schuengel, & Stolk, 2002).

On the other hand, individuals develop their internal working models of attachment and thus have belief and expectations of themselves and others. This cognitive component is similar to the appraisal of coping theory. In another word, both attachment and coping involve cognitive interpretations of stressful events and decisions regarding how much trust to place in self and others. The attachment relationship facilitates the expansion of the child's coping capacities (Schore, 2001).

According to the working models of self and others, the individuals with attachment anxiety, who do not trust themselves to be worthy and always worry about being abandoned, tend to chronically activate (or hyperactivate) their attachment system in an attempt to minimize the distance from the attachment figure and elicit their support. Conversely, the individuals with attachment avoidance, who do not trust others and always avoid getting close to others, use more deactivation strategies to maximize the distance from the attachment figure and avoid painful experiences (Kobak & Sceery, 1988).

Research has shown that the two attachment dimensions (Anxiety and Avoidance) are associated with different and distinct coping (e.g., Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Belizaire & Fuertes, 2011), but the results have not been completely consistent with the expectations of the attachment theory. In Lopez and his colleagues' study (2001), attachment anxiety orientation was found to be significantly and negatively related to reactive coping, but not significantly correlated with suppressive coping. Attachment avoidance was found to be significantly and negatively related to both reactive coping and suppressive coping. In another study (Lopez, Mitchell, & Gormley, 2002), attachment anxiety were significantly and negatively related to both reactive coping and suppressive

coping, but attachment avoidance had no significant association with the two coping strategies. Belizaire & Fuertes (2011) used COPE inventory to study Haitian immigrants in the U.S., and found that anxiety attachment was positively associated with both adaptive coping and maladaptive coping, while avoidance attachment had only negative association with adaptive coping.

Although secure children may be viewed as using more effective coping mechanisms and thereby perceiving less stress impact compared to less secure children (Compas et al., 1988), more research is still needed to make clear of the relationships between attachment and coping.

4.1.3 Coping and mental health

Schore (2001) provided a deeper understanding of the psychoneurobiological mechanisms that underlie mental health. The infant's early developing right hemisphere is dominant for the human stress response. Adaptive infant's mental health can be fundamentally defined as the earliest expression of flexible strategies for coping with the novelty and stress that is inherent in human interactions (Schore, 2001).

Studies have examined the links between perceived stress, coping behaviors and mental health outcomes. For instance, perceived stress is both a predictor and an outcome of depression. Anger coping strategy employed to deal with stress actually exacerbates the stress, while use of adaptive coping strategies decreases perceived stress (Galaif et al., 2003). As perceived stress is linked to psychopathology (Schmeelk-Cone & Zimmerman, 2003), coping strategies that result in increasing perceived stress may place individuals at risk for experiencing mental health problems. Suldo, Shaunessy, & Hardesty (2008) studied the relationships between coping strategies and positive and negative mental health indicators. Positive appraisal and family communication had a positive association with life satisfaction, and perceived stress, negative avoidance, anger had a negative association with it. Perceived stress, negative avoidance, anger were positively related to internalizing problem behaviors (anxious/depressed, withdrawn/depressed, and somatic complaints) and externalizing problem behaviors (rule breaking and aggressive behaviors). Family communication was negatively related to externalizing symptoms. Furthermore, coping styles (specifically, anger and positive appraisal) moderate the influence of stress on life satisfaction and internalizing symptoms of psychopathology (Suldo, Shaunessy, & Hardesty, 2008).

4.1.4 Attachment, coping and mental health

A few studies have also discussed the mediating effects of coping responses on attachment and psychological outcomes (e.g., Wei, Vogel, Ku, & Zakalik, 2005; Wei, Heppner, & Mallinckrodt, 2003; Schottenbauera et al., 2006). Wei, Heppner, & Mallinckrodt (2003)'s study indicated that perceived coping fully mediated the relationship between attachment anxiety and psychological distress and

partially mediated the relationship between attachment avoidance and psychological distress. In Wei et al.' study (2005), the association between attachment anxiety, negative mood, and interpersonal problems was found to be mediated only by emotional reactivity (not emotional cutoff), while the association between attachment avoidance, negative mood, and interpersonal problems was mediated only by emotional cutoff (not emotional reactivity). Schottenbauera et al. (2006) found that avoidance coping was a significant mediator of ambivalent attachment qualities and affective resolution, as well as avoidant attachment qualities and affective resolution. Research suggests that individuals with high levels of attachment anxiety and avoidance tend to use ineffective coping strategies to deal with stress, which in turn increases their feelings of distress (Wei et al., 2005).

4.2 Self-esteem as a mediator

4.2.1 Attachment and self-esteem

Self-esteem refers to self-judgments of personal worth and global feelings of competence and self-acceptance (Rosenberg, 1965). As discussed earlier, a positive trusting relationship with caregivers is expected to facilitate the development of an internalized view of self as capable and lovable (Arbon & Power, 2003). This may be the basis for self-esteem. Given the developmental relation between early childhood experiences and subsequent self-esteem, being loved and valued by close relationship partners would be a third source of security throughout life, like self-esteem and cultural worldviews (Hart, Shaver, & Goldenberg, 2005).

Several studies have reported that secure attachment is positively associated with adolescents' self-esteem (Armsden & Greenberg, 1987; Kenny, Lomax, Brabeck, & Fife, 1998; McCormick & Kennedy, 1994; Noom, Dekovic, & Meeus, 1999; Paterson, Pryor, & Field, 1995). Moreover, adult romantic attachment is correlated with adult self-esteem (Bylsma et al., 1997). According to Roberts, Gotlib, & Kassel (1996), insecure adult attachment styles are associated with dysfunctional attitudes, which in turn predispose individuals to lower levels of self-esteem. Such depletions in self-esteem are directly associated with increases in depressive symptoms over time. Insecure attachment appears to lead to depressive symptoms in adulthood through its impact on self-worth contingencies and self-esteem (Roberts, Gotlib, & Kassel, 1996).

4.2.2 Self-esteem and mental health

The level of self-esteem influences the way seeing the world and interpreting each situation we find ourselves in. High self-esteem promotes happiness, mental health (Taylor & Brown, 1988) and life satisfaction (Kwan, Bond, & Singelis, 1997). In contrast, low levels of self-esteem are associated with negative outcomes, including substance abuse, depressive mood, dissatisfaction with life, and lack of general well-being (Baldwin et al., 1989; Dekovic, 1999; Roberts et. al., 1996; Stacy, Sussman, Dent,

Burton, & Flay, 1992). Also, low self-esteem is associated with worse economic prospects, and higher levels of criminal behavior. (Trzesniewski, Donnellan, Moffitt, Robins, Poulton, & Caspi, 2006).

Although many studies examined the relationships between attachment and self-esteem or between self-esteem and mental health outcomes, little is known about the link between attachment, self-esteem and mental health, specially the mediating effects of self-esteem between attachment and mental health. In the present dissertation, the effect of self-esteem as a mediator on the relationship between attachment and mental health is also discussed.

5 Cultural influences on attachment

Scientific theory has two poles: generality and specificity. A culture-sensitive theory of attachment would enable psychologists to describe a universal attachment process and make sense of its specific cultural manifestations. Integration of attachment theory in many cultures should operate by studying the interaction between biological generality and cultural specifics and cultural similarities and differences.

Although Bowlby (1969/1982) suggested that the core components of attachment theory are culturally universal, empirical research replicating attachment findings with non-White adult samples is scarce. To examine the cross-cultural applicability of adult attachment perspectives, researchers have called for more empirical studies on non-White adult populations (Wang & Mallinckrodt, 2006; Wang & Ratanasiripong, 2010).

In this study, we examine two aspects of cultural influences on attachment, focusing on the cultures of Japan and China. First, we investigate whether the nature of attachment is culturally consistent between these two cultures by comparing the relationships of attachment, coping, and general mental health. Secondly, we investigate what role attachment plays in the acculturation process when Chinese students come to Japan to continue with their studies.

5.1 Attachment in the acculturation progress

5.1.1 The model of acculturation process

When an individual moves from one culture to another, he/she modifies many aspects of his/her self-identity in order to accommodate information and experiences within the new culture. This process is generally referred to as acculturation. Changes in the acculturation process may be observed in various domains such as attitudes, behaviors, values, and the sense of cultural identity.

The comprehensive model of the acculturation process has been widely used as a framework in contemporary research (Berry, Kim, Minde, & Mok, 1987). In this model, five important influences, or moderating factors, on the acculturation process are identified: (a) the nature of the larger society, (b) the type of acculturation group, (c) modes of acculturation, (d) demographic and social characteristics

of the individual, and (e) psychological characteristics of the individual. In the present part, three factors in Berry et al.'s model (1987) will be considered to examine their linkages to a successful adaptation, namely, the nature of the larger society (Japanese society), modes of acculturation, and psychological characteristics of the individual (i.e. attachment dimensions).

5.1.2 The role of attachment in acculturation process

Among these psychological characteristics, adult attachment has been considered as an important predictor of successful adaptation (Wang & Mallinckrodt, 2006). The immediate surroundings of the host culture are filled with novel stimuli that may be simultaneously intriguing and frightening. Successful adaptation during the acculturation process requires exploration of the new cultural landscape in ways that are significantly similar to how young children learn to explore their physical surroundings (Wang & Mallinckrodt, 2006). Bowlby (1988) believed that individuals who have an internalized sense of security develop their capacity to explore the environment (both physical and social) without the actual presence of attachment figures.

Thus, in a new culture, attachment's protective function will be activated when individuals are under various challenges and stress, and the instructive function of attachment will act to help them cope with the new surroundings. Securely attached immigrants have a positive self-image and they trust others; social interactions are faced with confidence. As a result they will not feel threatened by contact with other cultures (Oudenhoven & Hofstra, 2006) (protective function of attachment), and can explore their new surroundings comfortably, which may have a positive effect on their psychosocial adjustment and mental health (instructive function of attachment). On the other hand, individuals who lack a sense of secure attachment tend to remain limited in capacities that regulate their exploration of unfamiliar social surroundings (Wang & Mallinckrodt, 2006), which will hinder successful adaptation.

5.1.3 Acculturation modes

The unidimensional model and the bidimensional model are the two models that are most commonly used to examine modes of acculturation (Tsai, Yulia & Ying, 2002). According to Ryder, Alden, & Paulhus (2000), a bidimensional model is a more valid and useful operationalization of acculturation. Theorists who adopt a bidimensional perspective argue that acculturation can be more completely understood when heritage and mainstream cultural identities are seen as being relatively independent of one another (Berry, 1997). In the present study, we adopt the bidimensional model (acculturation to host culture and identification to home culture) to investigate the modes of acculturation.

Recent studies have examined Berry et al.'s (1987) two dimensions of acculturation modes (i.e., orientation toward host and home cultures) or classification of acculturation attitudes (i.e., integration, assimilation, separation, and marginalization), in conjunction with adult attachment orientations (i.e.,

avoidance and anxiety) or attachment styles (i.e., secure, dismissing, fearful, and preoccupied) (Oudenhoven & Hofstra, 2006). In the study conducted by Wang & Mallinckrodt (2006), attachment anxiety was negatively associated with students' acculturation to U.S. culture and attachment avoidance was negatively associated with identification with home culture.

Although not all change is inherently stressful, there are times and situations in which changes associated with the acculturation process can be distressing (Berry et al., 1987). A few studies have examined acculturation as a factor in psychological adjustment (Cheung- Blunden & Juang, 2008; Kwok, 2007). Acculturation and mental health are thought to have a complex relationship since acculturation in U.S. and Asian cultures showed various effects on mental health (Patel, 2008). The findings from several studies suggest that dimensions of acculturation and identification with American culture are associated with positive well-being (Yeh, 2003; Wang & Mallinckrodt, 2006). However, research on the role of identification with home culture in psychosocial adjustment has been inconsistent: Some studies have indicated a protective effect for mental health (Ward & Kennedy, 1994), while others have indicated no effects on psychosocial wellbeing (Cemalcilar, Falbo, & Stapleton, 2005; Wang & Mallinckrodt, 2006).

In light of the moderating effects posited in Berry et al. (1987)'s model and the existing literature, the effect of attachment, the modes of acculturation on general mental health as well as the interactive effect of attachment and acculturation on general mental health are examined in the present study.

5.1.4 Nature of Japanese society

To understand the acculturation process in Japan, we need to consider the nature of Japanese society. In Berry et al.'s model (1987), the nature of the larger society is one of the most important factors in the acculturation process. This moderating factor refers to the attitudes of people in the dominant culture of the host society, which can vary from high tolerance for cultural diversity to strong pressure for a single cultural standard. According to Kozakai (1996), Japanese are open to receiving information and goods from other countries, but are unwilling to accept the foreigners who bring these things to Japan. Bail (2005) argues that for many Japanese, their ethnic and national identity is defined by the idea of Japan being a homogeneous nation, in which the Japanese people are "united by blood and by a unique culture." This has resulted, until recently, in the rejection of minorities in Japan and explains why Japanese people have been resistant to changing their conceptions of citizenship and Japanese identity.

Adachi (2008) investigated the Japanese intercultural receptivity to foreigners in a local city in Japan according to the age of the subjects and the country of origin of foreigners. The results showed that older adults are less receptive to foreigners than young people, and that both older and young people

have a more positive view of American and European people than they do of Chinese or other Asian people (Adachi, 2008). This suggests that it may be difficult for Chinese to be fully accepted by Japanese society, as Bail (2005) argues with regard to Chinese and other minority groups in Japan. If individuals in the new culture are not truly accepted by the new society, they are likely to feel lonely, isolated and pessimistic about their future in that society, and become more susceptible to mental illness.

The number of foreign students in Japan has been increasing rapidly since the 1980s, and reached a peak of 141,774 students in May 2011 (Japan Student Services Organization, 2011). A large proportion of these foreign students were Chinese (86,173 students, 60.8% of the total). Despite the growing number of foreign students, Japan has not yet developed an openness toward these new arrivals (Sakanaka, 2011), and the mental health services provided for foreign students in most schools are not considered adequate (Wang & Yokoyama, 2009). Some research has focused on the mental health of foreign students in Japan and found that they had poorer mental health than Japanese students (Ma, 2007).

Therefore, research on the Chinese students' acculturation process occurring in Japanese society can extend our knowledge about acculturation, which has so far primarily focused on Western societies.

5.2 The cross-cultural comparison of Japan and China

5.2.1 The importance of comparing Japan and China

The definition of attachment in mainstream attachment research is in line with the conception of psychological autonomy, adaptive for the Western middle-class, but deviating from the cultural values of many non-Western and mainly rural ecosocial environments (Keller, 2013). To date, the vast majority of research on adult attachment orientations, working models and their derivations has been conducted primarily in Western societies (e.g., Doherty et al., 1994; Wei et al., 2007), and the only dimension that attachment researchers have recognized as cultural is the distribution of attachment styles (Keller, 2013). Although there is a consensus among researchers on the importance of culture in influencing attachment, and Keller (2013) has proposed the re-conceptualization of attachment theory as a culture- sensitive framework, little is known about the differences in attachment dynamism across Asian cultural systems, such as those in China and Japan.

Although China and Japan are geographically close and historically connected, the recent history of these two countries has caused them to diverge into two very distinct modern civilizations (Neuliep, 2008). Since the 1950s, Japan has been strongly influenced by Western culture (Neuliep, 2008) and has become a special mixture of Eastern and Western cultures. On the other hand, the Chinese family structure and function have largely changed after the one-child policy implemented in 1979. Attempts

to consider the cross-cultural effects on attachment focusing on these two Asian ethnic groups would be a beneficial supplement to the cross-cultural literature concerning comparisons among Eastern and Western cultures.

5.2.2 Comparisons between Japan and China

There are differences for many aspects between Japan and China. In the present study, the issues related to two countries' family structure and parental rearing are mainly discussed because they have close relationships with development of attachment.

In Japanese traditional families, the most important relationship in the family is the cross generational relationship between the parent and the child (Tamura, 2001). It is primarily between a mother and a child and the mother meeting the physical and psychological needs of the child. It is specially so for sons, because the first son would eventually become the head of the family for the next generation, and the aged parents had to depend on him for future care. The father-child relationship tends to be more distant, but still important for the succession of family leadership. Sons also are expected to obtain the father's occupational skill. This gender bias has resulted in significant gender inequalities in many respects, such as the social status and share of intra-household resources.

In China, parents tend to display a preference toward male children and this so-called ‘‘son preference’’ has existed among most Chinese parents for centuries. After the one-child policy, however, most families in Chinese urban areas only have one child regardless of its sex. Therefore, girls inside one-child households may enjoy better intra-household status than they would have experienced in the presence of other siblings, particularly male siblings, and thus may receive more resources for consumption, such as nutrition and opportunities for education (Lee, 2012). These one-child tend to be over-cared for by adult caregivers, especially in three-generation families. In Chinese urban areas 50-70% of young children are mainly looked after by their grandparents (Li, 2005; Lu, 2004). In these families children share a household with both their parents and grandparents (Jiang et al., 2007).

To date, few comparative studies concerning adult attachment between Japan and China have been carried out, and thus it is difficult to draw direct conclusions about the differences and/or similarities in attachment between these two cultural systems. However, according to attachment theory (Bowlby, 1982), family environment and parenting behaviors have direct impacts on the development of attachment. The differences in many aspects of parenting and family structure between Japan and China may have some influence on the nature of attachment and the relationships between attachment and other variables.

Some studies have suggested the existence of differences in parents' excessive expectations, parent-child relationships, cognitive structures in parent-child relationships, maternal rearing styles and

so on between these two quite distinct communities (Sun, 2010; Hida & Bi, 2003; Wang, 2008; Oyama & Tsujino, 2003).

For example, although both Chinese and Japanese adolescents are closer to their mothers than their fathers (Zhu, 1999; Wang, 2008), Chinese adolescents are closer to their fathers than Japanese adolescents (Hida & Bi, 2003). In China, both mothers and fathers work in many cases and they also take care of their children together, so children often look at their parents as a single unit and feel close to both their mothers and their fathers. The employment rate of mothers in the 25-34 age range that have children under the age of 6 is 72.0% (Wang, 2011). In contrast, the division of the labor between the genders was clearly defined in Japan: men to stay out of the family and to work for the family, women were expected to stay home and to do the household chores and child rearing. Fathers are supposed to work hard, staying late at night during the weekdays. Therefore, they rarely take part in rearing their children, and have weaker emotional bonds with them. On the other hand, mothers took on the major responsibility in child rearing, and maintained very close (often enmeshed) relationships with children not only in childhood years, but also in adolescents and young adults up to their twenties (Tamura, 2001).

In the cognitive structure of parent-child relationships, Japanese college students feel more positive avoidance, feeling of rejection, and psychological intrusion in their relationships with their mothers, and greater feelings of rejected and parental inconsistency with regard to child-rearing in their relationships with their fathers than the Chinese sample (Wang, 2008). With regard to parents' expectations, Chinese parents have higher expectations regarding their children's achievement than Japanese parents generally do (Sun, 2010). However, this does not mean that Japanese parents have no concern about their children's achievement. In fact, Japanese parents put greater expectations on their sons than on their daughters because the male role is given more meaning and value in the traditional social framework (Sun, 2010). This phenomenon is not obvious in modern Chinese families, because the one-child policy has resulted in most Chinese families having only one child regardless of gender since 1979.

Shinohara & Harasaki (2003) compared the differences in "amae" (a Japanese word which denotes something similar to attachment) and social adaption between young people in Japan and China, and found that Japanese adolescents had higher levels of "amae" than Chinese adolescents in all dimensions of "amae". Further, these differences in "amae" between the two groups were associated with different economic consciousness.

Furthermore, some studies have also investigated the differences in mental health between these two countries. Qi, Asakawa, Fukumoto, & Minami (2011) compared the subjective well-being of Japanese

college students and Chinese international students in Japan. They found that Chinese students have higher self-efficiency and lower positive emotional experience and lower satisfaction in life than Japanese college students. In another study, Yamada, Hiyakawa, & Minematsu (1994) compared "psychological lively activity" between university students in Japan and China. There were no differences between Japan and China in the total score for positive health, but in the subscale of positive health, the scores for "self-acceptance" and "life satisfaction" were higher in Chinese than Japanese. In the negative health scores, the scores for Japanese students were higher than those for Chinese students. Japanese students were more nervous, instable, depressive and irritative than Chinese who were more positive, confident and stable in mood.

