Relationship Differences in Anger Responses: The Roles of Approach and Avoidance Motives

YOU, Jin

A Thesis Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

in

Psychology

The Chinese University of Hong Kong

August 2010

Supervisor:

Prof. Helene H. L. Fung

Submission date:

August 2010

Thesis/Assessment Committee

Professor Fanny M. Cheung (Chair)
Professor Helene Hoi-lam Fung (Thesis Supervisor)
Professor Takeshi Hamamura (Committee Member)
Professor Charles Ching-hai Chan (External Examiner)

Abstract of thesis entitled:

Relationship Differences in Anger Responses: The Roles of Approach and Avoidance Motives

Submitted by Jin You
for the degree of Doctor of Philosophy in Psychology

Emotion theories from social and functionalist perspectives have greatly emphasized the importance of relationship contexts for emotions (Carolyn; 2004; Lazarus, 1991), yet relatively few empirical efforts have been spent on exploring whether and how individuals differentially deal with anger under different relationship contexts. Study 1 investigated how individuals' anger responses might vary with relationship contexts across cultural contexts. Two hundred and sixty-six participants from America, Hong Kong and Mainland China reported their responses toward anger-eliciting scenarios that were elicited by a kin, a close or a casual friend. Results indicated that, after controlling for demographic variables, personality, and relationship qualities, individuals displayed a higher level of direct and replaced aggression but a lower level of cognitive reappraisal and indirect aggression in kinship than in the two types of friendships across the three samples. While Hong Kong Chinese displayed a higher level of fractious motives in kinship than in two types of friendships, Mainland Chinese displayed a lower level of malevolent motives in kinship than in two types of friendships.

To resolve the controversy between two interpretations for the above relationship effect on anger response, we conducted an experiment to examine the

roles of approach and avoidance motives in determining relationship effects on anger responses in Study 2. One hundred and fifty two Hong Kong Chinese female participants' anger responses during emotion recalling tasks were assessed in terms of subjective feeling, physiological arousal and facial expression, after approach and avoidance motives were manipulated. Results revealed that, even after controlling for relevant personality traits, demographic variables, and relationship qualities, individuals displayed a higher level of anger-related subjective feeling and facial expression in kinship than in friendship. Such relationship effects were reversed and disappeared when approach and avoidance motives. In addition, we found that approach motives reduced individuals' sympathetic activation to anger-eliciting events in kinship, and avoidance motives lowered individuals' parasympathetic activation to happy events in friendship. The above findings have great implications for anger regulation and health promotion under relationship contexts.

Abstract of thesis entitled:

Relationship Differences in Anger Responses: The Roles of Approach and Avoidance Motives

Submitted by Jin You
for the degree of Doctor of Philosophy in Psychology

情緒的社會和功能論者強調了關係背景對情緒的重要性，但是少有研究詳細考察個體究竟如何在不同的關係背景下應對自己的憤怒。研究一旨在揭示來自不同文化的個體在不同關係背景下如何應對憤怒。二百六十六名來自美國、香港、內地的被試報告了自己對親人、好朋友和普通朋友引起的憤怒事件的反應。結果表明，在控制了性別、相關人格變數和關係品質後，個體在親人關係中比在兩種朋友關係中表現出了更多的直接和替代攻擊和更少的認知評估。與此同時，香港年輕人在親人關係中比朋友關係報告了更高的發脾氣動機；內地年輕人在親人關係中報告了低於朋友關係的報復動機。

爲了澄清已有文獻對上述關係效應解釋的不一致，我們在研究二完成了一項實驗研究，考察了趨近和回避動機對上述關係效應的影響。我們從主觀感受、生理喚起和面部表情三個方面評定了一百五十二名香港女大學生在回憶情緒事件時的反應。結果發現，即使控制了相關人口學和關係變數後，個體在親人關係中比在朋友關係中報告了更高水準的憤怒情緒體驗和面部表情。當趨近和回避動機被操縱的時候，上述關係效應消失或者被改變呈相反的方向。此外，我們發現，趨近動機可以降低個體對親人關係中憤怒事件的交感神經系統喚起；回避動機可以降低個體對朋友關係中快樂事件的副交感神經系統喚起。上述結果對理解關係情景中的憤怒調節和健康提升有重要的意義。

Acknowledgment

I would like to express my deep appreciation to my supervisor, Professor Helene Fung for her valuable advice, supports, encouragement, and care throughout the past three years' study. I would also like to thank my committee members, Professor Fanny Cheung and Professor Takeshi Hamamura, as well as my external examiners. With all their insightful suggestions for my dissertation, I would not have been able to finish this project.