Although direct evidences are lacking to prove the differences of attachment and its links with other variables between Japan and China, the differences of parenting rearing and family structure existing between these two countries may provide some important clues regarding the comparison of attachment and other related issues between Japanese and Chinese students.

Table 2.1 Normal personality traits and personality disorders in Millon's model

Instrumental Coping patterns	***Reinforcement Strategies***			
	independent	**dependent**	**ambivalent**	**detached**
actively initiating	forceful (antisocial)	Sociable (histrionic)	Sensitive (passive-aggressive)	Inhibited (avoidant)
passively accommodating	Confident (narcissistic)	Cooperative (dependent)	Respectful (compulsive)	Introversive (schizoid)

Note. The contents in the brackets are personality disorders corresponding to the normal personality traits.

Chapter 3: Purpose of dissertation

Although research into adult attachment has been carried out widely in Western cultures, experimental research is still not sufficient to explain the mechanism of attachment and its relationship to other variables in Eastern cultures. The main purpose of the present dissertation was to fill this gap and expand on previous research by exploring the relationship between attachment and psychological outcomes in Eastern culture (see Fig.3.1). Based on a combination of prior research results and understanding of attachment theory, this research proposed three questions about attachment to explore how attachment is associated with individuals' mental health, as follows.

1. Do attachment and personality traits share a common underlying structure, and do insecure attachment and most personality disorders share similar developmental antecedents?

2. How is attachment associated with mental health through different mediators?

3. What role does culture play in the relationship between attachment and mental health?

These questions are addressed in the next three parts, as follows.

Part II explores the relationship between attachment, personality traits and personality deviations simultaneously in order to enrich the Chinese research in this field. This part analyzes the adult attachment dimensions and styles according to personality traits and personality deviations, respectively. Part III explores the mediating effects of self-esteem and coping with stress on attachment and their relationship to general mental health and quality of life in different cultural groups. Part IV investigates the cultural roles in the relationships between attachment and general mental health. In order to do so, two studies were conducted. One study compares the relationship between attachment, coping and general mental health using Japanese and Chinese student samples. The other study explores how attachment functions in the acculturative process, by examining the relationships between attachment, acculturation, and general mental health in Chinese students in Japan.

Fig.3.1 Research Model of the Present Study

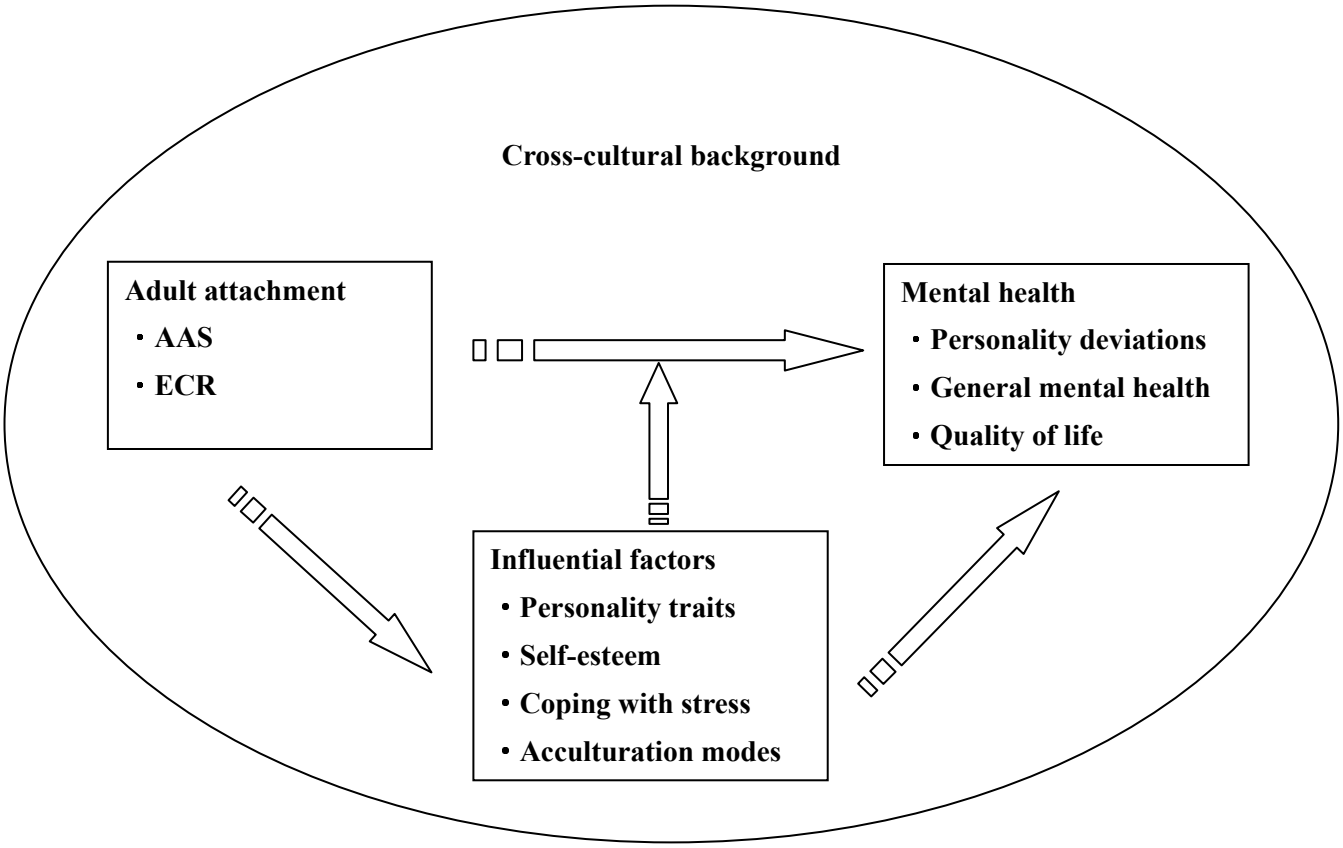


Fig.3.1 Research Model of the Present Study

Part II Attachment and Personality traits/Personality Deviations

Chapter 4: Preparative study 1 Revision of the Chinese version of the AAS

1 Purpose of study

Many western researchers have early explored the field of adult attachment, but in China few studies about adult attachment were carried out because of the lack of effective measuring instrument. The purpose of the preparative study 1 is to revise "The Adult Attachment Scale (AAS)" into Chinese and examine the psychometric properties of this instrument to assure whether it can be effectively applied to the Chinese samples.

The reason that AAS was chosen in the present study is that (1) AAS has only 18 items and so it can be used to large sample easily and conveniently; (2) AAS is constructed on the basis of underlying dimensions of attachment (i.e., Close, Depend, and Anxiety) rather than discrete attachment categories (i.e., Secure, Insecure). As argued elsewhere (Collins & Read, 1990), a measure to attachment orientations can often provide a more precise understanding of attachment processes.

2 Methods

2.1 Participants

The first-test sample consisted of 103 college students (M = 20.9 years, SD = 2.17), 30 men and 71 women. For the other 2 cases, no gender data were available. Retest Sample were comprised of 493 college students (M = 21.8 years, SD = 2.01), 229 men and 258 women. Other 6 people did not report their gender. The retest sample was collected for twice, first one was comprised of 101 students and the second part was comprised of 392 subjects.

2.2 Measures

The Adult Attachment Scale (AAS) (Collins & Read, 1990). The AAS is an 18-item self-report questionnaire developed by Collins and Read (1990), originally based on Hazan and Shaver's (1987) adult attachment descriptions. AAS has three subscales: Depend, Anxiety, and Close. Each subscale contains six items. The response format for each item is a 5-point scale anchored with the labels-fully disagree to fully agree. The three subscales have shown satisfactory internal consistency across several investigations, with the exception of Anxiety. Cronbach's alpha coefficients range from 0.68 to 0.75 for Close, 0.71 to 0.88 for Depend, and 0.52 to 0.55 for Anxiety.

For my study, the AAS was translated into Chinese and back translated into English three times to ensure translation accuracy. The translation and back-translation were conducted independently by several psychology graduate students who have been working on their PhD. in U.S. for more than two years and several graduate students working on their master degree who understand well about attachment theory. In the retest, according to (1) Collins' suggestions for amendments and supplements

(1996), (2) the results of factor analysis, item analysis and internal consistency in the first test, and (3) the report on AAS's application in China (Wu, Zhang, & Liu, 2004), I corrected the contents of 5 items of AAS. Most of them focused on the "Depend" subscale, because people who grow up under Western culture and Chinese culture have different comprehension of the term "depend" and take different attitudes toward "depend". In addition, I also modified some wording of the items to make them conform to localized adaption in China of AAS.

Somatization Scale of Chinese Personality Assessment Inventory (CPAI) (Song, Cheung & Xie, 1996). CPAI, developed by the researchers of Department Psychology at the Chinese University of Hong Kong and Institute of Psychology in the Chinese Academy of Sciences, is an indigenously developed personality measure, which covers both universal and culture-specific personality dimensions. CPAI includes 22 normal personality subscales, 12 clinical personality subscales and 3 validity subscales. Many of research have shown that insecure attachment is related to various behavior problems and psychological disorders (Wu, Zhang & Liu, 2004). For Chinese, people tend to reflect behavior and psychological problems to physical discomfort or pain firstly (Cheung, 1986). Accordingly, I chose the somatization scale of CPAI as the criterion to evaluate the criterion related validity of AAS (Song, Cheung & Xie, 1996). Somatization subscale is comprised of 15 items. The response format for each item was "yes" or "no" to agree or disagree with the content of item. At present study, this scale's internal consistency is 0.63.

2.3 Procedure

All of the data were collected by self-report questionnaires in 2004-2005. For the first test, participants were asked to complete the AAS in class without reward, and the process lasted about 5 minutes. In retest, the set of surveys were answers in the students' dorms, and gifts were given after questionnaires were finished. The time was about 15-20 minutes. All the questionnaires were returned.

3 Results

3.1 Item analysis and reliability analysis for the first test of AAS

The correlation coefficients between 18 items and their subscales of the AAS, and the discrimination indexes of items are presented in table 4.1. The correlation coefficients of all the items except for item 18 were above 0.3 and reached the level of significance ($p < 0.01$). All the discrimination indexes were above 0.3, which have reached the accepted standard in the psychological testing and assessment.

Table 4.1 Correlation coefficients and discrimination index of items

The Cronbach alphas for our translated scales in the first test were .70, .65, and .57 for close, anxiety, and depend respectively. These values demonstrated satisfactory internal consistency within the scales.

3.2 Reliability and validity analysis for the retest of AAS

The Cronbach alphas of subscales of AAS in the retest were .76, .71, and .62 for close, anxiety, and depend respectively. These values demonstrated satisfactory internal consistency within the scales.

Criterion related validity of AAS was tested by the Pearson's correlation of AAS and somatization scale. The results showed that correlation between the subscale of "depend" and somatization scale was -0.26 ($p < .05$), the subscale of "anxiety" and "close" were correlated to somatization scale with 0.58 ($p < .01$) and -0.37 ($p < .01$) respectively.

The factor structure analysis was conducted for the revised AAS, and the construct validity of the AAS was tested. Bartlett's test of sphericity was tested for the 18 items of the AAS and KMO was 0.76, which means the method of factor analysis can be adopted with the data. Principal components and varimax were selected in the process of analysis. On basis of Eigenvalues of all those factors (table 4.2) and the result of scree plot (Fig. 4.1), three factors are retained to explain 39.29% variance, which is consistent to prior study (Collins & Read, 1990). Items in the rotated matrix and their loadings in the factor are presented in table 4.3.

Table 4.2 Variance explain of factor analysis of AAS

Fig. 4.1 The scree plot in the exploratory factor analysis of the AAS

Table 4.3 Rotated component matrix of the Chinese Version of AAS

The results of factor analysis showed that most of items were in accord with the set of original subscales except for item15 and item 10, which has dual loading on factor 1, factor3, and factor2, factor3 respectively. Therefore, I named factor1 as close, factor2 as anxiety and factor3 as depend in accordance with original English version of the AAS.

The method of confirmatory factor analysis was used to analyze the structure of Chinese version of AAS with the software of Lisrel 8.20. The analysis used correlation matrix and maximum likelihood method, and the model was set completely on basis of the theoretic structure of AAS. The standard of a good fit model is (1) $\chi^2/df < 2$, (2) GFI > 0.9, (3) AGFI > 0.8, (4) RMSEA < 0.05 (MacCallum & Austin, 2000). As MacCallum & Austin's suggestion (2000), the revised Chinese version of AAS got an excellent fitting, and the results of confirmatory factor analysis supported the model structure well. The fit indexes of the model in this analysis are presented in table 4.4. The factor correlations were -0.21 ($p <.05$) for Close and Anxiety, -0.02 for Anxiety and Depend, and 0.41 ($p <.05$) for Close and Depend.

Table 4.4 Confirmatory factor analysis of the Chinese version of AAS

3.3 Test of sex differences for the AAS

Multivariate analysis of covariance was used to test whether there were significant sex differences on the subscales of the AAS. The dependent variables are three subscales of AAS, and the independent

variable is gender. The results showed that gender had significant main effect on the AAS (Pillai's Trace $F = 3.80$, $p < .01$), and this significant gender difference only existed on the anxiety subscale ($F = 9.25$, $p < .01$) after testing the gender differences for each subscales respectively. Males got higher scores than females on the anxiety subscale.

4 Discussion

From the middle of 80's, many attachment researchers convert their interests from childhood to the adolescents and adults, and more than 100 kinds of measure instruments had emerged accordingly. The pace of progress in the field of adult attachment mainly depends on whether and to which degree the instruments are effective. At present, there are few instruments measuring adult attachment in China and so few researches concerning adult attachment are carried out. Therefore, it is one extremely meaningful job to develop adult attachment instruments which are effective and applicable for the Chinese group.

In the present study, the Adult Attachment Scales (Collins & Read, 1990), extensively used in Western culture, was choose to be revised to Chinese version. The Chinese version of the AAS showed good reliability and validity after some revisions in the retest, such as adding, deleting, and rephrasing appropriately. In addition, the revised Chinese version of the AAS got lower auto-correlation than the English version. The result of cluster analysis was accordant with the English version. Sex differences were also found on the anxiety subscale of the AAS to some extent. All of these results implicated that the revised Chinese version of the AAS was satisfied and could be used to explore and study the attachment further in Chinese culture.

Table 4.1 Correlation coefficients and discrimination index of items

Item	Correlation to subscale	Discrimination index	Item	Correlation to subscale	Discrimination index
1(close)	.73**	0.85	10(anxiety)	.76**	0.52
3(close)	.48**	0.64	15(anxiety)	.39**	0.39
18(close)	.27**	0.39	12(anxiety)	.63**	0.61
11(close)	.80**	0.79	4(depend)	.42**	0.49
13(close)	.69**	0.86	8(depend)	.68**	0.58
14(close)	.74**	0.75	9(depend)	.65**	0.73
2(anxiety)	.50**	0.52	17(depend)	.53**	0.56
6(anxiety)	.67**	0.61	5(depend)	.51**	0.69
7(anxiety)	.65**	0.44	16(depend)	.64**	0.58

Table 4.2 Variance explain of factor analysis of AAS

Components	Unrotated			Rotated		
	Eigenvalue	% of Variance	Cumulative %	Eigenvalue	% of Variance	Cumulative %
1	3.93	21.84	21.84	2.76	15.31	15.31
2	2.01	11.19	33.03	2.18	12.11	27.42
3	1.76	9.77	42.80	2.14	11.87	39.29
4	1.28	7.08	49.88	1.59	8.81	48.11
5	1.11	6.18	56.06	1.43	7.95	56.06

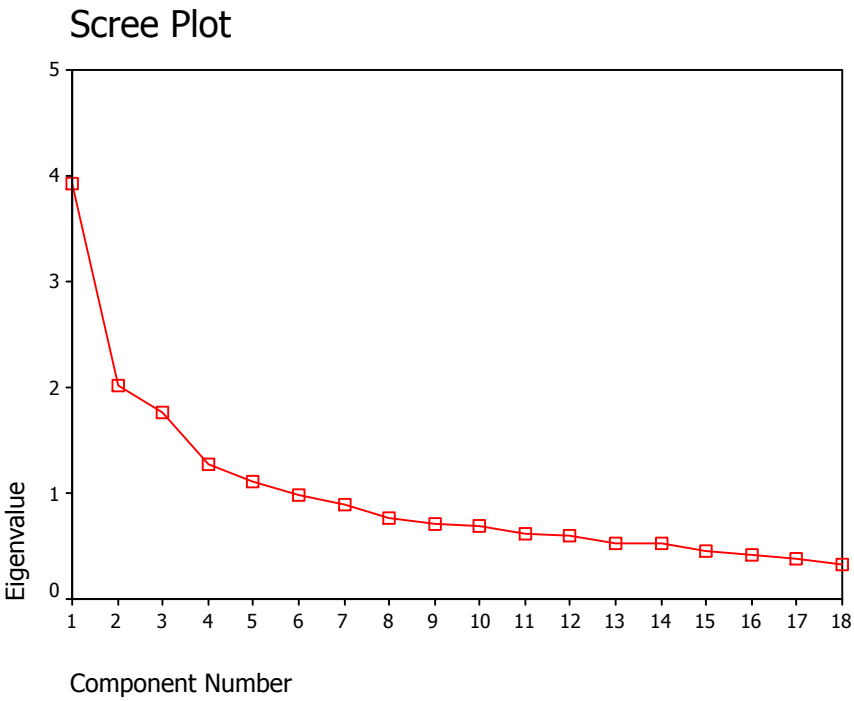


Fig. 4.1 The scree plot in the exploratory factor analysis of the AAS

Table 4.3 Rotated component matrix of the Chinese Version of AAS

Items	factor1	factor2	factor3
4. Often, love partners want me to be more intimate than I feel comfortable being.(Close)	**.78**	-.02	.02
6. I am somewhat uncomfortable being close to others. (Close)	**.73**	-.19	.19
2. I find it relatively easy to get close to others. (Close)	**.67**	.06	.17
3. I am nervous when anyone gets too close. (Close)	**.64**	**-.36**	.12
17. I do not often worry about someone getting too close to me. (Close)	**.59**	-.06	-.01
9. I am comfortable having others depend on me. (Close)	**.39**	-.27	-.01
14. I often worry my partner will not want to stay with me. (Anxiety)	.00	**.72**	.01
13. My desire to merge sometimes scares people away. (Anxiety)	.05	**.65**	.15
8. I find others are reluctant to get as close as I would like. (Anxiety)	.01	**.62**	-.08
7. I want to merge completely with another person.(Anxiety)	-.20	**.60**	-.22
5. I often worry that my partner does not really love me. (Anxiety)	-.19	**.54**	.05
11. I do not often worry about being abandoned. (Anxiety)	-.16	**.54**	-.14
16. I know that others will be there when I need them.(Depend)	.01	-.08	**.76**
18. I am not sure that I can always depend on others to be there when I need them. (Depend)	-.04	-.13	**.73**
12. I seldom feel very helpless, because I can always depend on others. (Depend)	.02	.00	**.64**
10. People are never there when you need them. (Depend)	.21	**-.36**	**.54**
15. I find it difficult to allow myself to depend on others. (Depend)	**.32**	.09	**.37**
1. I am comfortable depending on others. (Depend)	.19	.11	**.32**

Table 4.4 Confirmatory factor analysis of the Chinese version of AAS

	χ2/df	GFI	AGFI	RMSEA	NNFI	CFI
AAS	0.64	0.98	0.97	0.00	1.26	1.00

Chapter 5: Preparative study 2 Establishment of norms of PACL for the college student sample

1 Purpose of study

In the manual of the PACL, Strack analyzed the variation of different racial individuals on the subscales of PACL. He found that different racial males had significant differences on the scores of seven subscales and females had significant differences on the scores of four subscales. Therefore, Strack considered that establishment of local norms was necessary in some special situation, such as special group of nation (Strack, 1990). The purpose of preparative study 2 is to establish the norms and cutoffs of personality deviations for college students in China with Personality Adjective Check List (PACL).

PACL was first translated into Chinese by Gan, Chen & Leung (1996) and then administrated to 283 junior high school students from Beijing, China. Based on the American adult norms and cutoffs, more cases of personality deviation were observed in adolescents than in adults. The adolescent/adult differences suggest that using adult instruments and norms to assess or interpret adolescents' personality deviations may be not appropriate (Gan, Chen, & Leung, 1996).

At the present study, we used college students as the research subjects, which are between adolescents and adults, having their unique nature in contrast to other groups. This, together with the large gap between Chinese culture and Western culture, makes it necessary to reestablish the norms and cutoffs of PACL for the Chinese college students.

2 Method

2.1 Participants

The present study consisted of 805 Chinese college students (M = 21.44 years, SD = 1.77), 409 men and 379 women. For the other 17 cases, no gender data were available.

2.2 Measures

The present study was based on the Chinese version of the PACL developed by Zhang (2005). The PACL is a 153-item self-report instrument, including 8 personality subscales and one experimental subscale. The eight personality traits or types for describing an individual's personality as well as personality deviations when these types are extended to pathological extremes included forceful (antisocial), sociable (histrionic), sensitive (passive-aggressive), inhibited (avoidant), confident (narcissistic), cooperative (dependent), respectful (compulsive), and introversive (schizoid). The experimental subscale included three more severe types (schizotypal, borderline, and paranoid). Each item consisted in the questionnaire is one adjective word describing personality characteristics.

Participants were asked to check against adjectives which they thought appropriate in describing

themselves in an all-or-none way. All of the adjectives were self-descriptive. Each adjective endorsed worth one point and the sum of all the endorsed adjectives belonging to a subscale constituted the raw score for that subscale. However, some individuals tend to choose more adjectives to descriptive themselves, and others do not. This individuals' preference will confuse with the measurement of personality traits if the raw scores was not standardized. Therefore, the raw scores were transformed into T scores according to the methods provided by the manual of PACL (Strack, 1990), so that administrators can gauge the extent to which respondents deviate from a normal mean.

Zhang (2005) and Gan, Chen, & Leung (1996) studied the reliability and validity respectively for Chinese version of PACL, and the evidence demonstrated Chinese version of PACL had promising reliability, validity and other psychometric characteristics when it was used to study the groups of Chinese. This suggests that Chinese version of PACL can be used to the present study. At the present study, the internal consistency coefficients of the PACL's 9 subscales were all above 0.7.

The subscales of PACL are as follows:

Scale 1 - Introversive

Aloof, introverted, and solitary, these persons usually prefer distant or limited involvement with others and have little interest in social activities, which they find unrewarding. However, these individuals may appear unaware of, or insensitive to, the feelings and thoughts of others. These characteristics are sometimes interpreted by others as signs of indifference or rejection, but reveal a sincere difficulty in being able to sense others' moods and needs.

Scale 2 - Inhibited

As with the introversive style, the inhibited personality is marked by a tendency toward social withdrawal. However, for inhibited individuals this pattern is motivated not by disinterest, but by a fear of negative consequences. Inhibited persons tend to be sensitive to their own feelings and to those of others. They often anticipate that others will be critical or rejecting of them, and because of this they frequently seem shy or skittish in unfamiliar surroundings.

Scale 3 - Cooperative

Cooperative persons can be identified by a need for approval and affection, and by a willingness to live in accord with the desires of others. They usually adapt their behavior to the standards of others but in the process may deny their own needs. Interpersonally, these individuals are often cooperative, reliable, considerate of others, and deferential. Cooperative individuals often see themselves as being modestly endowed in terms of skills and abilities. They are often pleased when they can rely on others and may feel insecure when left on their own. Especially when faced with difficult or stressful situations, cooperative persons seek others to provide authority, leadership, and direction.

Scale 4 - Sociable

Like cooperative personalities, sociable individuals have a need for attention and approval. However, unlike cooperative persons sociable types take the initiative in assuring their reinforcements by being center-stage. They are characterized by an outgoing, talkative, and extroverted style of behavior and tend to be lively, dramatic, and colorful. These people are typically viewed by others as spontaneous, clever, enthusiastic, and vigorous. They often do well interacting with the public, may be skilled and adept at rallying or motivating others, and will usually put their best side forward even in difficult circumstances.

Scale 5 - Confident

Aloof, calm, and confident, these personalities tend to be egocentric and self-reliant. They may have a keen sense of their own importance, uniqueness, or entitlement. They can be self-centered to a fault and may become so preoccupied with themselves that they lack concern and empathy for others. They usually do not permit others to see their vulnerable side. When feeling exposed or undermined these individuals are frequently disdainful, obstructive, or vindictive. In the workplace, confident persons like to take charge in an emphatic manner, often doing so in a way that instills confidence in others.

Scale 6 - Forceful

Like confident persons, forceful individuals can be identified by an inclination to turn toward the self as the primary source of gratification. However, instead of the confident personality's internalized sense of self-importance, forceful people seem driven to prove their worthiness. They are characterized by an assertive, dominant, and tough-minded personal style. They tend to be strong-willed, ambitious, competitive, and self-determined. Forceful individuals are frequently gruff and insensitive in dealing with others. In contrast to their preferred, outwardly powerful appearance, these individuals may feel inwardly insecure and be afraid of letting down their guard.

Scale 7 - Respectful

Responsible, industrious, and respectful of authority, these individuals tend to be conforming and work hard to uphold rules and regulations. They have a need for order and are typically conventional in their interests. Indecisiveness and an inability to take charge may be evident in some of these persons due to a fear of being wrong. However, among co-workers and friends, respectful personalities are best known for being well-organized, reliable, and diligent. They have a strong sense of duty and loyalty, are cooperative in group efforts, show persistence even in difficult circumstances, and work well under supervision.

Scale 8 - Sensitive

Sensitive personalities tend to be unconventional and individualistic in their response to the world.

They march to the beat of a different drummer and are frequently unhappy with the status quo. They may be quick to challenge rules or authority deemed arbitrary and unjust. They may also harbor resentment without expressing it directly and may revert to passive-aggressive behavior to make their feelings known. To others they often appear awkward, nervous, or distracted, and seem angry or dissatisfied with themselves and others. An air of uncertainty and general dissatisfaction may reflect an underlying dependency and sense of personal inadequacy.

Scale 9 - Problem Indicator

Items for this scale were compiled from adjectives measuring the schizoid, cycloid, and paranoid personalities. While the scale does not define a personality style, high scores are indicative of personality problems and the potential for disorder. High scorers possess personality disorder traits and symptoms such as low ego-strength and affective instability. They are likely to appear anxious, dysphoric, and fearful, exhibit strong self-doubt, and express dissatisfaction with themselves and others. They may have long-standing adjustment problems in major areas of life such as work, school, and relationships.

2.3 Procedure

All of the data were collected by self-report questionnaires in 2004-2005. For one part of the sample, participants were asked to complete the PACL in class without reward, and the process lasted about 20 minutes. For another part of the sample, the set of surveys were answered in the dorms and some gifts were given after questionnaires were finished. The time was about 25-30 minutes. All the forms were returned.

3 Results

3.1 Transformation of T-scores

A large of researches proved that gender had great influence on the score of subscales of the PACL, and therefore the T scores are calculated for males and females respectively.

To transform the raw scores into T-scores, it is necessary to divide the sample into five groups. The standard of grouping is to make the number of subjects in each group accord with a rough normal distribution, namely the number of subjects in each group reach 10%、20%、40%、20%、10% respectively. Next, five groups are divided for both males and females according to the subjects' total number of item endorsements among the 153 adjectives. The result of grouping is presented in table 5.1. The mean and standard deviations of raw scores of 9 subscales of the PACL for the five groups by gender are presented in table 5.2.

Table 5.1 Five different groups divided for males and females

Table 5.2 Mean and standard deviations of raw scores of subscales for the five groups by gender

The raw scores were then transformed into standard scores by considering the total number of endorsements by the group in each scale, and the formulation to calculate the T-scores is as follows:

Z = (Raw Score - Mean of each group)/SD; T = 10*Z +50.

For example, one male of respondents selected 45 adjectives to describe his personality traits. According to table 5.1, he should belong to the group III for male. If there are 5 adjectives belonging to the subscale of introversive in the 45 adjectives, the T-score will equal 54.57 (T = 10* (5 - 3.79)/2.65+50).

3.2 Cutoffs of personality deviation for PACL

Most of researches of personality disorders in China are based on the standard of norms' setup of Personality Diagnostic Questionnaire-Revised (PDQ-R) (Hyler, Skodol, Oldham, Kellman, & Doidge, 1992). The standard of cutoff points for slight personality deviation is $\bar{x}+s$, and the cutoff points for severe personality deviation is $\bar{x}+2s$ (Zhu & Liu, 2003). According to general statistical principles, the present study adopts twice standard deviation as the cutoff point of personality deviation.

The means and standard deviations of T scores for 9 subscales, calculated with male and female groups together, as well as the cutoffs and the numbers of subjects beyond cutoffs, are presented in table 5.3. There were 75 subjects whose scores exceeded one of the cutoffs of 9 subscales. In addition, I analyzed the comorbidities of 9 subscales and found that there were 15 subjects whose scores were above cutoffs on two subscales and there were 6 subjects whose scores were above cutoffs on three subscales. The results are presented in table 5.4. In sum, the numbers of subjects whose scores exceed at least one cutoff of the 9 scales sum up to 96, accounting for 11.29% of total numbers (805).

Table 5.3 Mean and standard deviations of T-scores and the cutoffs of personality deviation for total sample

Table 5.4 Comorbidities distribution of the subscales of PACL

4 Discussion

PACL is developed on the basis of Millon's theory (1986) and this theory has a great influence and wide spread in the field of personality disorder. As the interpretation in the Millon's theory, personality is one continuum, and high scores on the subscales only mean the orientation of personality disorders. Whether on earth one has personality disorder must be proved with other information and further diagnosis (Strack, 1990). Accordingly, in the present study, we try to establish the norms of personality deviations, not personality disorders, and the norms are only used to explore the relationship between personality and other variables as an investigating tool, not to be one diagnostic tool.

The number of subjects whose scores were above cutoffs on the subscale of passive-aggressive, schizoid, antisocial is fewer than 20. The number of compulsive personality deviation is fewest, only 7

persons. These are different from the results of the Zhu's investigation of freshmen, in which the rate of schizoid personality deviation is highest (23.1%), secondly the rate of histrionic is 21.1%, and the rate of avoidant is lowest (11.5%). In general, the number of individuals with personality deviations sums up to 96, accounting for 11.93% of total numbers. Because the strict cutoff points for severe personality deviation ($\bar{x}+2s$) are adopted in the present study, the number of individuals with personality deviations is a little lower than the results in other studies.

Table 5.1 Five different groups divided for males and females

	Male		Female	
Group	Number of adjectives	Number of participants	Number of adjectives	Number of participants
I	0-16	42	0-20	39
II	17-27	81	21-31	77
III	28-46	169	32-49	153
IV	47-62	79	50-61	75
V	63-153	38	62-153	35

Table 5.2 Mean and standard deviations of raw scores of subscales for the five groups by gender

subscale		I		II		III		IV		V	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
introversive	Mean	1.49	1.15	2.13	2.36	3.79	3.95	4.99	4.91	8.82	7.49
	SD	1.54	1.04	1.64	1.61	2.65	2.39	2.89	2.71	3.46	3.97
inhibited	Mean	1.73	2.21	3.44	4.08	5.76	6.41	8.34	9.57	13.53	13.46
	SD	1.78	1.81	2.47	2.94	4.02	4.00	4.84	4.89	5.67	6.27
cooperative	Mean	2.95	5.54	6.00	7.05	9.40	12.80	13.33	14.71	15.03	17.83
	SD	1.80	2.62	2.70	3.01	3.61	3.91	3.87	5.03	4.28	3.31
sociable	Mean	1.29	2.46	2.51	4.05	4.49	5.07	7.34	7.20	9.39	9.69
	SD	1.62	2.46	2.58	3.68	3.78	3.74	4.79	4.56	5.52	5.14
confident	Mean	1.17	1.49	2.26	2.86	4.06	4.05	6.81	5.68	10.39	9.11
	SD	1.22	1.39	1.70	1.88	2.37	2.19	2.97	2.71	4.43	4.06
forceful	Mean	1.22	1.03	2.48	2.73	4.60	3.42	7.58	5.89	11.45	9.63
	SD	1.48	1.16	1.93	2.26	3.13	2.42	3.79	3.34	4.94	5.07
respectful	Mean	2.17	2.92	5.06	5.57	7.71	9.20	11.30	10.80	12.87	12.97
	SD	1.87	1.82	2.71	3.23	3.60	3.64	3.81	4.19	3.95	4.13
sensitive	Mean	1.22	2.18	3.00	4.17	5.18	5.43	7.61	9.41	13.24	13.11
	SD	1.26	2.36	2.25	2.96	3.37	3.19	4.44	4.77	5.41	4.58
PI	Mean	0.73	0.26	0.89	0.73	1.74	1.37	2.81	2.96	5.47	4.57
	SD	1.00	0.59	1.11	1.18	1.93	1.75	2.42	2.46	2.64	2.50

Table 5.3 Mean and standard deviations of T-scores and the cutoffs of personality deviation for total sample

Subscale	Mean	SD	Cutoff	Number above cutoff
introversive (schizoid)	48.82	12.42	73.66	16
inhibited (avoidant)	48.88	12.30	73.48	12
cooperative (dependent)	48.88	12.30	73.48	9
sociable (histrionic)	48.82	12.42	73.66	11
confident (narcissistic)	48.75	12.53	73.82	15
forceful (antisocial)	48.75	12.53	73.81	16
respectful (compulsive)	48.76	12.53	73.83	7
sensitive (passive-aggressive)	48.82	12.42	73.66	17
Problem indicator	48.88	12.30	73.49	20

Note: Because the mean and SD in table 5.2 is rounded off to the second decimal place, small errors existed in the following calculation of T scores, which may affect on the values of mean and SD of T-scores.

Table 5.4 Comorbidities distribution of the subscales of PACL

	subscale	number	subscale	Number
Comorbidities on two subscales	Sensitive, PI	3	Confident, Forceful	3
	Inhibited, PI	1	Sociable, Confident	2
	Introversive, PI	1	Inhibited, Cooperative	1
	Introversive, Sensitive	1	Inhibited, Sensitive	1
	Cooperative, respectful	1	Inhibited, Confident	1
Comorbidities on three subscales	Inhibited, Sensitive, PI	5	Introversive, Inhibited, PI	1

Chapter 6: Study 1 Attachment and its relationship to personality traits and personality deviations

1 Purpose of study

By now, some studies have explored the relationships between attachment and personality traits (e.g., Bakker, Pieter, & Karen, 2004; Bartholomew & Horowitz, 1991; Noftle & Shaver, 2006) or attachment and personality disorders (e.g., Meyer, Pilkonis, & Beevers, 2004; Sheldon & West, 1990; Williams & Schill, 1994). However, according to Millon's model (1986), normal personality is supposed to be on a continuum with pathological personality, and more research should address the interface between normal and abnormal personality.

Therefore, the present study is to explore the relationships between adult attachment and personality traits, personality deviations by using Strack's "Personality Adjective Check List" (PACL) (1990), which simultaneously measures both personality traits and personality deviations.

Previous research has shown secure attachment was positively association with positive personality traits (e.g., Bakker, Pieter, & Karen, 2004; Carver, 1997), insecure attachment was positively association with negative personality traits (e.g., Carver, 1997; Noftle & Shaver, 2006), and most of personality disorders (e.g., Meyer, Pilkonis, & Beevers, 2004). On the basis of attachment theory's relevance for the study of personality and personality disorders, the following hypotheses are generated.

Hypothesis1: There is a significant positive correlation between "anxiety" dimension of AAS and maladaptive personality pattern; there is a significant positive correlation between "close", "depend" dimensions of AAS and adaptive personality pattern.

Hypothesis2: Individuals with secure attachment style tend to have positive personality traits; individuals with insecure attachment style may have more negative personality traits.

Hypothesis3: There are significant differences on "close", "depend" and "anxiety" dimensions of AAS between the individuals with personality deviations and the normal individuals. The individuals with personality deviations get lower scores on the "close" and "depend" dimensions than normal individuals and higher scores on the "anxiety" dimension than normal individuals.

2 Method

2.1 Participants

The present study consisted of 392 college students, 191 men and 201 women. Their age ranged from 16 to 32 (M = 21.78 years, SD = 1.96). The sample is the same to the second part of retest sample in preparative study 1.

2.2 Measures

The Revised Chinese Version of the AAS The revised Chinese version of the AAS in the preparative study1 is used in the present study. The three subscales have shown satisfactory internal consistency, with the Cronbach's alpha coefficients 0.620 for depend, 0.707 for anxiety and 0.755 for close.

The Chinese Version of the PACL In the present study, I adopt the revised Chinese version of the PACL (Zhang, 2005) used in the preparative study2. In the present study, the Cronbach's alpha coefficients of 9 subscales of the PACL are from .73 to .86.

2.3 Procedure

All of the data were collected by self-report questionnaires in 2004-2005. The AAS and the PACL were answered in the dorms and some gifts were given after questionnaires were finished. The time was about 25-30 minutes. All of the questionnaires were returned.

3 Results

3.1 T-scores for the PACL

The method of calculating T-scores of the PACL is the same to what was used in the preparative study2. First, five groups were divided for both males and females according to the subjects' total number of endorsed adjectives. Next, means and standard deviations of the raw scores of the PACL subscales were calculated. The results were presented in table 6.1. Finally, T-scores were calculated with the transforming formulation.

Table 6.1 Mean and standard deviations of the raw scores of subscales for five groups by gender

3.2 Factor analysis for the subscales of the PACL

The correlations among the 9 subscales of the PACL were calculated and high correlations between the subscales were found (see table 6.2). Because of high self-correlations between the subscales of the PACL, it is necessary to analyze the 9 subscales of the PACL with factor analysis firstly.

Table 6.2 Correlations between the 9 subscales of the PACL

Bartlett's test of sphericity was tested for the 9 subscales of the PACL and KMO was 0.69, which means the method of factor analysis can be adopted. Principal components and varimax were selected in the analysis. On basis of the results of Eigenvalues and scree plot, three factors were extracted, which explained 77.86% variance. Items in the rotated matrix and their loadings in the factor were presented in table 6.3.

Table 6.3 The loadings of subscales of PACL on the extracted factors

The structure resulting from the factor analysis of the PACL is very clear, and the loadings of the subscales of PACL are all above .70. Moreover, there are no dual loadings of any subscale. According to the meaning of the subscales, factor 1 is named as nervosity, factor 2 is named as extroversion, and

factor 3 is named as agreeableness.

3.3 Attachment dimensions and personality traits

The canonical correlation analysis was performed to analyze the correlations between two groups of variables: attachment dimensions and three factors of the subscales of PACL obtained from the factor analysis. With consideration of the gender difference of the scores on the AAS, the canonical correlation analysis was conducted with males and females respectively, and the results are presented in table 6.4, table 6.5, and table 6.6.

Table 6.4 Canonical correlations between AAS and PACL

Table 6.5 Canonical loadings of extracted factors of PACL and subscales of AAS

Table 6.6 Redundency analysis of canonical variates between AAS and PACL

Canonical loading coefficients were presented in table 6.5, which are meaningful only when they are larger than 0.3. One significant canonical variate between AAS and PACL was obtained from the analysis for the male group and the canonical correlation was 0.48. This variate showed high nervosity, low extroversion and agreeableness were correlated to high anxiety, low depend and close. We named the group of personality traits (high nervosity, low extroversion and agreeableness) as maladaptive personality pattern and named the group of attachment dimensions (high anxiety, low depend and close) as anxious attachment pattern. Therefore, this variate means there is significant correlation between maladaptive personality pattern and anxious attachment pattern for the male group.