My appreciation also goes to Mr. Tze Chau Chiu and technical support tream from Mindware Company for their patient and warm-hearted technical supports. In addition, I would like to thank my participants. Without their active participation and open-minded attitudes, it would be extremely difficult to conduct such a complicated physiological experiment with "numerous" sensors attached to the body.

Finally, I would like to thank my labmates, classmates and family member for accompanying me and providing various forms of helps with both study and life. Without their encouragements and helps, I would not have overcome the difficult times and enjoyed such a meaningful and joyful life.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Anger is an important feeling in daily life, but it always poses a dilemma for us. On the one hand, if we express anger, it may be the fatal killers for social functions and well-being. Increasing evidence shows that overt anger has resulted in decreased self-esteem, negative other evaluation, relationship conflicts, property loss, occupational dysfunction, aggression and even violence (Deffenbacher, 1992). On the other hand, if we suppress anger, it may also come at the costs of physical health. Anger, particularly suppressed anger, was found to be an independent risk factor for physical symptoms including hypertension, coronary heart disease and mortality (T. Q. Miller, Smith, Turner, Guijarro, & Hallet, 1996; Smith, 1992; Spielberger, et al., 1991). As such, it is of particular importance to find out how to regulate anger at the lowest expense.

Although anger is important for personal health and social security, it has not received as much attention as other negative emotions like depression and anxiety from researchers (Kassinove, 1995). Among a limited number of existing studies, anger is mainly analyzed at the cognitive, physiological, and behavioral levels with an underlying assumption that emotions reside within individuals' body or mind (Averill, 1983; Lazarus, 1991). Yet, from social and functional perspectives, emotions cannot be completely understood without considering social contexts under which it occurs. As Rothbart (1994) argues, "From the earliest days, emotion is regulated by others, and many of our emotions and cognitions about emotions [are]

developmentally shaped in a social context" (p. 371). Given that little effort has so far been put into investigating social aspects of anger, this study aims to fill in the gap by exploring how and why anger responses may vary with relationship contexts.

In the following parts of thesis, I first reviewed existing literatures from Chapter 2 to Chapter 5. Chapter 6 briefly introduced two studies included in the present thesis. Chapter 7 and Chapter 8 described two studies we conducted in this research project. Finally, Chapter 9 provided a general discussion about the findings of two studies in this thesis.

CHAPTER 2: ANGER AS A MULTI-COMPONENTIAL CONSTRUCT

Componential perspective of emotion conceptualizes emotions as multifaceted phenomena, including systematical changes in subjective feeling, physiological activation, and expressive behaviors (Izard, 1991; Mauss, Bunge, & Gross, 2008). Appraisal theory (Scherer, 1984) adds that cognitive reappraisal is another important component of emotion. In a similar manner, anger theorists also define anger as "a negative phenomenological (or internal) feeling state associated with specific cognitive and perceptual distortions and deficiencies (e.g. misappraisals, errors, and attritions of blame, injustice, preventability, and/or intentionality), subjective labeling, physiological changes, and action tendencies to engage in socially constructed or reinforced organized behavioral scripts" (Kassinove, 1995).