For the female group, two significant canonical variates between AAS and PACL were obtained. The first one showed low nervosity, high extroversion and agreeableness were correlated to low anxiety, high depend and close, and the canonical correlation was 0.37. We named the group of personality traits (low nervosity, high extroversion and agreeableness) as adaptive personality pattern and named the group of attachment dimensions (low anxiety, high depend and close) as secure attachment pattern. Therefore, the first variate for the female group means there is significant correlation between adaptive personality patterns and secure attachment pattern. The second variate showed low extroversion and high agreeableness were correlated to high close, and the canonical correlation was 0.25. We named the group of personality traits (low extroversion and high agreeableness) as submissive personality pattern. Therefore, the second variate for the female group means there is significant correlation between submissive personality pattern and close attachment.

3.4 Attachment styles and personality traits

AAS is an instrument focusing primarily on the continuous dimensions of the attachment, not to measure the styles of the attachment. However, we can get the information about attachment styles through transforming the subscales' scores of AAS by cluster analysis. After cluster analysis, three

attachment styles (secure, avoidant and anxious) were gotten, which were similar to the classification of attachment in other researches which mainly focus on the attachment styles. At the same time, analysis of variance showed that all of the three attachment styles had significant difference on the three cluster variables (close, depend and anxiety) ($p < 0.01$), and the results were presented in table 6.7.

Table 6.7 Cluster Analysis for the subscales of the AAS

Next, Multivartiate analysis of variance was used to analyze the personality traits with attachment styles and the result of the analysis was that Wilks' Lambda = 0.86, $F_{(18,764)} = 3.25$, $p < .01$. Post Hoc test's results were presented in table 6.8. From table 6.8, the individuals with different attachment styles had significantly different scores on the subscales of introversive, inhibited, cooperative, sociable, sensitive, and PI. Specifically, the individuals with secure attachment style got low scores on the subscales of introversive, inhibited, sensitive and PI, and had higher scores on the subscales of cooperative, sociable. The individuals with anxious or avoidant attachment style, that is insecure attachment styles, got high scores on the subscales of introversive, inhibited, sensitive and PI and had low scores on the subscales of cooperative, sociable.

Table 6.8 MANOVA results of personality traits by attachment styles

3.5 Relationships between AAS and personality deviations

The cutoffs of personality deviations calculated in preparative study 2 were used in the present study. The individuals whose T scores were above the cutoffs were screened. The result showed that the numbers of individuals whose T scores were above the cutoffs were from 2 to 12 for different subscales (table 6.9). The number of the individuals whose T scores were above the cutoff of at least one subscale of the PACL was 34, accounting for 8.5 percent of the total number.

Table 6.9 Numbers of the screened individuals with personality deviations

Multivariate analysis of variance was used to test whether there are significant differences of attachment dimensions between normal sample and individuals with personality deviations for 9 subscales respectively. The significant difference of attachment dimensions between the two groups was only found in the PI subscale, and the result of multivariate analysis of variance was Wilks' Lambda = 0.97，$F_{(3, 389)} = 4.71$, $p < .01$. After the Post Hoc test, significant differences were found on the dimensions of anxious ($F_{(1, 391)} = 7.31$, $p < .01$) and close ($F_{(1, 391)} = 10.95$, $p < .01$) between normal sample and individuals of personality deviations, and no significant difference was found on the dimension of depend. The individuals with high scores in PI had higher scores on the dimension of anxious and lower scores on the dimension of close.

4 Discussion

4.1 Attachment and personality traits

The findings in the present study almost accord with previous studies and support all of the hypotheses.

Firstly, there is a significant positive correlation between “close”, “depend” dimensions of AAS and adaptive personality pattern; there is a significant positive correlation between “anxiety” dimension of AAS and maladaptive personality pattern. The present study’s results are almost consistent with Villanueva’s (2012) research, although the Big Five was measured in the research.

Specifically, high nervosity, low extroversion and agreeableness are correlated to high anxiety, low depend and close for the male group. In these cases, insecure attachment may derive chiefly from one state, in which children are always afraid of be abandoned from early childhood. This may result from the caregivers not responding to the children’s need in time, or refusing the children’s needs without any explanation. All of these unstable or insecure parenting behaviors often make the children feel anxious. As a consequence, these children will develop nervous disposition, such as introversive, sensitive, and anxious.

One of the results for the female group is that low nervosity, high extroversion and agreeableness are correlated to low anxiety, high depend and close. This indicates that one female with adaptive personality pattern tend to have high close and depend of attachment dimensions, which greatly accords with many researches. For example, Shaver & Brennan (1992) found the correlation between secure attachment and high agreeableness, high extroversion and low nervosity. Another result of the present study is that low extroversion and high agreeableness are correlated to high close. This finding implicates some special meaning in Chinese culture. In Chinese historical and cultural traditions, one female is often expected to be amiable, submissive, demure, and reserved. People prefer to have contacts with this kind of female. Generally, the girls’ dispositions tend to be more gentle, submissive and silent because these personality traits are welcome in this culture and society. In addition, one caregiver will feel easier and more comfortable when she (he) takes care of one child with these personality traits. As a consequence, it’s easier for the caregivers and children to build close attachment with more care and attention.

Secondly, analysis of attachment styles and personality traits supported hypothesis2: individuals with secure attachment style have more positive personality traits; individuals with insecure attachment styles tend to show more negative personality traits. Specifically, the individuals with secure attachment style are more social and cooperative, and seldom display the personality traits of introversive, inhibited and sensitive. Moreover, they hardly show clinical symptoms of personality deviations. The individuals with anxious attachment style often display more introversive and sensitive,

but not social and cooperative. At the same time, they may display more clinical symptoms of personality deviations. The individuals with avoidant attachment style are more introversive, inhibited, and sensitive, and seldom display the personality trait of social. They may display more clinical symptoms of personality deviations.

4.2 Attachment and personality deviations

We have to face one large problem when analyzing the relationship of the AAS and the personality deviations. That is, the number of screened subjects with personality deviations is so few that the applications of statistical methods are greatly limited. In the present study, the hypothesis3 is partly supported: anxious and close dimensions of the AAS have significant differences of between normal individuals and individuals with personality deviations on the subscale of PI, which testing serious personality deviations (schizotypal, borderline and paranoid). That means the individuals with severe personality deviations often display higher anxiety and lower close.

Because the limitation in applications of statistical methods, we can also not explain whether the relationships between attachment and personality traits correspond to the links between attachment and personality deviations. In future study, we can further explore the interface between personality and personality disorders which was not sufficiently discussed in the present study.

Table 6.1 Mean and standard deviations of the raw scores of subscales for five groups by gender

subscale		I		II		III		IV		V	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
introversive	Mean	1.47	1.45	2.20	2.27	4.32	3.69	5.03	5.23	8.05	8.21
	SD	1.43	1.50	1.65	2.10	2.88	2.17	2.88	2.87	3.41	4.13
inhibited	Mean	2.53	2.45	4.00	3.95	6.57	6.05	8.00	9.51	12.79	15.58
	SD	2.29	1.77	2.75	2.28	4.51	3.76	5.08	4.39	5.89	5.86
cooperative	Mean	3.26	5.14	6.05	7.71	10.50	12.93	13.26	14.28	15.84	17.84
	SD	2.08	2.34	3.27	3.68	3.81	3.31	3.57	5.27	4.00	3.59
sociable	Mean	1.53	2.82	3.25	4.46	4.25	5.36	7.00	6.69	9.16	8.32
	SD	2.01	2.82	2.85	3.57	4.00	3.74	4.54	4.30	5.63	5.24
confident	Mean	1.11	1.73	3.00	3.32	4.31	4.17	6.79	6.15	10.00	8.42
	SD	1.24	1.64	1.91	1.94	2.34	2.28	2.85	2.87	4.53	3.99
forceful	Mean	0.95	1.18	3.25	2.93	4.64	3.51	8.13	6.51	10.21	9.00
	SD	1.51	1.14	2.97	2.67	3.26	2.40	3.99	3.70	5.07	5.60
respectful	Mean	2.37	3.64	5.43	5.22	8.26	9.27	12.18	10.56	12.16	12.89
	SD	1.98	2.48	2.71	3.06	3.78	3.61	3.48	4.15	3.93	4.05
sensitive	Mean	1.84	2.14	3.73	4.46	5.53	5.46	7.28	9.59	12.89	14.32
	SD	1.39	1.73	2.22	3.23	3.62	3.34	4.41	4.78	5.63	3.46
PI	Mean	1.11	0.14	1.05	0.76	1.90	1.43	2.67	2.97	5.26	5.37
	SD	1.20	0.35	1.26	1.04	2.18	1.86	2.55	2.45	2.81	2.27

Table 6.2 Correlations between the 9 subscales of the PACL

	1	2	3	4	5	6	7	8
1.introversive								
2.inhibited	.63**							
3.cooperative	.24**	.40**						
4.sociable	-.09	-.09	.28**					
5.confident	.15**	.07	.12*	.64**				
6.forceful	.18**	.03	.04	.58**	.69**			
7.respectful	.28**	.17**	.56**	.25**	.21**	.26**		
8.sensitive	.41**	.73**	.12*	.12*	.28**	.34**	.05	
9.PI	.57**	.75**	.15**	.02	.17**	.20**	.05	.78**

Table 6.3 The loadings of subscales of PACL on the extracted factors

	factor1	factor2	factor3
PI	**.91**	.15	.04
inhibited	**.90**	-.03	.29
sensitive	**.86**	.28	-.01
introversive	**.72**	.04	.28
confident	.14	**.88**	.10
forceful	.21	**.87**	.08
sociable	-.03	**.83**	.29
cooperative	.27	.11	**.87**
respectful	.10	.28	**.84**

Table 6.4 Canonical correlations between AAS and PACL

	Male			Female		
	Canon Cor.	Sq. Cor	F	Canon Cor.	Sq. Cor	F
1st canonical variate	0.48	0.23	6.15***	0.37	0.14	4.95***
2nd canonical variate	0.15	0.02	1.30	0.25	0.06	3.55**

Table 6.5 Canonical loadings of extracted factors of PACL and subscales of AAS

	Male	Female	
	1st Can. Var.	1st Can. Var.	2nd Can. Var.
Nervosity	0.89	-0.95	0.22
Extroversion	-0.47	0.51	-0.39
Agreeableness	-0.55	0.45	0.73
Depend	-0.57	0.70	0.26
Anxiety	0.52	-0.88	0.30
Close	-0.90	0.52	0.80

Table 6.6 Redundency analysis of canonical variates between AAS and PACL

	Male		Female	
	Var DE	Var CO	Var DE	Var CO
1st canonical variate	43.60	9.93	45.63	6.30
2nd canonical variate			24.56	1.54

Table 6.7 Cluster Analysis for the subscales of the AAS

Subscale	Cluster			$F_{(2, 390)}$
	1（Secure） N=156	2（Avoidant） N=128	3（Anxious） N=108	
Close	23.40	15.54	19.58	264.25**
Depend	19.21	15.85	15.46	50.181**
Anxiety	12.11	14.96	19.98	235.503**

Table 6.8 MANOVA results of personality traits by attachment styles

Personality traits	F	Secure		Anxious		Avoidant	
		Mean	SD	Mean	SD	Mean	SD
introversive	8.74**	46.19	11.28	51.68	11.85	50.42	11.90
inhibited	7.18**	46.69	11.31	49.62	11.26	52.13	12.40
cooperative	4.99**	50.85	12.08	46.52	11.25	49.64	11.73
sociable	9.38**	52.12	12.79	47.84	10.99	46.20	10.48
confident	1.62	50.19	12.44	49.21	11.75	47.52	11.11
forceful	1.64	49.96	11.93	49.33	11.91	47.34	11.32
respectful	2.57	50.67	12.54	47.52	11.54	48.81	11.01
sensitive	3.38*	47.19	11.27	50.21	11.88	50.48	12.32
PI	5.75**	46.62	10.57	50.60	12.49	50.79	12.10

Table 6.9 Numbers of the screened individuals with personality deviations

Subscale	cutoffs	Numbers above cutoffs	Numbers below cutoffs
introversive (schizoid)	73.66	10	382
inhibited (avoidant)	73.48	7	385
cooperative (dependent)	73.48	2	390
sociable (histrionic)	73.66	3	389
confident (narcissistic)	73.82	8	384
forceful (antisocial)	73.81	10	382
respectful (compulsive)	73.83	2	390
sensitive (passive-aggressive)	73.66	5	387
Problem indicator	73.49	12	380

Part III Attachment and Mental Health: Effects of Different Mediators

Chapter 7: Study 2 Relationships between attachment, self-esteem and GHQ-20 in Chinese students

1 Purpose of study

As a self-judgments of personal worth and global feelings of competence and self-acceptance (Rosenberg, 1965), self-esteem has a close connection with attachment naturally. According to attachment theory (Bowlby, 1969/1982), individuals with insecure attachment often do not belief himself or herself to be worthy or accepted. This may lead to low level of self-esteem, which in turn influences the way seeing the world and interpreting each situation negatively, and tends to associate with negative psychological outcomes (Roberts, Gotlib & Kassel, 1996).

Although the obvious correlations between attachment, self-esteem, and mental health, little is known about the links between them, especially for the Chinese populations. The purpose of study 2 is to explore the relationships between attachment, self-esteem, and GHQ-20 in a sample of Chinese college students.

In the present study, both ECRS and AAS were used to measure attachment dimensions. AAS was early introduced into China by Chinese researchers and it was chosen to measure attachment dimensions in the study 1. Although Sperling, Foelsch, and Grace (1996) found the AAS have good convergent validity with other adult attachment measures, I found some problems in Depend dimension of AAS in the process of revising the original version to Chinese version. Therefore, in the present study, I selected another attachment instrument (ECRS) to measure attachment, which has been proved to be universal across culture. In addition, AAS was also measured in the present study to confirm whether it was congruent with other attachment instruments and help to further understand the underlying structure of attachment.

Past research has found individuals with insecure attachment show lower level of self-esteem (e.g., Roberts, Gotlib & Kassel, 1996), and low self-esteem decreases mental health (e.g., Dekovic, 1999). According to attachment theory and the results of previous research, we hypothesized that high attachment avoidance and high attachment anxiety of ECRS, along with low self-esteem predict a) low sense of adequacy, b) high depression and c) high anxiety of GHQ-20; and high Close, high Depend, and low Anxiety of AAS, along with high self-esteem predict a) high sense of adequacy, b) low depression and c) low anxiety of GHQ-20.

2 Method

2.1 Participants

In this study, participants consisted of 202 college students from one university in Beijing. There

were 57 men and 131 women, and 14 students did not give their sex. Their ages ranged from 17 to 31 （M = 22.01, SD = 2.51).

2.2 Measures

Experiences in Close Relationships Scale (ECRS); (Brennan, Clark, & Shaver, 1998). ECRS was administered in order to assess the participants' attachment orientations. It included two subscales, each comprising 18 items designed to measure attachment anxiety and attachment avoidance. The participants were asked to respond to each item on the basis of a 7-point Likert scale (1 = disagree strongly, 4 = neutral/mixed, 7 = agree strongly). High scores in each subscale indicated higher levels of attachment anxiety or attachment avoidance. Brennan et al. (1998) reported an alpha coefficient of .94 for the avoidance subscale and .91 for the anxiety subscale. In the present study, a Chinese version (Li & Kato, 2006) of ECRS was used. The alpha coefficient was 0.76 for the avoidance subscale, and 0.86 for the anxiety subscale.

Adult Attachment Scale (AAS); (Collins & Read, 1990). The Chinese version of AAS, which was revised in preparative study 1, was also used in the present study. The internal reliability (alpha coefficient) was 0.72 for close, .77 for anxiety, and 0.55 for depend of AAS.

General Health Questionnaire (GHQ); (Goldberg & Hillier, 1979). The GHQ was developed to assess the extent of psychiatric illness in general practice. The original 60-item GHQ has produced several other versions such as GHQ-30, GHQ-28, and GHQ-12. In the present study, the Chinese version of GHQ-20 (Li & Mei, 2002) was used, which was scored using "yes" or "no" (yes = 1, no = 0). GHQ-20 was developed on the basis of the Chinese version of GHQ-30 through investigating 1142 Chinese college students. GHQ-20 consists of three subscales: sense of adequacy, depression, and anxiety. In the present study, the internal reliability (alpha coefficient) of GHQ-20 was .68 for sense of adequacy, .67 for depression, and .74 for anxiety.

Self-Esteem Scale (SES); (Rosenberg, 1965). SES was developed originally to test the general sense of self-valued and self-accepted experiences of adolescents. It includes 10 items, which are answered on the basis of a 4-point Likert scale (1 = disagree totally, 4 = neutral/mixed, 4 = agree totally). A high score indicates a high level of self-esteem. In the present study, the internal reliability (alpha coefficient) of SES was .76.

2.3 Procedure

All of the data were collected using self-report questionnaires in 2011. A collaborator distributed a set of survey packets to college students and collected the surveys a week later when gifts were given. The questionnaire took about 25 minutes to complete. All the questionnaires were returned.

3 Results

Data-cleaning procedures were conducted before the preliminary analyses. Two responses were discarded from the analyses because the items were not adequately answered. Because gender differences on AAS's subscales were found in preparative study1, the present study examined gender differences for the subscales of ECRS, AAS, GHQ-20, and SES by a one-way analysis of variance (ANOVA). None of the variables showed significant gender differences, and thus subsequent analyses were collapsed across gender. The means and standard deviations of ECRS, AAS, SES, and GHQ-20, and the Pearson correlation coefficients among them were assessed for the overall sample and the results were shown in table 7.1.

Table 7.1 Means, Standard Deviations and Correlations among ECRS, AAS, SES, and GHQ-20

Attachment anxiety of ECRS has a significantly positive correlation with the Anxiety of AAS, but no significant correlation with the other two subscales of AAS. In contrast to this, attachment avoidance of ECRS has a significantly positive correlation with the Anxiety subscale of AAS, and a significantly negative correlation with the Close and Depend subscales of AAS.

In order to test the mediating effect of self-esteem, four conditions have to be tested (Baron & Kenny, 1986): a. the predictor should be related to the dependent variable; b. the predictor should be related to the mediator; c. the mediator should be related to the dependent variable when controlling for the predictor; d. the effect of the predictor (β) on the dependent variable should diminish when the effect of the mediator is controlled. When the effect of the predictor is reduced to non-significance, especially nearly to 0, it is referred to as complete mediation. When its effect is still significant but reduced, it is referred to as partial mediation.

Following these recommendations of Baron and Kenny (1986), hierarchical multiple regression (HMR) analyses for three subscales of GHQ-20 were conducted. First, attachment orientations of ECRS were entered as a block into the model. Next, self-esteem was entered as the second block. The dependent variables were GHQ-adequacy, GHQ-depression, and GHQ-anxiety, respectively. The same steps and measure method were used when the predictors were AAS and self-esteem. The results of the HMR analyses of the GHQ-20 are shown in table 7.2 to table 7.6.

When using attachment orientations of ECRS and self-esteem as predictors, the results in table 7.2 indicate that attachment avoidance and anxiety collectively accounted for 9%, 10%, and 8% of the variance in the three subscales of GHQ-20 respectively. The subsequent entry of self-esteem significantly enhanced the prediction of the three subscales of GHQ-20 by explaining an additional 12%, 18%, and 13% of the variance. Moreover, the attachment orientations of ECRS and self-esteem predicted the three subscales of GHQ-20 respectively in expected directions. After entry of self-esteem, the significance of attachment avoidance and anxiety's predictive effect became smaller, even nearly to

0. Sobel test verified the significant mediation effects of self-esteem between attachment avoidance and anxiety and the three subscales of GHQ-20, and the results were shown in table 7.4.

Table 7.2 Model Summary of Multiple Regression Analyses of GHQ-20 by ECRS and SES

Table 7.3 Coefficients of Multiple Regression Analyses of GHQ-20 by ECRS and SES

Table 7.4 Sobel's test of mediation of self-esteem between ECRS and GHQ-20

On the other hand, with the predictors of AAS and self-esteem, the results in table 7.5 indicate that the three subscales of AAS collectively accounted for 9%, 12%, and 7% of the variance in the three subscales of GHQ-20 respectively. The subsequent entry of self-esteem significantly enhanced the prediction of the three subscales of GHQ-20 by explaining an additional 15%, 19 %, and 15% of the variance. The results in table 7.6 indicate that AAS-close and AAS-depend positively and significantly predicted the GHQ-adequacy. After the Sobel's test, the significant mediation of self-esteem between AAS-close and GHQ-adequacy was confirmed ($Z = 3.26$, $p < .05$), but not between AAS-depend and GHQ-adequacy ($Z = 1.85$, $p > .05$). In regard to GHQ-depression, AAS-close had a negatively predictive effect with borderline statistical significance ($p < .06$), and AAS-anxiety had a positively and significantly predictive effect. After entry of self-esteem, AAS-close's predictive effect became nearly 0 and AAS-anxiety became smaller. Sobel's test showed a significant mediation of self-esteem between AAS-anxiety and GHQ-depression ($Z = 3.82$, $p < .05$), and between AAS-close and GHQ-depression ($Z = -3.39$, $p < .05$). Finally, a mediation of self-esteem between AAS-anxiety and GHQ-anxiety was confirmed to be significant by Sobel's test ($Z = 3.64$, $p < .05$).

Table 7.5 Model Summary of Multiple Regression Analyses of GHQ-20 by AAS and SES

Table 7.6 Coefficients of Multiple Regression Analyses of GHQ-20 by AAS and SES

4 Discussion

Research shows a strong link between adult attachment and mental health, but little is known about the mechanisms that underlie these relationships. In the present study, the mediating effects of self-esteem on attachment and mental health were tested.

As expected, self-esteem strongly mediated the relationships between attachment and the three subscales of GHQ-20. High attachment avoidance and anxiety were negatively associated with self-esteem, and low self-esteem predicted a low sense of adequacy, high depression and anxiety of GHQ-20. High Close and Depend of AAS were positively associated with high self-esteem, and high self-esteem predicted a high sense of adequacy of GHQ-20. Moreover, high Anxiety of AAS was negatively associated with self-esteem, and low self-esteem predicted high depression and anxiety of GHQ-20. The result is consistent with previous research (Roberts, Gotlib & Kassel, 1996), in which insecure attachment predispose individuals to low self-worth contingencies and self-esteem, and this is

directly associated with increases in depressive symptoms over time. Similar to this, individuals with high attachment anxiety and avoidance tend to appraisal themselves and others with dysfunctional attitudes, which in turn result in lower self-esteem. Such low level of self-esteem makes one person feel himself lack of adequacy, experience more depression and anxiety.

In addition, the two instruments of attachment showed some difference in the underlying construction of attachment. Attachment anxiety of ECRS had a high positive correlation with the Anxiety of AAS, and low correlations with the other subscales of AAS. However, on the other hand, attachment avoidance of ECRS had a moderate positive correlation with the Anxiety of AAS, and a high negative correlation with Close and Depend of AAS. This result indicated that the components of attachment avoidance may be multiple and a little complex. Therefore, attachment avoidance's predictive effects are not very strong and clear in contrast to attachment anxiety.

Table 7.1 *Means, Standard Deviations, and Correlations among ECRS, AAS, SES, GHQ-20*

	M	SD	2	3	4	5	6	7	8	9
1 ECRS _ avoidance	3.76	0.71	- .04	- .55***	.22**	- .36***	- .28***	- .17*	.23**	.20**
2 ECRS _ anxiety	3.81	0.93		- .10	.64***	- .02	- .28***	- .24**	.20**	.19**
3 AAS _ close	19.84	4.10			- .38***	.26***	.26***	.23**	- .24**	- .16*
4 AAS _ anxious	15.93	4.66				- .15*	- .31***	- .17*	.32***	.25***
5 AAS _ depend	17.21	3.63					.14	.24**	- .07	- .11
6 SES	28.86	5.04						.44***	- .52***	- .45***
7 GHQ _ adequacy	5.79	2.25							- .35***	- .34***
8 GHQ _ depression	1.41	1.54								.60***
9 GHQ _ anxiety	1.65	1.64								

*p < 0.05, **p < 0.01, ***p < 0.001

Table 7.2 Model summary of Multiple Regression Analyses of GHQ-20 by ECRS and SES

Dependent variable	Model	R	R^2	Adjusted R^2	ΔR^2	F Change
GHQ - adequacy	1	.30	.09	.08	.09	9.63^{***}
	2	.46	.21	.20	.12	31.22^{***}
GHQ – depression	1	.31	.10	.09	.10	10.63^{***}
	2	.53	.28	.27	.18	50.38^{***}
GHQ - anxiety	1	.28	.08	.07	.08	8.48^{***}
	2	.46	.21	.20	.13	33.40^{***}

Note. Predictors in Model 1 are avoidance and anxiety of ECRS; predictors in Model 2 are avoidance and anxiety of ECRS, and SES.

***$p < 0.001$

Table 7.3 Coefficients of Multiple Regression Analyses of GHQ-20 by ECRS and SES

Predictors	Dependent variable								
	GHQ-adequacy			GHQ-depression			GHQ-anxiety		
	B	SE	β	B	SE	β	B	SE	β
Model 1									
ECRS _ Avoidance	- .56	.21	- .18**	.51	.15	.24**	.47	.16	.21**
ECRS _ Anxiety	- .59	.16	- .24***	.35	.11	.21**	.35	.12	.20**
Model 2									
ECRS _ Avoidance	- .21	.21	- .07	.22	.14	.10	.21	.15	.09
ECRS _ Anxiety	- .33	.16	- .13*	.13	.11	.08	.15	.12	.08
SES	.17	.03	.38***	- .14	.02	- .47***	- .13	.02	- .40***

*p < 0.05, **p < 0.01, ***p < 0.001

Table 7.4 Sobel's test of mediation of self-esteem between ECRS and GHQ-20

	GHQ-adequacy	GHQ-depression	GHQ-anxiety
ECRS _ Avoidance	-3.30*	3.57*	3.38*
ECRS _ Anxiety	-3.27*	3.53*	3.35*

*$p < 0.05$

Table 7.5 Model summary of Multiple Regression Analyses of GHQ-20 by AAS and SES

Dependent variable	Model	R	R^2	Adjusted R^2	ΔR^2	F Change
GHQ - adequacy	1	.31	.09	.08	.09	6.61^{***}
	2	.49	.24	.23	.15	37.44^{***}
GHQ – depression	1	.34	.12	.10	.12	8.61^{***}
	2	.56	.31	.30	.19	53.55^{***}
GHQ - anxiety	1	.27	.07	.06	.07	5.14^{**}
	2	.47	.23	.21	.15	37.32^{***}

Note. Predictors in Model 1 are close, anxious, and depend of AAS; predictors in Model 2 are close, anxious, and depend of AAS, and SES.

**p < 0.01, ***p < 0.001

Table 7.6 Coefficients of Multiple Regression Analyses of GHQ-20 by AAS and SES

Predictors	Dependent variable								
	GHQ-adequacy			GHQ-depression			GHQ-anxiety		
	B	SE	β	B	SE	β	B	SE	β
Model 1									
AAS_ Close	.08	.04	.15*	- .05	.03	- .14[a]	- .03	.03	- .07
AAS _ Anxious	- .04	.04	- .09	.09	.02	.26***	.08	.03	.22**
AAS _ Depend	.11	.04	.18*	.00	.03	.01	- .03	.03	- .06
Model 2									
AAS_ Close	.05	.04	.09	- .03	.03	- .07	.00	.03	.00
AAS _ Anxious	.00	.03	.01	.05	.02	.15*	.04	.02	.12
AAS _ Depend	.10	.04	.16*	.02	.03	.04	- .01	.03	- .03
SES	.18	.03	.41***	- .14	.02	- .47***	- .14	.02	- .41***

Note. a. Sig. = .057, is borderline statistical significance ($p < .06$)

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Chapter 8: Study 3 Relationships among attachment, coping, GHQ-30 and QOL for Japanese students

1 Purpose of study

Although some studies have examined the mediating effects of coping with stress between attachment and mental health (e.g., Wei, Vogel, Ku, & Zakalik, 2005; Wei, Heppner, & Mallinckrodt, 2003; Schottenbauera et al., 2006), there are some arguments and insufficiencies in these studies. First, the effects of coping strategies in these studies are not consistent with each other, even contradictory. Second, these studies are mainly conducted in Western countries, whether the results are universal for other cultures especially Asian cultures is not confirmed. Third, most of these studies explore the relationships between attachment and positive indicators or negative indicators of mental health. In fact, the absence of mental illness may not equal the status of mental health. It is necessary to discuss the relations between attachment, coping and both positive indicators and negative indicators of mental health.

Therefore, the purpose of study 3 was to explore whether adult attachment predicted general mental health (negative indicator of mental health) and quality of life (positive indicator of mental health) by examining the direct effect of attachment and the mediating effects of coping with a Japanese students' sample, which will supplement the existing knowledge about attachment, coping and mental health.

Research suggests that individuals with high levels of attachment anxiety and avoidance tend to use ineffective coping strategies to deal with stress, which in turn increases their feelings of distress (Wei et al., 2005). On the other hand, research also found that anxiety attachment was positively associated with both adaptive coping and maladaptive coping, while avoidance attachment had only negative association with adaptive coping (Belizaire & Fuertes, 2011). According to attachment theory, coping theory and the results of previous research, the following hypotheses were created.

Hypothesis 1: Attachment anxiety and avoidance have a direct association with mental health: they are positively related to GHQ-30 (higher score of GHQ-30 means worse mental health) and negatively related to QOL (higher score of QOL means better mental health).

Hypothesis 2: Attachment avoidance is negatively associated with positive coping, and positive coping has a negative influence on GHQ-30.

Hypothesis 3: Attachment anxiety is positively associated with negative coping, and negative coping has a positive influence on GHQ-30.

Hypothesis 4: Attachment avoidance is negatively associated with positive coping, and positive coping has a positive influence on QOL.

Hypothesis 5: Attachment anxiety is positively associated with negative coping, and negative coping

has a negative influence on QOL.

2 Method

2.1 Participants

In the present study, the participants were 300 Japanese undergraduate students (from a variety of majors) from two private universities and one top national university in Tokyo, who were obtained in a psychological class. The sample comprised 145 (48.3%) men and 152 (50.7%) women, and 3 students did not give their gender. Their ages ranged from 18 to 27 years (M = 19.75, SD = 1.18). Among the participants, 47 (15.7%) were only children, while 253 (84.3%) had siblings. In addition, 99 (33.0%) students had experienced romantic relationships, while 198 (66.0%) students did not have such experience, and 3 students did not answer this item.

2.2 Measures

Experiences in Close Relationships Scale (ECRS) (Brennan, Clark, & Shaver, 1998). The ECRS was administered in order to assess the participants' attachment orientations. The ECRS has two subscales: attachment anxiety and attachment avoidance. High scores indicate high levels of attachment anxiety or attachment avoidance. In the present study, the Japanese version (Nakao & Kato, 2004) was used. Internal reliability (alpha coefficient) was .86 for avoidance and .90 for anxiety.

The Brief Coping Orientations to Problems Experienced Scale (COPE) (Carver, 1997). The brief COPE is an abridged version of the COPE (Carver, Scheier, & Weintraub, 1989) that was specifically developed to reduce the total participant response burden, and it can be tailored to the population under examination to address specific research questions without compromising the integrity of the instrument (Carver, 1997). The brief COPE has 14 subscales (self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame), each comprised of 2 items. Each item deals with a particular way of coping, using a 4-point Likert scale (1 = I have not been doing this at all, 4 = I have been doing this a lot). The Japanese version (Otsuka, 2008) was used in the present study, and internal reliability (alpha coefficient) was .42-.89 for the 14 subscales of brief COPE.

General Health Questionnaire (GHQ); (Goldberg & Hillier, 1979). The GHQ was developed to assess the extent of psychiatric illness in general practice. The original 60-item GHQ has produced a number of other scales such as the GHQ-30, GHQ-28, and GHQ-12. GHQ-30 was based on questions that provided the best discrimination among the original criterion groups. In addition, it was designed so that it contained equal numbers of questions, where positive answers showed either health or illness. GHQ-30 consisted of six subscales: general illness, somatic symptoms, sleep disturbance, social

dysfunction, anxiety and dysphoria, and suicidal depression. The Japanese version of GHQ-30 (Nakagawa & Daibo, 1985) was used in the present study, which was scored as a Likert scale (0, 1, 2, 3; 0 = never, 3 = often). In the present study, the total score of QOL was analyzed, and the internal reliability (alpha coefficient) of the GHQ-30 was .73.

Quality of Life (QOL); (Machizawa, Ishikawa, & Ago, 1994). The World Health Organization's (WHO; 2004) definition of QOL is increasingly recognized as the accepted multidimensional definition in the cross-cultural and psychological literature and takes into account the individual's subjective evaluation of QOL in a cultural, social, and environmental context. The version of QOL used in the present study is a 31-item self-rated scale developed by Machizawa et al. (1994) to measure subjective well-being. It contains six subscales representing six factors extracted through factor analysis: 1) Meaning of life and hopeful expectations about the future; 2) Enjoyable life and work satisfaction; 3) Peace of mind and subjective health; 4) Satisfaction with financial status and environment; 5) Satisfaction with close relationships; 6) Self-esteem and social support. In the present study, the total score of QOL was analyzed, which was scored using "yes" or "no" (yes = 1, no = 0), and the internal reliability (alpha coefficient) was .89.

2.3 Procedure

After obtaining the instructors' permission, a researcher went to the psychology class to describe the study. Students were given survey packets, which included the consent form, demographic items, and the Japanese version of the ECRS, brief COPE, GHQ-30, and QOL. No personally identifying information was requested in the survey. Students who did not wish to participate simply returned their survey packets without answering them at the time of submission, along with the other students. The entire procedure lasted about 25 min.

3 Results

Data-cleaning procedures were conducted before the preliminary analyses. Eight responses from the Japanese sample were discarded from the analyses because the data came from international and graduate students. Self-distraction and venting of COPE were excluded from all subsequent analyses because the alpha coefficients of the two subscales were below .60. The means and standard deviations of all variables were calculated, and are shown in table 8.1.

Table 8.1 Means and standard deviations of ECRS, COPE, GHQ-30, and QOL

Next, factor analysis for subscales of COPE was conducted. Bartlett's test of sphericity was tested for the 12 subscales of COPE and KMO was 0.69, which means the method of factor analysis can be adopted. Principal components and varimax were selected in the analysis. On basis of the results of Eigenvalues and scree plot, two factors were extracted, which explained 40.36% of the variance. Items

in the rotated matrix and their loadings in the factor are shown in table 8.2. Because the loading of the subscale of religion was below .30 and obvious dual loadings exist in the subscales of humor and acceptance, these three subscales were removed from the factor analysis. According to the meaning of the subscales, factor 1 is labeled as positive coping, and factor 2 is labeled as negative coping.

Table 8.2 The loadings of subscales of COPE on the extracted factors

Because sex differences have been found in attachment, coping and mental health (e.g., Song, Thompson, & Ferrer, 2009; Giudice, 2011; Gaylord-Harden, Taylor, Campbell, Kesselring, & Grant, 2009), we conducted multivariate analysis of covariance to explore whether gender differences exist in these variables. The dependent variables are subscales of ECRS, extracted factors of COPE, and GHQ-30, and the independent variable is gender. The results showed gender had no significant main effects on these variables (Pillai's Trace = 0.04, but $F_{(6, 283)} = 1.81$, $p > .05$). Therefore, all subsequent analyses were conducted across gender.

Pearson correlations between subscales of ECRS, extracted factors of COPE, GHQ-30, and QOL were calculated. The results are shown in table 8.3. Attachment avoidance and anxiety have a significantly positive association with GHQ-30, and a significantly negative association with QOL. This result supports hypothesis 1.

Table 8.3 The correlations among subscales of ECRS, extracted factors of COPE, GHQ-30, and QOL.

The method of path analysis was used to analyze the relationships between attachment, coping, and mental health with the software of Lisrel 8.70. The analysis used covariance matrix and the maximum likelihood method, and the model was set on the basis of the hypotheses and the correlations in table 8.3. There were no significant correlations between attachment avoidance and negative coping, or between attachment anxiety and positive coping, and these two paths were therefore not included in the model. The standard of a good fit model is (1) $\chi^2/df < 2$, (2) GFI > 0.9, (3) AGFI > 0.8, (4) RMSEA < 0.05 (MacCallum & Austin, 2000). The path model (see Fig. 8.1) showed an excellent fitting that is $\chi^2/df = 0.80$, df = 3, p = 0.85, GFI = 1.00, CFI = 1.00, AGFI = 0.99, RMSEA = .00, SRMR = 0.01 (N = 300).

Fig. 8.1 The path model of attachment, coping, GHQ-30, and QOL

According to the path model, positive coping partially mediated the relationship between attachment avoidance and QOL, and negative coping partially mediated the relationship between attachment anxiety and QOL. Hypothesis 4 and hypothesis 5 are supported by these results. However, mediation effects of coping between attachment and GHQ-30 were not found and hypothesis 2 and hypothesis 3 were not supported. In addition, the associations between attachment and GHQ-30/QOL were

confirmed again as the same as the result of correlations. The total effect is calculated by adding direct effect and indirect effect. The total effect from attachment avoidance to QOL was -0.30 (β = -0.16×0.10-0.28 = -0.30), and from attachment anxiety to QOL was -0.25 (β = -0.37×0.36-0.12 = -0.25).

4 Discussion

Some researchers have begun to explore the relationships among attachment, coping, and psychological and social functioning (Lopez et al., 2001; Belizaire & Fuertes, 2011; Schottenbauera, et al., 2006). However, few studies have examined how these relationships are expressed in Eastern cultures. The present study extended the literature on how attachment influences mental health in Eastern cultures. The findings suggest that attachment avoidance and attachment anxiety have direct and indirect effects on general mental health and quality of life.

On one hand, individuals with high attachment avoidance and attachment anxiety showed a high GHQ-30 score, and a low QOL score. This result is consistent with previous research in which insecure attachment is associated with mental problems (e.g., Taylor et al., 2000; Bosmans et al., 2010). Individuals with attachment insecurity have negative beliefs on themselves and others, which brings a general vulnerability to mental problems.

On the other hand, the mediating effects of coping between the two dimensions of attachment and QOL were also found: positive coping mediated the link between attachment avoidance and QOL, and negative coping mediated the link between attachment anxiety and QOL. When faced with a stressful situation, individuals with high attachment anxiety or avoidance tended to select negative coping or to avoid positive coping responses, which resulted in poor quality of life. The results showed that the two dimensions of attachment work in different ways and so influence mental health through different kinds of coping. Individuals with high attachment anxiety do not trust themselves to be worthy, which may influence the secondary appraisal of coping (Schore, 2001) to recognize their lack of resources and then choose negative coping (Lazarus, 1991), such as denial, disengagement, self-blame, to meet with the stress. Such coping strategies will further decrease self-worthy experiences and make individuals feel worse quality of life. Conversely, the individuals with attachment avoidance do not trust others and always avoid getting close to others, which make them avoid positive coping strategies, such as active coping, use of emotional support, use of instrumental support. This will not help them to deal with stress and make them feel lower quality of life.

In addition, although mediating effects of coping between attachment and QOL were found, there were no significant mediating effects of coping between attachment and GHQ-30. Correlation results showed GHQ-30 had significant correlation with negative coping, but not positive coping, while QOL

had significant correlations with both positive coping and negative coping. In another word, when individuals meet with stress, the utilization of negative coping may lead to poor general mental health, but avoiding to use positive coping has no effects on GHQ-30. With regard to QOL, negative coping certainly makes individuals feel a low quality of life, but utilization of positive coping may promote their quality of life. GHQ-30 and QOL are simultaneously used in the present study as the predictors of mental health, but the different emphases of these two instruments lead to different results. The finding proved that the opposite of mental illness may not equal to mental health (Jahoda, 1958) and more interesting outcomes will be discovered if we use a diversity of instruments in future studies.