Anger as a high-arousal negative emotion

Specific to subjective feeling, anger has consistently been found to lie in the octant of affective circumplex that is high in both negative valence and arousal level (Russell, 1980; Russell, Lewicka, & Niit, 1989). Russell (1980) investigated the structure of affective experience both by analyzing participants' affective states in daily life and by asking participants to judge the similarities among different emotional adjectives. Results indicated that anger-related affective terms (e.g. angry, annoyed) consistently fell at the negative extreme of the pleasant-unpleasant dimension and the high-arousal extreme of the arousal dimension. Using exactly the same procedures, the above findings obtained from English-speaking student sample were replicated in Estonian, Greek, Polish, and Chinese samples (Russell, et al., 1989;

Yik & Russell, 2003). More explicitly, a recent affect theory, the Affect Valuation Theory (Tsai, 2007) divided affects into 8 categories: positive affects, low-arousal positive affects, low arousal affects, low-arousal negative affects, negative affects, high-arousal negative affects, high-arousal affects and high arousal positive affects, and conceptualized anger as a typical high-arousal negative affects. Such conceptualization was confirmed with factor analysis technique across both Eastern and Western samples (Tsai, Knutson, & Fung, 2006).

Physiological arousal of anger

Physiological studies, with various emotion eliciting and assessing techniques, have also revealed an anger-specific pattern of physiological arousal, particularly cardiovascular reactivity. Levonson and his colleagues (Ekman, Levenson, & Friesen, 1983; Levenson, 1992) consistently found that anger elicited by directed facial action task was associated with a greater increase in heart rate and finger temperature but a lower decrease of skin conductance from baseline. When participants were asked to recall an anger-eliciting event, significant increases from baseline have been revealed in heart rate (Marci, Glick, Loh, & Dougherty, 2007; Ratnasingam & Bishop, 2007), blood pressure (Ratnasingam & Bishop, 2007; Why & Johnston, 2008) and skin conductance (Tsai, Chentsova-Dutton, Friere-Bebeau, & Przymus, 2002). In several recent film studies, watching anger-eliciting films were found to produce a greater decrease in mean successive difference but a less increase in heart rate and skin conductance than did induced happiness (Christie & Friedman, 2004; Tsai, Levenson, & Carstensen, 2000). In harassing laboratory tasks, anger elicited by experimenters'

harsh behavior was found to predict the increases in heart rate, mean arterial blood pressure, cardiac output, peripheral sympathetic activation but the decreases in ventricular contractility, pre-ejection period (Mauss, Cook, Cheng, & Gross, 2007; Mauss, Cook, & Gross, 2007; Ray, Wilhelm, & Gross, 2008). A study compared anger-related physiological reactivity elicited by film, stressful interview, punishment, and harassment and revealed significant increases in blood pressure and skin conductance during harassment and stressful interview and a significant increase in heart rate during harassment (Lobbestael, Arntz, & Wiers, 2008). More interestingly, several studies based on biopsychosocial model have consistently confirmed that appraising anger-evoking events as threats and challenges can result in differential patterns of physiological responses (Blascovich, 2008; Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001). When anger-eliciting events were appraised as threats, anger was accompanied with no change in cardiac output but an increase in total peripheral resistance from baseline; when anger-eliciting event were appraised as challenges, anger was accompanied with an increase in cardiac output and a decrease in total peripheral resistance from baseline.

Behavior expression of anger

Anger is also associated with a specific pattern of facial expression and other behavioral reactions. Facial action coding system revealed that anger was characterized by lowered eyebrows, pressed lips and widened eye aperture across cultural contexts (Ekman & Friesen, 1978). In emotion recognition tasks, the distinctive features of anger also included eyebrow lowering, upper lids raising, and

lower lip pressing (Kohler, et al., 2004). More obviously, anger was also expressed through various aggressive and violent behaviors (Huesmann, 1998). For instance, among a set of anger-eliciting interpersonal scenarios, 50% of them evoked verbal and symbolic aggression, and 82% evoked a tendency to show verbal aggression; 10% led to direct physical aggression, and 40% evoked individuals' tendency to show physical aggression (Averill, 1983).