Table 8.1 Means and standard deviations of the ECRS, COPE, GHQ-30, and QOL

scales	*M*	*SD*
GHQ-30	30.71	15.54
QOL	20.91	6.80
Attachment avoidance	3.85	0.91
Attachment anxiety	3.52	0.98
C1: self-distraction	—	—
C2: active coping	5.73	1.43
C3: denial	2.65	1.15
C4: substance use	2.87	1.53
C5: use of emotional support	5.29	1.69
C6: use of instrumental support	5.30	1.79
C7: behavioral disengagement	3.86	1.52
C8: venting	—	—
C9: positive reframing	5.22	1.59
C10: planning	5.65	1.48
C11: humor	4.13	1.79
C12: acceptance	5.95	1.30
C13: religion	3.20	1.69
C14: self-blame	5.27	1.66

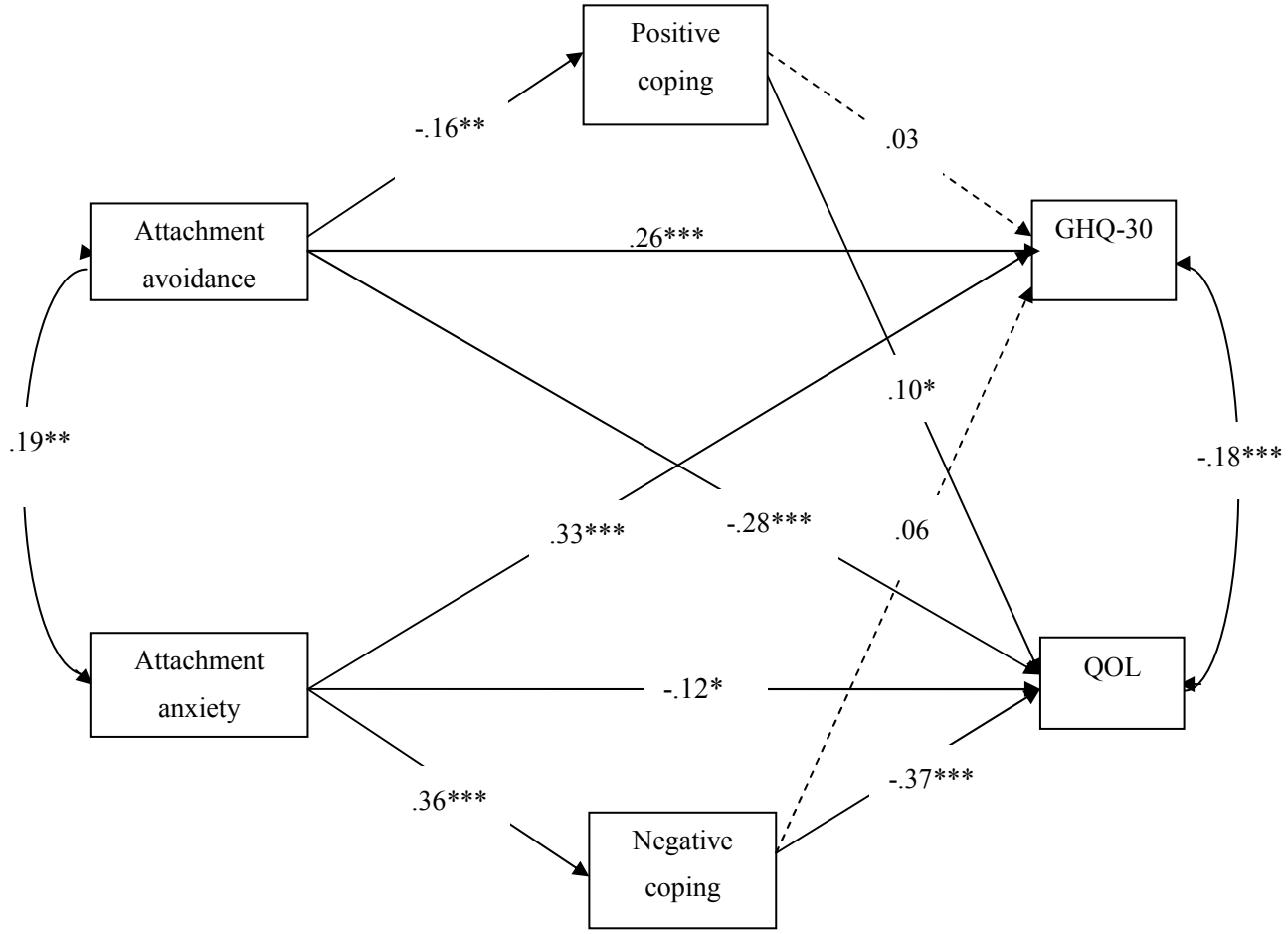
Table 8.2 The loadings of subscales of COPE on the extracted factors

subscales	Factor1	Factor 2
C5: use of emotional support	**.75**	.06
C6: use of instrumental support	**.75**	.02
C2: active coping	**.68**	- .25
C10: planning	**.62**	- .28
C9: positive reframing	**.61**	- .10
C11: humor	**.30**	.23
C13: religion	**.30**	.15
C3: denial	- .04	**.73**
C7: behavioral disengagement	- .21	**.64**
C4: substance use	.12	**.54**
C12: acceptance	**.33**	**- .45**
C14: self-blame	.12	**.43**

Table 8.3 the correlations among subscales of ECRS, extracted factors of COPE, GHQ-30, and QOL.

	2	3	4	5	6
1. attachment avoidance	.19**	.34***	- .42***	- .39***	.10
2. attachment anxiety		.44***	- .34***	.07	.41***
3. GHQ-30			- .58***	- .05	.46***
4. QOL				.30***	- .40***
5. positive coping					.00
6. negative coping					

**p < 0.01, ***p < 0.001



N = 300, * p ＜.05， ** p ＜.01， *** p ＜.001

χ^2 /df= 0.80, df = 3, p = 0.85, GFI = 1.00, CFI = 1.00, RMSEA = .00, AGFI = 0.99, SRMR = 0.01

Standardized path coefficient is shown in the figure. The dotted line means the path is not significant.

Fig. 8.1　The path model of attachment, coping, GHQ-30, and QOL

Part IV Attachment and Mental Health: Influences of Cultural Context

Chapter 9: Study 4 Attachment, coping and GHQ-30: Comparison of Chinese and Japanese undergraduate students

1 Purpose of study

At present, the vast majority of research on adult attachment orientations, working models and their derivations has been primarily conducted in Western societies (e.g., Doherty, Hatfield, Thompson, & Choo, 1994; Wei, Russell, Mallinckrodt, & Vogel, 2007), but they are deviating from the cultural values of many non-Western and mainly rural ecosocial environments (Keller, 2013). Researchers have called for more empirical studies on non-White adult populations (Wang & Mallinckrodt, 2006; Wang & Ratanasiripong, 2010), such as Japanese and Chinese. Although China and Japan are geographically close and historically connected, the two countries' cultural distance (i.e., difference) is not as close as we think. In particular, the differences in family structure, parental rearing between the two countries may impact on the expression of attachment and its links to other variables. It may be important and meaningful to compare the differences and similarity of the representations of attachment between the two Asian countries. However, by now, research of attachment is conducted only for Japanese populations or Chinese populations, few studies are done to compare the two groups about attachment. The main purpose of study 4 was to compare the relationships among attachment, coping and mental health between the two cultural groups: Japanese and Chinese undergraduate students.

Some studies have investigated the differences in mental health between the two countries. In the negative health scores, the scores for Japanese students were higher than those for Chinese students. Japanese students were more nervous, instable, depressive and irritative than Chinese who were more positive, confident and stable in mood (Yamada, Hiyakawa, & Minematsu, 1994).

Little empirical evidence was related to the comparison of attachment between Japanese and Chinese populations, and few studies investigated the effects of various coping strategies of COPI on attachment and mental health. Because less information can be obtained from previous research, as a exploratory study, it is difficult to generate specific hypotheses. Therefore, the following hypotheses are generated on basis of the theoretical framework and our understanding of the two countries' cultures.

First, we hypothesize high attachment avoidance and/or attachment anxiety is associated with high score of the GHQ-30. Second, we hypothesize coping mediate linkages between attachment and mental health for both Japanese sample and Chinese sample. Individuals with high attachment avoidance tend to avoid positive coping, while individuals with high attachment anxiety tend to use negative coping to deal with stress, which in turn bring them problems of mental health. Third, we hypothesize Japanese

samples' expressions of attachment orientations, coping, mental health are different to Chinese samples. Fourth, the mediating models of coping are different between Japanese and Chinese samples.

2 Method

2.1 Participants

In the present study, the participants were 300 Japanese undergraduate students from two private universities and one top national university in Tokyo (the same to participants in study 3), and 194 Chinese undergraduate students from two top national universities in Beijing. Both Japanese and Chinese students (from a variety of majors) were obtained from psychological classes. The Japanese sample comprised of 145 (48.3%) men and 152 (50.7%) women (sex of 3 students is unknown), and their ages ranged from 18 to 27 years (M = 19.75, SD = 1.18). Among the participants, 47 (15.7%) were only children, while 253 (84.3%) had siblings. In addition, 99 (33.0%) students had experienced romantic relationships, while 198 (66.0%) students had not such experience. The Chinese sample comprised of 85 (43.8%) men and 109 (56.2%) women. The participants' ages ranged from 17 to 22 years (M = 19.35, SD = 0.82). 133 (68.6%) were only children, while 61 (31.4%) had siblings. In addition, 82 (42.3%) students had experienced romantic relationships, while 106 (56.4%) students had not such experience.

2.2 Measures

Experiences in Close Relationships Scale (ECRS) (Brennan et al., 1998). The ECRS was administered in order to assess the participants' attachment orientations. In the present study, the Japanese version (Nakao & Kato, 2004) and Chinese version (Li & Kato, 2006) of the ECRS were used for the Japanese and Chinese samples, respectively. Internal reliability (alpha coefficient) for the Japanese sample was .86 for avoidance and .90 for anxiety; internal reliability for the Chinese sample was .78 for the avoidance subscale and .88 for the anxiety subscale.

The Brief Coping Orientations to Problems Experienced Scale (COPE) (Carver, 1997). The brief COPE is an abridged version of the COPE (Carver, Scheier, & Weintraub, 1989). The Japanese version (Otsuka, 2008) and the Chinese version (Zhang, 2004) were used for the Japanese and Chinese student samples, respectively. Internal reliability (alpha coefficient) for the Japanese sample was .42-.89; internal reliability for the Chinese sample was .40-.81. The alpha coefficients of Self-distraction and Venting for both Japanese and Chinese students are below .60, and so the two subscales are not analyzed in the present study.

General Health Questionnaire (GHQ) (Goldberg & Hillier, 1979) The GHQ was developed to assess the extent of psychiatric illness in general practice. Higher scores in GHQ-30, poorer mental health they have. The Japanese (Nakagawa & Daibo, 1985) and Chinese versions (Chan, 1985) of the

GHQ-30 were used in the present study for the Japanese and Chinese student samples, respectively. Internal reliability (alpha coefficient) of the GHQ-30 was .73 for the Japanese sample and .91 for the Chinese sample.

2.3 Procedure

Students were given survey packets, which included the consent form, demographic items, the ECRS, brief COPE, and GHQ-30 in Japanese or Chinese. No personally identifying information was requested in the survey. Students, who did not wish to participate in the investigation, simply returned their survey packets without answering them at the time of submission, along with the other students. The entire procedure required about 25 min for both the Japanese and Chinese students.

3 Results

3.1 Preliminary analyses

Data-cleaning procedures were conducted before the preliminary analyses. Eight responses from the Japanese sample were discarded from the analyses because the data came from international and graduate students. We conducted t-test analysis to explore whether students' gender was significantly related to our set of attachment, coping, and mental health. Although the sex differences about attachment avoidance and anxiety have been found in previous studies (e.g., Giudice, 2011), the results in the present study showed no significant sex differences for attachment avoidance, attachment anxiety and mental health for both Japanese and Chinese samples. However, a few coping responses were different with gender for both of the two samples. Therefore, we treated gender as a controlling variable to eliminate the effects of gender in the subsequent regression analyses.

Table 9.1 presents the means and standard deviations of the ECRS, GHQ-30 and the brief COPE, and t-test results of the differences of these variables between the two ethnic groups. The results showed that Japanese attachment avoidance was significantly higher than Chinese, whereas Japanese attachment anxiety was significantly lower than Chinese. The expressions of attachment orientations are different between Japanese and Chinese samples. Japanese students' mental health was significantly worse than Chinese. In regard to COPE, there were significant differences between Japanese students and Chinese students for all of the subscales. Japanese students' scores were higher than Chinese in three subscales (substance use, behavioral disengagement, and self-blame), and in other 9 subscales Japanese scores were lower than Chinese. Therefore, hypothesis 3 was supported by these results, which showed Japanese students' scores of attachment, coping and mental health were different to Chinese. Correlations among subscales of coping and the subscales of ECRS, GHQ-30 for the Japanese and Chinese samples were calculated and presented in table 9.2.

Table 9.1 Mean and Standard deviations of variables and results of t-test between two ethnic groups

Table 9.2 Correlations among coping and ECRS, GHQ-30 for the Japanese and Chinese samples

3.2 Simple and multiple linear regression analyses

Hypothesis 1 stated high attachment avoidance/anxiety is associated with poor mental health. To test hypothesis H1, we ran two simple regression analyses to examine the relationship between attachment anxiety and GHQ-30, attachment avoidance and GHQ-30 respectively. We interpreted results by considering both standardized regression coefficients (β) and the squared structure coefficients (R^2), following Thompson's (2006) guidelines. Hypothesis 1 was supported in both two samples by the simple regression for attachment anxiety and GHQ-30 ($\beta = 0.44$, $R^2 = 18.9\%$, $p < 0.001$ for Japanese sample; $\beta = 0.44$, $R^2 = 19.1\%$, $p < 0.001$ for Chinese sample), and by the simple regression for attachment avoidance and GHQ-30 ($\beta = 0.34$, $R^2 = 11.6\%$, $p < 0.001$ for Japanese sample; $\beta = 0.19$, $R^2 = 3.7\%$, $p < 0.01$ for Chinese sample).

Next, we conducted two hierarchical multiple regression (HMR) analyses of the GHQ-30 to examine the mediating effects of coping responses respectively for two ethnic groups. In every HMR analyses, gender was entered as a control variable firstly. Attachment orientations were entered as the second block with stepwise method. The COPE subscales were entered together as the third block with stepwise method. The results of the HMR analyses of the GHQ-30 were shown in table 9.3.

Table 9.3 Summary of HMR analyses predicting GHQ-30 by attachment and coping for Japanese and Chinese samples

The results of Japanese sample in table 9.3 indicated that attachment anxiety and avoidance collectively accounted for 25.3% of the variance in the GHQ-30 score. In addition, after controlling for attachment orientations, Substance use, Denial, Self-blame, and Humor significantly enhanced the prediction of the GHQ-30 by explaining an additional 12.6% of the variance. The results of Chinese sample indicated that attachment anxiety and avoidance collectively accounted for 20.4% of the variance in the GHQ-30 score. After controlling for attachment orientations, Behavioral disengagement and Use of instrumental support significantly enhanced the prediction of the GHQ-30 by explaining an additional 8.7% of the variance.

Comparing with the results of simple regressions, all of attachment orientations' predictive effects (β) reduced when considering the effects of coping in the two regression analyses (2 cultural groups), in which attachment avoidance for Chinese sample was no longer significant. The reduction in β indicates potential mediators linking attachment and GHQ-30.

In order to test the hypothesis 2, four conditions have to be tested (Baron & Kenny, 1986): a. the predictor should be related to the dependent variable; b. the predictor should be related to the mediator; c. the mediator should be related to the dependent variable when controlling for the predictor; d. the

effect of the predictor (β) on the dependent variable should diminish when the effect of the mediator is controlled. Considering the correlations in table 9.2 and the results of the simple and multiple regression analyses, Substance use, Denial, Self-blame for attachment anxiety and GHQ-30, and Self-blame and Humor for attachment avoidance and GHQ-30 met all four of the criteria in Japanese sample. Sobel test verified the significant mediation effects of Substance use ($Z = 2.62$, $p < 0.05$), Denial ($Z = 2.27$, $p < 0.05$), Self-blame ($Z = 2.43$, $p < 0.05$) for attachment anxiety and GHQ-30, Self-blame ($Z = 2.07$, $p < 0.05$) for attachment avoidance and GHQ-30. In Chinese sample, Behavioral disengagement for attachment anxiety and GHQ-30 and Use of instrumental support for attachment avoidance and GHQ-30 met all four of the criteria. Sobel's (1982) test verified the significant mediation effects of Behavioral disengagement ($Z = 2.27$, $p < 0.05$) and Use of instrumental support ($Z = 2.81$, $p < 0.05$).

Therefore, hypothesis 2 was supported that coping mediated the link between attachment and mental health for both Japanese sample and Chinese sample.

3.3 The differences of mediating models of coping

By examining the potential mediating roles of coping, we got two mediating models of coping between attachment and GHQ-30 in two cultural groups (Fig.9.1). Our models supported the hypothesis 3, which stated the mediating effects of coping responses vary with different cultural groups. In details, for Japanese sample, Substance use, Denial and Self-blame mediated the association between attachment and GHQ-30. For Chinese sample, Behavioral disengagement and Use of instrumental support mediated the association between attachment and GHQ-30. Therefore, the different mediating models of coping supported hypothesis 4.

Fig.9.1. Mediating models of coping between attachment and GHQ-30 for Japanese and Chinese samples

4 Discussion

The present study was the first to compare two Asian ethnic groups of Japanese and Chinese students with regard to the relationships between attachment and mental health by examining the mediating effects of coping responses. The findings in the present study with the samples of several universities in Tokyo and Beijing generally supported the hypotheses that we derived from attachment theory, and our understanding of Japanese and Chinese cultures.

Our first major finding was the mediating effects of coping responses between attachment and mental health were found in both two cultural groups. It seems that students with insecure attachment, when faced with the stressful situation, tended to select negative coping responses and to avoid positive coping responses, which resulted in poor mental health. This mediation finding for mental health is

consistent with Lopez et al.'s study (2001) on Western undergraduate students, whose coping styles (reactive coping and suppressive coping) mediated the linkage between insecure attachment orientations and distress. According to coping theory (Krohne, 2001), the trait-oriented theory and microanalytic approach was used in the present study to explore the specific and concrete coping strategies which effected as a mediator. Compared to previous research, more coping responses were verified in the present study to mediate the links between attachment and mental health in two Eastern cultural groups, which showed that coping with stress may be an important mediating role to explain the mechanism of attachment on psychological outcomes.

The second major finding is that cultural differences between Japanese and Chinese groups were found in the present study. The expressions of attachment orientations varied with the cultural groups: Japanese sample's attachment avoidance is higher than Chinese sample, while Chinese sample's attachment anxiety is higher than Japanese sample. This may be explained by the differences of the family constructs and parental rearing of these two cultural groups (Oyama & Tsujino, 2003).

In Japanese society, it is universal that there are few bonds of affection bonds between children and their fathers because of fathers' hard work and lack of responsibility for their children's parental rearing (Tamura, 2001). In one study with Japanese college students (Hashimoto, 2010), individuals with low attachment to their fathers were generally self-centered with unstable emotions that influenced their avoidance of interpersonal relationships. On the other hand, Japanese mothers play an important role in the parenting of children and meet all of physical and psychological needs of the children, but few supports from family and society can be obtained. As a result, a few mothers have problems on rearing their children, and adopt avoidant behaviors and attitudes to the children; other mothers may be excessively close to their children, and this will make the children feel stressful and tend to keep distance from their mothers. These discussed above may be some reason to explain Japanese higher levels of attachment avoidance.

Conversely, in Chinese society, it is common that mothers begin their work as soon as they give birth (Zhou & Wang, 2010). As a result, many parents are busy for work and have no time and energy to care their children. Therefore, it is a special phenomenon in China that children's grandfather and grandmother care them instead of children's parents. In particular, after the one child policy, parents are allowed to have only one child regardless of its sex (Lee, 2012). The children have no siblings and have no enough time to stay with parents in childhood. As a result, the Chinese children will be lonely and become anxious and worried about the frequent separation from their parents, and hope to get more closeness with their parents compared to Japanese sample.

In addition, it is also found that Japanese students have worse mental health than Chinese in the

present study. As the same to this, one study with Japanese and Chinese college students showed that the Japanese were more nervous, unstable, depressive, and irritable compared to the Chinese who were more positive, confident, and emotionally stable (Yamada et al., 1994). I think these differences in mental health and personality traits can be also explained by the differences of the family constructs and parental rearing between these two cultural groups. The Japanese families are virtually lacking of fathers, which brings up many social and mental problems. Moreover, the great stress which individuals perceive in Japanese society may be a reason for the poor mental health of Japanese sample.

The findings of the study also suggest that significant cultural differences exist in the mediating models. Chinese students utilize a combination of positive coping response such as Use of instrumental support, and negative one such as Behavioral disengagement. In contrast, the Japanese tend to select negative personal-orientated strategies, such as Substance use, Self-blame and Denial. According to this, faced with difficulties or problems, the Japanese are more susceptible to become depressed, whereas the Chinese tend to distract their negative mood to seek solutions. Furthermore, it is universal for people in Chinese society to seek help from others. The interpersonal borderline is not clear enough. Therefore, Chinese students are accustomed to asking for advice and support from others. In contrast, Japanese individuals are educated from childhood not to bother others for their own problems, and tend to deal with personal problems by themselves. Therefore, Japanese students may be unlike to seek support from others as their coping strategies when facing with stress.

Although these meaningful findings were obtained from the present study, our results may be not generalized to all college students from all regions of Japan and China, because the samples of the study only came from several universities in the capital cities of Japan and China. Therefore, the future study should use more universal samples of college students to examine the generalization of our findings in the present study.

Table 9.1 Mean and Standard deviations of variables and results of t-test between two ethnic groups

	Japanese	Chinese	
	Mean (*SD*)	Mean (*SD*)	*t*
Attachment anxiety	3.52 (0.98)	3.72 (1.00)	- 2.16*
Attachment avoidance	3.85 (0.91)	3.70 (0.76)	2.02*
GHQ-30	30.71 (15.54)	22.70 (12.93)	6.21***
C1: self-distraction	----	----	----
C2: active coping	5.73 (1.43)	6.37 (1.32)	- 4.99***
C3: denial	2.65 (1.15)	3.15 (1.26)	- 4.58***
C4: substance use	2.87 (1.53)	2.54 (1.19)	2.69**
C5: use of emotional support	5.29 (1.69)	5.71 (1.52)	- 2.89**
C6: use of instrumental support	5.30 (1.79)	5.84 (1.55)	- 3.58***
C7: behavioral disengagement	3.86 (1.52)	3.32 (1.39)	4.00***
C8: venting	----	----	----
C9: positive reframing	5.22 (1.59)	5.98 (1.49)	- 5.40***
C10: planning	5.65 (1.48)	6.20 (1.45)	- 4.08***
C11: humor	4.13 (1.79)	4.60 (1.70)	- 2.90**
C12: acceptance	5.95 (1.30)	6.43 (1.33)	- 3.93***
C13: religion	3.20 (1.69)	3.77 (1.76)	- 3.61***
C14: self-blame	5.27 (1.66)	4.81 (1.65)	3.03**

Note. C1 and C8 for the interpersonal situation are excluded from all subsequent analyses because the alpha coefficients of the two subscales were below .60; The GHQ-30's score represented general healthy symptoms, and higher score showed worse health.

*p < 0.05, **p < 0.01, ***p < 0.001

Table 9.2 Correlations among coping and ECRS, GHQ-30 for the Japanese and Chinese samples

	Japanese			Chinese		
	E1	E2	GHQ	E1	E2	GHQ
E1: Attachment anxiety		.19**	.34***		.12	.19**
E2: Attachment avoidance			.44***			.44***
C2: Active coping	-.25***	-.15*	-.18**	-.25***	-.12	-.13
C3: Denial	.11	.21***	.34***	.14	.27***	.32***
C4: Substance use	.06	.18**	.36***	.03	.24**	.30***
C5: Use of emotional support	-.42***	.17**	-.02	-.32***	.20**	-.10
C6: Use of instrumental support	-.44***	.14*	-.03	-.41***	.11	-.18*
C7: Behavioral disengagement	.23***	.24***	.22***	.11	.20**	.32***
C9: Positive reframing	-.17**	-.04	-.04	-.30***	-.01	-.22**
C10: Planning	-.11*	-.02	-.11	-.17*	.04	-.23**
C11: Humor	-.17**	.05	-.12*	-.04	.17*	.02
C12: Acceptance	-.14*	-.17**	-.16**	-.16*	-.01	-.21**
C13: Religion	-.07	.04	.09	.08	.03	.16*
C14: Self-blame	.19**	.32***	.31***	.01	.28***	.05

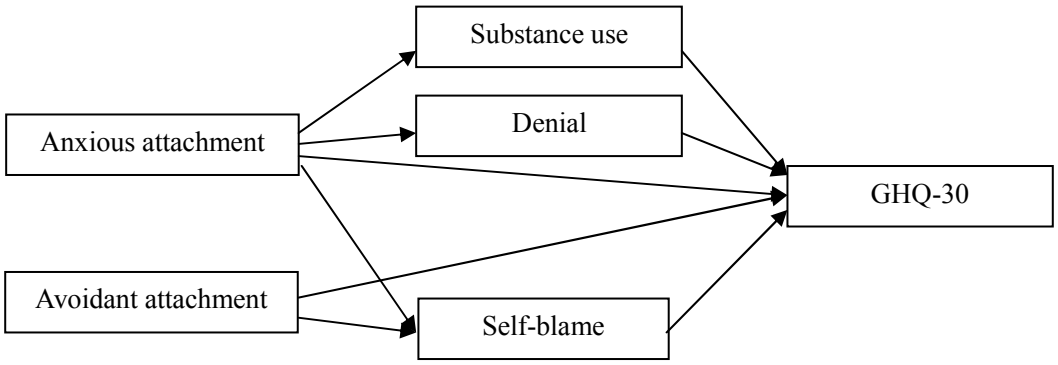
*p < 0.05, **p < 0.01, ***p < 0.001

Table 9.3 Summary of HMR analyses predicting GHQ-30 by attachment and coping for Japanese and Chinese samples

Variable	R^2	ΔR^2	*B*	*SE*	β	*t*
Japanese sample						
Gender	.00	.00	1.99	1.47	.06	1.36
Attachment anxiety	.19	.18***	4.35	0.80	.28	5.41***
Attachment avoidance	.26	.07***	3.68	0.83	.22	4.45***
Substance use	.34	.08***	2.42	0.50	.24	4.80***
Denial	.36	.02**	2.01	0.69	.15	2.92**
Self-blame	.37	.02**	1.23	0.46	.13	2.65**
Humor	.38	.01*	- 0.88	0.42	- .10	- 2.10*
Chinese sample						
Gender	.00	.00	0.04	1.62	.00	0.02
Attachment anxiety	.19	.19***	5.22	0.83	.41	6.32***
Attachment avoidance	.21	.02*	0.41	1.18	.02	0.35
Behavioral disengagement	.26	.05**	2.22	0.59	.24	3.77***
Use of instrumental support	.30	.04**	- 1.79	0.57	- .22	- 3.12**

*p < 0.05, **p < 0.01, ***p < 0.001

Model A: Japanese sample



Model B: Chinese sample

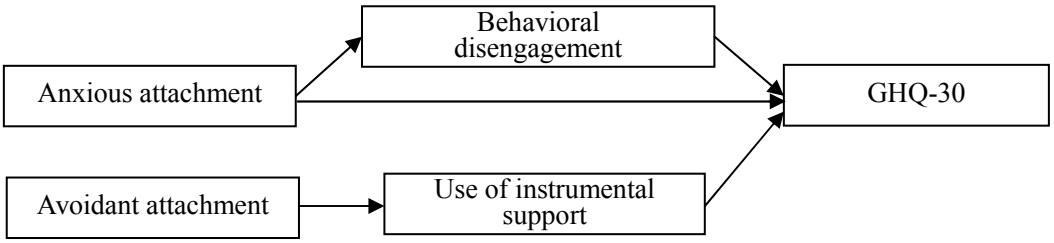


Fig.9.1. Mediating models of coping between attachment and GHQ-30 for Japanese and Chinese samples

Chapter 10: Study 5 Attachment, acculturation, and GHQ-30 of Chinese students in Japan

1 Purpose of study

Since most of the research of acculturation has primarily focused on Asian-American groups (Atkinson, Lowe, & Matthews, 1995; Chung, 2001; Liu Pope-Davis, Nevis, Nevitt, & Toporek, 1999), with few exploring acculturation in Asian countries (Sun, 2007), the purpose of study 5 is to broaden the prior and existing research on attachment, acculturation, and psychological adjustment through centering on Chinese students in Japan because of their rapidly increasing numbers beginning in the mid-1980s.

In light of the moderating effects posited in Berry et al. (1987)'s model and the existing literature, the effect of attachment, the modes of acculturation on general mental health as well as the interactive effect of attachment and acculturation on general mental health are examined in the present study. Adult attachment has been considered as an important predictor of successful adaptation (Wang & Mallinckrodt, 2006). Securely attached immigrants will not feel threatened by contact with other cultures (Oudenhoven & Hofstra, 2006), and can explore their new surroundings comfortably, which may have a positive effect on their psychosocial adjustment and mental health. In the acculturation process, attachment anxiety was found to be negatively associated with students' acculturation to U.S. culture and attachment avoidance was negatively associated with identification with home culture (Wang & Mallinckrodt, 2006). My review of the literature contributes toward the following four hypotheses.

Hypothesis 1: Attachment avoidance and attachment anxiety are positively associated with all subscales of GHQ-30 (high score means poor mental health).

Hypothesis 2: Attachment anxiety and attachment avoidance are negatively associated with identification to home culture and acculturation to host culture.

Hypothesis 3: Identification to home culture and acculturation to host culture are negatively associated with all subscales of GHQ-30.

Hypothesis 4: There are interactive effects between attachment orientations and modes of acculturation on international students' GHQ-30.

2 Method

2.1 Participants

Participants in the current study were 194 Chinese students who had lived in the greater Tokyo area for an average of 1.20 years (from three months to 7.08 years, SD = 1.28). The sample comprised 88 (45.4%) males and 106 (54.6 %) females between the ages of 18 and 33 (M = 23.43, SD = 2.42). Among the participants, 114 (58.8%) grew up as an only child, while 80 (41.2%) had siblings. In terms

of education, 61 (31.4%) were studying in Japanese language schools with plans to enter college or graduate school and 133 (68.6%) were studying in college or graduate schools.

2.2 Measures

Experiences in Close Relationships Scale (ECRS); (Brennan, et al., 1998). ECRS was administered in order to assess the participants' attachment orientations. In the present study, a Chinese version (Li & Kato, 2006) of ECRS was used for the student sample. Internal reliability (alpha coefficient) was .73 for the avoidance subscale and .89 for the anxiety subscale.

General Health Questionnaire (GHQ); (Goldberg & Hillier, 1979). GHQ was developed to assess the extent of psychiatric illness in general practice. GHQ-30 consists of six subscales: general illness, somatic symptoms, sleep disturbance, social dysfunction, anxiety and dysphoria, and suicidal depression. In the present study, a Chinese version (Chan, 1985) of GHQ-30 was used for the student sample. Internal reliability (alpha coefficient) was .93 for the total scale and between .56 and .93 for the six subscales.

Vancouver Index of Acculturation (VIA); (Ryder, Alden, & Paulhus, 2000). The VIA used in the present study is a 20-item pan-ethnic instrument designed to measure the heritage (home) and mainstream (host) dimensions of acculturation. Items are generated in pairs to assess several domains relevant to acculturation, such as values, social relationships, and adherence to traditions, with one item in each pair referring to Chinese culture and the other item referring to North American culture. Each item is rated on a 9-point Likert scale, ranging from 1 = strongly disagree to 9 = strongly agree. Higher subscale scores indicate higher levels of identification with the represented culture. In order to be consistent with other instruments used in this study, we modified the VIA so that each item was rated on a 7-point Likert scale, and "Japanese" was used instead of "North American" as the descriptor. In this case, internal reliability (alpha coefficient) was .83 for both subscales of home and host cultures.

VIA was translated into the subjects' native language of Chinese and then back translated into English following translation procedures that confirmed semantic equivalence and the reliability of questions (Brislin, 1980). Next, we examined the psychometric properties of translated VIA. Following Ryder et al.'s study (2000), factorial validity was established by means of principal component analysis with Promax rotation (Kappa=4) in the present study. Explorative factor analysis showed good constructive validity. The value of KMO and Bartlett's Test is .82. The structure of the two dimensions of acculturation to host culture and home culture were clear, and the loadings of the 10 items of host culture were .44-.76, while the loadings of the 10 items of home culture were .47-.74.

2.3 Procedure

The participants were students who were recruited in class. After obtaining the instructors'

permission, students were given survey packets, which included a consent form, demographic items, and the Chinese version of ECRS, GHQ-30, and VIA. No personal identification was requested in the survey. Students who did not wish to participate simply returned their survey packets without answering them at the time of submission with the other students. The entire procedure took approximately 10–15 mins.

3 Results

3.1 Preliminary analyses

Data-cleaning procedures were conducted before the preliminary analyses. Four responses from the class were discarded from the analyses because the items were not adequately answered.

Because gender differences with regard to attachment, acculturation and mental health have been found in some studies (e.g., Chung, 2001; Rahman & Rollock, 2004; Giudice, 2011), this study examined gender differences through a one-way analysis of variance (ANOVA). None of the variables showed significant gender differences, and thus subsequent analyses were collapsed across gender.

3.2 Tests of research hypotheses

The means and standard deviations of the various scale scores, and the Pearson correlation coefficients among the subscales of ECRS, VIA and GHQ-30 were calculated for the overall sample and the results are shown in table 10.1.

Table 10.1 Mean and standard deviations, and correlations among main variables

Hypothesis 1 posited that attachment avoidance and attachment anxiety would be positively associated with all subscales of GHQ-30 (high score means poor mental health). The correlation results generally supported this hypothesis and showed attachment anxiety was significantly and positively associated with all subscales of GHQ-30, whereas attachment avoidance was only positively associated with the subscale of Suicidal Depression.

Hypothesis 2 held that attachment avoidance and attachment anxiety would be negatively associated with identification to home culture and acculturation to host culture. However, only the negative correlation between attachment avoidance and identification to home culture was found in this study.

Hypothesis 3 posited that identification to home culture and acculturation to host culture would be negatively associated with all subscales of GHQ-30. We found mixed support for the two aspects of this hypothesis. Acculturation to host culture had no significant association with any of the subscales of GHQ-30, whereas identification to home culture was negatively associated with the subscales of Social Dysfunction and Suicidal Depression.

Hypothesis 4 held that there would be interactive effects between attachment orientations and acculturation modes on international students' GHQ-30. In order to examine this hypothesis, several

hierarchical multiple regression (HMR) analyses of GHQ-30 subscales were conducted. The number of years of residence in a host country and degree of proficiency in the host language have been found to influence the acculturation process (Miranda & Matheny, 2000; Sun, 2007). Therefore, we considered these two variables as controlling variables in the model, and entered them in the first step of the analysis. In the second step of the analysis, a block of four main variables was entered: attachment avoidance, attachment anxiety, identification with home culture, acculturation to host culture. The third step of the analysis examined interaction effects. Prior to this step, we standardized attachment orientations and acculturation modes into a Z score which had a mean of 0 and a standard deviation of 1 (Frazier, Tix, & Barron, 2004), and then created four interaction variables (Anxiety × Acculturation to host culture, Anxiety × Identification with home culture, Avoidance × Acculturation to host culture, and Avoidance × Identification with home culture). These interactive terms were entered together as a block in Step 3. The results of the HMR analyses are shown in table 10.2, table 10.3 and table 10.4.

Table 10.2 Hierarchical Multiple Regression Analyses of General illness and Somatic symptoms

Table 10.3 Hierarchical Multiple Regression Analyses of Sleep disturbance and Social dysfunction

Table 10.4 Hierarchical Multiple Regression Analyses of Anxiety and dysphoria and Suicidal depression

In the HMR analyses of subscales of GHQ-30, the length of stay in Japan positively predicted five subscales of GHQ-30, except for Social Dysfunction. Attachment anxiety predicted all subscales of GHQ-30, but attachment avoidance only predicted the subscale of Somatic Symptoms. Acculturation to host culture had no significant effect on any of the subscales of GHQ-30, whereas identification to home culture predicted the subscales of Social Dysfunction and Suicidal Depression. Chinese students who had a higher level of identification to home culture showed less social dysfunction and suicidal depression.

With regard to hypothesis 4, the interactive effects between attachment orientations and acculturation modes do not significantly explain the variance of any subscales of GHQ-30. However, the interactive effects between attachment avoidance and identification to home culture in General Illness and Suicidal Depression, and between attachment avoidance and acculturation to host culture on Social Dysfunction were significant. This showed that there was some possibility of the moderating effects of acculturation modes on attachment and GHQ-30.

To further discuss the relationships between the length of stay in Japan and six subscales of GHQ-30, multivariate analysis of variance was conducted. Firstly, the sample was divided into five groups according to the length of stay in Japan, which are less than six months, six months to one year, 1 year to 1.5 years, 1.5 years to 2 years, more than two years. Secondly, the MANOVA was used to examine

whether there are significant differences of the six subscales of GHQ-30 between these five groups. The result of multivariate analysis of variance was Wilks' Lambda = 0.70, F = 2.63, $p < .001$. The univariate analysis results were shown in table 10.5. The comparison of mean scores of six subscales of GHQ-30 for five groups was shown in Fig. 10.1. The results of MANOVA was consistent with the results of regression: individuals with different length of stay in Japan showed significant differences in all subscales of GHQ-30, except for social dysfunction; longer they stay in Japan, worse the mental health was.

Table 10.5 MANOVA results of six subscales of GHQ-30 by length of stay in Japan

Fig. 10.1 The comparison of mean scores of six subscales of GHQ-30 for five groups

4 Discussion

The primary objective of the present study was to examine the level of general mental health among Chinese students living in Japan from two theoretical perspectives: adult attachment theory and the acculturation process model. Five major findings were made.

First, our findings suggest that high attachment anxiety and avoidance were significant predictors for poor general mental health. Second, we found that high attachment avoidance was associated with low level of identification to home culture. Third, high identification to home culture was a significant predictor for good general mental health. Fourth, acculturation modes have some moderating effects on the relationships between attachment avoidance and some subscales of GHQ-30. Finally, the number of years that Chinese students have resided in Japan has a significantly positive association with GHQ30 subscales.

With regard to attachment, attachment anxiety predicted all subscales of GHQ-30, while attachment avoidance only predicted Somatic Symptoms. The effects of attachment avoidance were weaker than those of attachment anxiety. This difference between the two dimensions of attachment was also found in another study with Chinese students in the United States (Wang, 2009), in which attachment anxiety significantly predicted depressive symptoms, whereas attachment avoidance did not.

The length of stay in Japan was positively associated with poor mental health in the present study. Similar results were obtained in a longitudinal investigation of Chinese students in Japan, which found that the GHQ of Chinese students was higher after they had stayed in Japan for 4 months than after they had just arrived in Japan (Sun, 2007). According to the MANOVA analysis in the present study, we found that the status of mental health did not obviously changed during the initial 2 years staying in Japan, but after two years, the mental health significantly became worse. We can try to explain this result from two aspects. On one hand, acculturation is a two-way process. Migrants adapt and become integrated into the host country. Equally, the host society must accept them, and must itself change. It

has been argued that in contrast to the U.S. or European countries, Japan tends to stress its uniqueness and to view foreigners as a target for control and regulation, and that more effort is needed for Japan to become a tolerant multiethnic society (Bail, 2005; Sakanaka, 2011). If this is the case, Chinese students in Japan may feel more rejection from Japanese people and society with longer stay in Japan, which may hinder their acculturation process and have a negative impact on their mental health. In particular, their language problems became decreased and they can realize more Japan society after longer stay in Japan. On the other hand, Wang & Yokoyama (2009) suggested that the lack of friends, the academic difficulties and the anxiety with future development may influence the mental health of Chinese students in Japan. We consider the same factors may influence Chinese students' mental health in the present study. Longer stayed in Japan, Chinese students may meet more important changes or greater challenges. For example, the students in Japanese language school will generally finish their study in Japanese language school after 2 years. Before that, they have to prepare the applications and examinations of entrance, which will bring them great stress and influence their mental health. In another case, the graduate students have to prepare their thesis and find a job, which also may be the reasons that their mental health becomes worse.