Cognitive appraisals of anger

Anger is also associated with a unique pattern of cognitive appraisals like the frustration or goal obstruction. Appraisal theory (Ortony, Clore, & Collins, 1988) posits that the elicitation of anger is predicted by the displeasure or disapproval, which is in turn transformed into anger by blaming others. This idea is confirmed by findings from several recent studies. For instance, a study on cognitive appraisal of anger showed that anger was predicted by frustration, unfairness, and other accountability (Kuppen, Mechelen, Smit, & De Boeck, 2003). Another study further revealed that frustration, other accountability, and hostile intentions served as sufficient conditions for anger provocation (Van Mechelen & Hennes, 2009). In particular, frustration or goal thwarting was the central appraisals for anger elicitation (Kohler, et al., 2004).

As reviewed above, anger in general has been assumed as an internal emotional state that resides within our mind and body. At more conscious level, when situations are appraised as frustrated, other-blamable or goal thwarting, anger occurs accompanied by highly aroused negative feelings and even various forms of

aggressive behaviors. At more unconscious level, anger is also coupled with heightened sympathetic arousal like increased heart rate and cardiac output.

CHAPTER 3: ANGER RESPONSES UNDER Different RELATIONSHIP CONTEXTS

Although literatures reviewed above assume anger as a internal emotional state, emotion theories from social and functionalist perspectives have converged on the idea that anger, similar to other emotions, is social in nature (Manstead, 2005). First, as appraisal theory suggests, emotions are defined by social contexts in various manners (Frijda, Ortony, Sonnesman, & Clore, 1992). A prototype analysis of layperson's description about emotion showed that 75% of emotions described peoples' relationships with others (Shaver, Wu, & Schwartz, 1992). Lazaurs (1991) argued that emotions were the terms that abstractly summarized the benefits and losses in specific social relationships. Second, functionalist perspective of emotions suggests that emotions are communicative and convey unique social information under interpersonal contexts (Carolyn, 2004). For instance, anger was argued to reflect individuals' efforts to restore the world to right or to maintain autonomy, but may also be disruptive to relationship harmony and closeness (Ellis & Malamuth, 2000; Tiedens, 2001). More importantly, such arguments regarding social nature of anger are supported by increasing evidence from Western literatures on anger. In the four sections that follow, I reviewed findings from prior studies about how each of four anger components varied with relationship contexts.

Effects of relationship context on subjective feeling of anger

At the affective level, individuals experience more frequent and more intense anger in familiar relationships than in unfamiliar relationships. A survey investigating

anger in the daily life of college students showed that more than 50% of anger-eliciting events occurred in familiar relationships, but only 25% of them occurred in unfamiliar relationships (Averill, 1983). A study on children indicated that children tended to experience higher and more frequent anger in friendships than in relationships with disliked classmates and such relationship differences in anger showed an increasing tendency with age (Sumrall, Ray, & Tidwell, 2000). Replicating these findings in college student samples, younger adults were found to report more intense hurtful feelings when they were hurt by family members than by other relationship partners, and this effect remained even after controlling for relationship qualities (Vangelisti & Crumley, 1998). Similarly, when being angered by partners, younger adults tended to report greater negative emotions and high-arousal emotions in romantic relationships than in friendships (Fehr & Harasymchuk, 2005).

Effects of relationship context on anger-related behaviors

Findings from research on anger-related behaviors show that individuals tend to display more direct emotion expressive behaviors in familiar relationships than in unfamiliar relationships. A study on anger expression revealed that women tended to express their anger more at home than at work and at leisure (Bongard & al' Absi, 2003). Findings from studies on emotion expression also showed that individuals tended to express emotions in familiar relationships but suppress negative emotions in unfamiliar relationships. For instance, individuals were found to express both positive and negative emotions in communal relationships, but suppress negative

emotions in weak communal relationships (Clark & Finkel, 2004; Clark, Fitness, & Brissette, 2001).