Acculturation to the host culture is generally considered as protective for psychological adjustment (e.g., Zhang & Goodson, 2011; Yeh, 2003; Wang & Mallinckrodt, 2006). International students may be more willing to explore new surroundings and may adapt to the new culture more quickly when they identify with the host culture. However, in the present study, acculturation to Japan culture was not found to be associated with general mental health. The acculturation process for Chinese students in Japan may be more difficult than for students from other countries because of the historical problems between China and Japan. Acculturation to Japan culture may give rise to contradictory feelings in Chinese students, and result in them losing support from and acceptance by their culture and society of origin. If they feel fully accepted by Japanese society, their acculturation to Japanese culture may be a positive factor in their psychological adjustment. However, they may finally realize that they may never be fully accepted as a real member of this new society. At this time, the influence of acculturation to Japan may become complicated, because they pay the price of loss of support from and having to face misunderstanding and other negative attitudes from their family and culture of origin but cannot obtain corresponding acceptance by the new culture. This may explain why the present study found that acculturation to Japanese culture had no significant association with general mental health.

Table 10.1 Mean and standard deviations, and correlations among main variables

	M	SD	2	3	4	5	6	7	8	9	10	11	12
1.No. of Years of residence	1.20	1.28	.57**	-.04	.06	-.04	-.10	.30**	.34**	.27**	-.10	.34**	.29**
2. Japanese proficiency	3.68	1.25		-.02	-.03	.11	-.10	.23**	.26**	.18*	-.04	.25**	.19*
3. Attachment avoidance	3.76	0.69			.09	-.02	-.24**	.13	.14	.09	.05	.07	.17*
4. Attachment anxiety	3.42	0.99				-.02	-.03	.35**	.32**	.31**	.15*	.45**	.42**
5. Acculturation to host culture	4.06	1.00					.37**	.03	.02	.05	-.03	-.01	-.02
6. Identification with home culture	4.57	1.00						-.06	-.10	-.02	-.16*	.03	-.19*
7. General illness	6.12	3.29							.61**	.52**	.09	.64**	.48**
8. Somatic symptoms	3.99	3.79								.69**	-.03	.66**	.64**
9. Sleep disturbance	4.87	3.76									-.05	.66**	.56**
10. Social dysfunction	6.66	2.82										.09	.12
11. Anxiety and dysphoria	5.33	4.66											.70**
12. Suicidal depression	2.85	3.58											

Note. *p < 0.05, **p < 0.01

Table 10.2 Hierarchical Multiple Regression Analyses of General illness and Somatic symptoms

Hierarchical step/variable	General illness				Somatic symptoms			
	B	SE	β	ΔR^2	B	SE	β	ΔR^2
Step 1				0.09***				0.11***
No. of years of residence	.71	.26	.25**		.94	.30	.29**	
Japanese proficiency	.22	.24	.08		.23	.27	.08	
Step 2				0.13***				0.13***
No. of years of residence	.63	.25	.22*		.84	.28	.26**	
Japanese proficiency	.30	.23	.11		.29	.26	.10	
Attachment avoidance	.59	.36	.12		.78	.41	.14	
Attachment anxiety	1.05	.24	.31***		1.06	.27	.27***	
Acculturation to host culture	.27	.25	.08		.24	.29	.06	
Identification with home culture	- .09	.27	- .03		- .41	.30	- .11	
Step 3				0.03				0.01
No. of years of residence	.66	.25	.23**		.92	.29	.28**	
Japanese proficiency	.29	.23	.11		.25	.26	.08	
Attachment avoidance	.62	.39	.13		.88	.44	.16*	
Attachment anxiety	.94	.25	.28***		.95	.29	.24**	
Acculturation to host culture	.33	.27	.10		.32	.31	.08	
Identification with home culture	- .11	.29	- .03		- .52	.33	- .13	
Avoidance × Home culture	- .54	.27	- .15*		- .28	.30	- .07	
Avoidance × Host culture	.32	.27	.09		- .14	.31	- .03	
Anxiety × Home culture	- .15	.23	- .05		- .26	.27	- .08	
Anxiety × Host culture	.26	.22	.09		.22	.25	.07	

Note. *p < 0.05, **p < 0.01, ***p < 0.001

Table 10.3 Hierarchical Multiple Regression Analyses of Sleep disturbance and Social dysfunction

Hierarchical step/variable	Sleep disturbance				Social dysfunction			
	B	SE	β	ΔR^2	B	SE	β	ΔR^2
Step 1				0.08**				0.01
No. of years of residence	.87	.29	.27**		- .27	.23	- .11	
Japanese proficiency	.01	.27	.00		.03	.21	.01	
Step 2				0.10**				0.07*
No. of years of residence	.79	.28	.25**		- .34	.23	- .14	
Japanese proficiency	.06	.26	.02		.02	.21	.01	
Attachment avoidance	.34	.42	.06		- .25	.34	- .06	
Attachment anxiety	1.03	.28	.27***		.48	.22	.17*	
Acculturation to host culture	.42	.29	.11		.13	.23	.05	
Identification with home culture	- .21	.31	- .06		- .60	.25	- .21*	
Step 3				0.02				0.05
No. of years of residence	.84	.29	.26**		- .38	.23	- .15	
Japanese proficiency	.05	.27	.02		.02	.21	.01	
Attachment avoidance	.60	.45	.11		- .54	.36	- .13	
Attachment anxiety	.96	.29	.25**		.51	.23	.18*	
Acculturation to host culture	.40	.31	.11		.12	.25	.04	
Identification with home culture	- .16	.33	- .04		- .62	.27	- .22*	
Avoidance × Home culture	- .47	.31	- .12		.10	.24	.03	
Avoidance × Host culture	- .23	.32	- .06		.64	.25	.20*	
Anxiety × Home culture	.01	.27	.00		- .10	.22	- .04	
Anxiety × Host culture	.13	.26	.04		- .16	.20	- .07	

Note. *p < 0.05, **p < 0.01, ***p < 0.001

Table 10.4 Hierarchical Multiple Regression Analyses of Anxiety and dysphoria and Suicidal depression

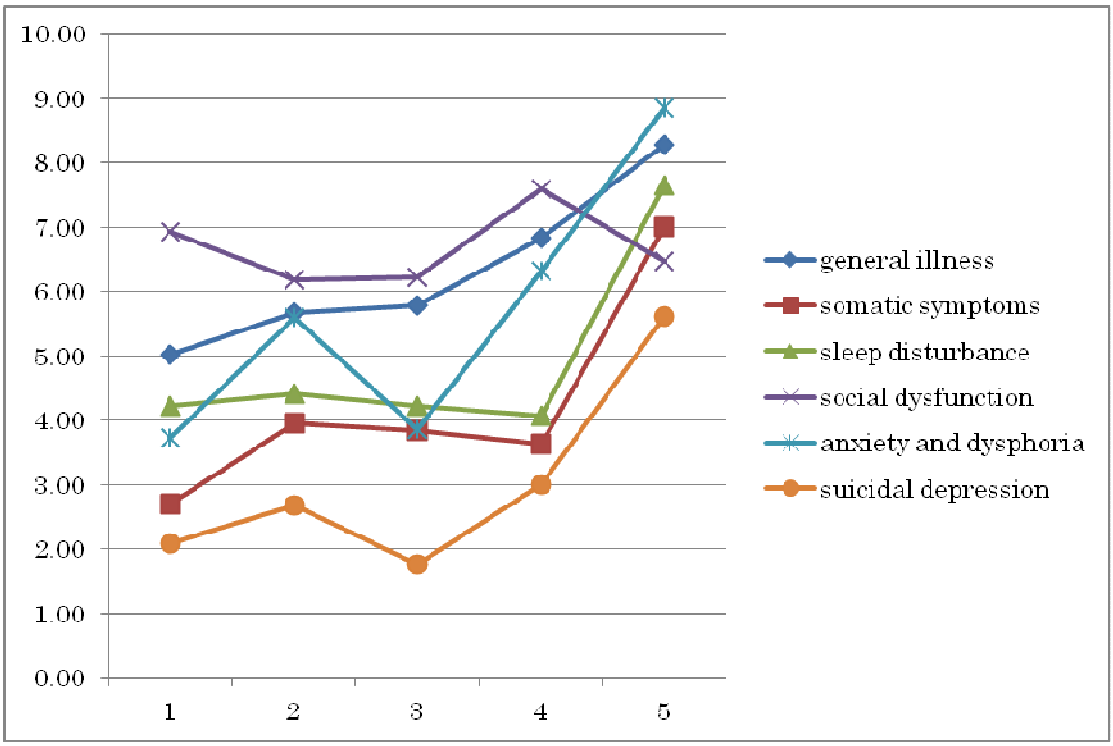
Hierarchical step/variable	Anxiety and dysphoria				Suicidal depression			
	B	SE	β	ΔR^2	B	SE	β	ΔR^2
Step 1				0.12***				0.08**
No. of years of residence	1.18	.34	.31**		.81	.28	.26**	
Japanese proficiency	.16	.31	.05		.07	.26	.03	
Step 2				0.16***				0.22***
No. of years of residence	1.01	.31	.27**		.67	.25	.22**	
Japanese proficiency	.35	.29	.10		.13	.23	.05	
Attachment avoidance	.33	.46	.05		.45	.37	.09	
Attachment anxiety	1.76	.31	.39***		1.38	.24	.39***	
Acculturation to host culture	.03	.32	.01		.33	.26	.09	
Identification with home culture	.19	.34	.04		- .72	.27	- .20**	
Step 3				0.01				0.03
No. of years of residence	1.01	.32	.27**		.73	.25	.24**	
Japanese proficiency	.35	.29	.10		.09	.23	.03	
Attachment avoidance	.26	.50	.04		.51	.39	.10	
Attachment anxiety	1.75	.32	.39***		1.27	.25	.35***	
Acculturation to host culture	- .06	.35	- .01		.28	.27	.08	
Identification with home culture	.23	.37	.05		- .77	.29	- .21***	
Avoidance × Home culture	- .27	.34	- .06		- .53	.27	- .14*	
Avoidance × Host culture	.42	.35	.09		.20	.27	.05	
Anxiety × Home culture	- .11	.30	- .03		- .34	.24	- .11	
Anxiety × Host culture	- .24	.29	- .07		- .09	.22	- .03	

Note. *p < 0.05, **p < 0.01, ***p < 0.001

Table 10.5 MANOVA results of six subscales of GHQ-30 by length of stay in Japan

GHQ-30	F	-0.5 years (59)		0.5-1 year (22)		1-1.5 years (43)		1.5-2 years (25)		2- years (29)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
general illness	5.75***	5.02	2.60	5.68	3.14	5.79	3.46	6.84	3.40	8.28	3.45
somatic symptoms	7.15***	2.69	3.15	3.95	4.18	3.84	3.42	3.64	4.10	7.00	3.65
sleep disturbance	5.94***	4.22	3.57	4.41	3.19	4.23	3.34	4.08	3.28	7.66	3.80
social dysfunction	1.26	6.93	3.23	6.18	3.00	6.23	2.62	7.60	2.27	6.48	2.47
anxiety and dysphoria	9.27***	3.73	3.88	5.59	4.28	3.86	3.68	6.32	4.77	8.86	4.47
suicidal depression	7.12***	2.08	3.22	2.68	3.09	1.77	2.91	3.00	4.78	5.62	2.43

Note. The number of students in the group was written in the brackets.



1: less than 0.5 years; 2: 0.5-1 year; 3: 1-1.5 years; 4: 1.5-2 years; 5: more than 2 years

Fig. 10.1 The comparison of mean scores of six subscales of GHQ-30 for five groups

Part V Conclusions

Chapter 11: Conclusions of study

The present study examined the relationships between attachment and mental health from three perspectives: personality traits and personality deviations, the mediating effects of self-esteem and coping, and cultural influences.

1 Attachment and personality traits, personality deviations

With regard to the relationship between attachment and personality traits/personality deviations, several main conclusions can be made:

(a) There were significant positive correlations between insecure attachment pattern and maladaptive personality pattern; secure attachment pattern and adaptive personality pattern: high anxiety, low depend and close were significantly correlated with high nervosity, low extroversion and agreeableness for the male group; low anxiety, high depend and close were correlated with low nervosity, high extroversion and agreeableness for the female group.

(b) There was a significant correlation between the Close dimension of the AAS and a submissive personality pattern: high close was correlated with low extroversion and high agreeableness for the female group.

(c) Individuals with secure attachment styles were significantly positively correlated with social and cooperative, and negatively correlated with the personality traits of introversive, inhibited and sensitive and PI; individuals with insecure attachment styles were significantly negatively correlated with social and cooperative, and positively correlated with the personality traits of introversive, inhibited and sensitive and PI.

(d) Individuals with severe personality deviations (Schizoid, Cycloid and Paranoid personality disorder) showed significant differences to normal individuals on the Anxiety and Close dimensions of the AAS: individuals with severe personality deviations had higher anxiety and lower close.

2 Mediating effects between attachment and mental health

With regard to mediating effects on attachment and mental health, self-esteem strongly mediated the relationships between the two attachment instruments and the three subscales of GHQ-20. High avoidance and anxiety attachment were negatively associated with self-esteem, and low self-esteem predicted a low sense of adequacy, high depression and anxiety. High close and depend of AAS were positively associated with high self-esteem, and this predicted a high sense of adequacy. In contrast to this, high anxious of AAS is negatively associated with self-esteem, and low self-esteem predicted high depression and anxiety of GHQ-20.

In addition, the mediating effects of coping between attachment and quality of life were also found.

Negative coping mediated the link between attachment anxiety and quality of life; positive coping mediated the link between attachment avoidance and quality of life. Students with insecure attachment, when faced with a stressful situation, tended to select negative coping and avoided positive coping, which resulted in poor quality of life.

3 Attachment and cultural influences

Finally, this study also examined the cultural influences on attachment and mental health through (a) comparing the results of Japanese students and Chinese students, and (b) examining the relationships among attachment, acculturation and mental health for Chinese students in Japan.

Comparison of the two cultural groups showed that the Chinese students had better general mental health compared to the Japanese students. Attachment avoidance in the Japanese students was higher compared to the Chinese students, whereas the attachment anxiety of the Chinese students was higher than that of the Japanese students. In addition, the findings also suggest that significant cultural differences exist in the mediating models. The Chinese students utilized a combination of positive coping responses, such as the use of instrumental support, and negative ones, such as behavioral disengagement. In contrast, the Japanese students tended to select negative personal-orientated strategies, such as substance abuse, self-blame and denial.

With regard to acculturation, there were five major findings. First, high attachment anxiety and avoidance were significant predictors for poor general mental health. Second, high attachment avoidance was associated with a low level of identification to home culture. Third, high identification to home culture was a significant predictor for good general mental health. Fourth, acculturation modes had some moderating effects on attachment avoidance and some subscales of GHQ-30. Finally, the number of years that Chinese students have resided in Japan had a significant positive association with GHQ30 subscales.

The above is the findings of the present dissertation. These findings suggest that there is a complex mechanism between attachment and mental health. Attachment influences individuals' mental health in many ways, including personality, self-esteem, coping with stress, and cultural factors in the present studies. When we think to improve individuals' mental health or treat patients with attachment theory, we have to consider more other influential factors.

Chapter 12: Study implications and limitations

1 Study Implications and Future Directions

The present study has several implications for psychological education and counseling practices, as well as several research implications.

First, given the strong correlation between attachment and personality traits/personality deviations, it is important for schools and parents to promote and strengthen parent-child relationships to facilitate the development of children's adaptive personality. For example, school counselors may provide psychological education for parents whose children have interpersonal or academic problems, to help them build better attachment relationships.

Second, when faced with the choice between adaptive and maladaptive coping responses, students' preferences depend on the nature of attachment. For example, the results suggest that students with insecure attachment were more likely to avoid positive coping and engage in behaviors that are not helpful in reducing stress or solving problems and difficulties. From this perspective, the findings of the present study can be helpful to school psychologists because one important issue they are required to deal with is how students cope with stress. Counselors can use the ECRS with their student clients to explore their attachment orientations and predict their selection of coping responses. This will help facilitate an appropriate selection of interventions and counseling goals given the students' adult attachment orientation (Lopez et al., 2001).

Furthermore, this study also has implications for evaluation of, intervention in, and treatment of mental illness among foreigners in Japan, especially with regard to improving the level of mental health among Chinese students in Japan. The findings highlight the influence of attachment and acculturation on general mental health. In other words, the initial clinical evaluation should assess adult attachment, acculturation, and other factors that are related to general mental health, such as the length of stay in Japan. Furthermore, the roles of these factors, the migration experience, and changes in the acculturation process are issues that should be explored throughout the course of treatment.

The present study also has several research implications. It provided a systematic perspective to explore the mechanism between attachment and mental health, through connecting to personality development theory, cognitive and behavioral system, and cultural perspective, and measuring both the positive and negative aspects of mental health.

In details, study 1 provided a new perspective to examine the relationships between attachment and personality, personality deviations by using PACL, which addressed that normal personality and abnormal personality shared the common nature and structure. Study 2 was a new exploration in Chinese populations to examine the mediating effects of self-esteem between attachment and mental

health. Furthermore, although structures of attachment in ECRS have been widely approved by researchers, the further discussion is still necessary to clarify the underlying structures of attachment because of the production of comparison between the two attachment instruments. Study 3 expanded the knowledge of the mediating effects of coping between attachment and mental health with a Japanese sample, and showed the necessity to investigate different indicators of mental health together.

A lot of research studied the nature of Japanese sample or Chinese sample, or compared some aspects of the two groups, but few explored the nature of attachment through comparing these two groups. However, it may be necessary because there are many differences between these two cultures in some aspects, such as family structure, education, and parenting behaviors. Study 4 filled the gap to compare the relationships between attachment and other variables using Japanese and Chinese samples. Study 5 showed that different to traditional studies conducted with Asian-American samples, the acculturation process in Japan is special for Chinese students, which suggested that more research should be investigated to obtain more information about the acculturation process in Japan for Chinese samples.

Future studies employing longitudinal designs are needed to show whether our focal predictors were responsible for the change in mental health. The change in mental health over time is more informative for interventions than the absolute health level at a given time (Ying & Liese, 1991). Future research studies may incorporate qualitative methods in order to get a more in-depth perspective on how the coping progress and acculturative progress occurred when attachment was activated. Qualitative data may also help to test new hypotheses and identify new variables involved in attachment and their relationships to psychological outcomes. In addition, it will also be necessary to collect information from participants' parents, teachers, and peers, in order to get a more multidimensional perspective on attachment. For example, parents' adult attachment and parenting behaviors should be added to the research so that we can discuss the possible common mechanism of development of attachment and personality.

2 Study limitations

The present dissertation was composed of two preparative studies and five studies to explore which factors affect attachment and mental health, and how these factors operated. Therefore, it provided a systematic perspective to deeply understand the underlying mechanism between attachment and mental health.

However, this study had several limitations that warrant discussion. The first limitation was that the size of the sample in study 1 was not large enough to obtain an adequate number of subjects with personality deviations, which therefore limits the statistical power of the analysis of attachment and

personality deviations. This disturbs us to explore the interface between personality traits and personality deviations and its relationships to attachment. The second limitation was that we utilized non-probability samples which came from universities in the capital cities of Japan and China. Our results cannot be generalized to college students from all regions of Japan and China, before they are replicated in those populations. Third, the participants in study 5 had lived in Japan for an average of 1.2 years. As such, there could be less variance on acculturation than in U.S. samples, which often represent a great number of years of residence. Fourth, we were not able to make causal statements based on our cross-sectional design. Finally, this study relied solely on the use of self-report questionnaires. This form of research has some limitations in that it does not take into account the ecological context of the participants' lives and the views of other relevant groups such as their family, school teachers and peers (Yeh et al., 2008). Self-report measures are also more susceptible to social desirability bias.

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