Meanwhile, findings from several other studies suggest that individuals display more direct and less indirect anger-related behaviors in familiar relationships than in unfamiliar relationships. For instance, a study on aggression found that individuals tended to display more physical aggression and less reasoning strategies with family members than with friends during interpersonal conflicts (Dunn & Herrara, 1997). Research on problem solving showed that adolescents developed more diverse and effective strategies to handle interpersonal problems with friends than with acquaintances (Caplan, Bennetto, & Weissberg, 1991). Several other studies showed that friends tended to deal with dissatisfactory events with indirect and passive strategies (e.g. neglect, avoidance); whereas romantic partners tended to explicitly respond to dissatisfactory events with active strategies (e.g. discussion, exit) (Boxter, Wilmot, Simmons, & Swartz, 1993; Drigotas, Whitney, & Rusbult, 1995).

Effects of relationship context on anger-related cognitive processes

Relationship context also serves as a backdrop for anger-related cognitive processes. For instance, children reported that it was less acceptable to be aggressive toward best friends than toward siblings and causal friends (Sirrine, Lauricella, & Saveliev, 2005). Children and adolescences tended to attribute in less hostile way and to positively evaluate the relationship partner when being offended by a friend than by a disliked peer (Peets, Hodges, Kikas, & Salmivalli, 2007; Sumrall, et al., 2000). Younger adults clearly realized that they would receive more benefits and fewer risks

when expressing negative emotions in communal relationships than in exchange relationships (Clark & Finkel, 2004). They were able to explicitly expect that hurts or aggression toward dating partners had greater deleterious consequences on their dating relationships than on their relationships with family members (Goldstein & Tisak, 2004; Vangelisti & Crumley, 1998).

Effects of relationship context on anger related physiological arousal

Importantly, there has been some evidence suggesting that physiological arousal of anger can also be shaped by relationship contexts. Bongard and al' Absi (2003) found that anger expression at work, but not at home or at leisure, predicted an increase in blood pressure; whereas anger control at work, but not at home or at leisure predicted a decrease in blood pressure. Further work of this study assessed both general anger expression (the tendency of expressing anger across all contexts) and anger expression at work, at home as well as at leisure; results indicated that context-specific anger expression was a better predictor for blood pressure than was general anger expression (Bishop, Ngau, & Pek, 2008).

In addition, indirect evidence has been obtained from physiological studies on social relationships. First, experimental studies on social support reveals that supports from familial relationships had greater beneficial effects on physiological functions than did those from non-familial relationships. For instance, some studies showed that social support from family members can lower individuals' cardiovascular arousal to a greater extent relative to those from strangers (Edens, Larkin, & Abel, 1992; Snydersmith & Cacioppo, 1992). Second, studies on daily

interaction found that positive interaction experience in kinship has a unique "calming" effect on physiological arousal. Findings from a diary study found that interaction with family members predicted a lower level of ambulatory blood pressure, but interaction with ambivalent relationship partners (high in both positive and negative feelings) predicted the highest ambulatory blood pressure relative to all other relationships. A study on hypertensive patients indicated that staying with family members predicted a greater decrease in patients' cardiovascular reactivity like blood pressure compared to staying with friends and strangers (Spitzer, Liabre, Ironson, Gellman, & Schneiderman, 1992).

Explanations to relationship effect on anger

Findings from prior studies show that individuals tend to show more anger and more direct anger-related behaviors in familiar relationships (e.g. kinship) than in unfamiliar relationships (e.g. friendship). With respect to why such relationship effect occurs, there are mainly two interpretations in existing anger literatures. The first interpretation emphasizes individuals' efforts to avoid conflicts and hurts in familiar relationships. The second interpretation greatly emphasizes the security of freely expressing anger in familiar relationships.

The first interpretation is mainly proposed by emotion-in-relationship model (Berscheid & Ammazzalorso, 2001). According to this theoretical model, individuals had higher expectation in closer relationships (e.g. kinship), and thus tended to experience more intense anger when their expectations were not met. In parallel, Vangelisti and her colleagues (Vangelisti & Crumley, 1998; Vangelisti & Maguie,

2002) argued that individuals had made greater investment to familiar relationships and thus such relationships were much harder to be replaced. As such, hurts from familiar partners may signal greater losses of investment, and thus evoked stronger hurtful feelings.

The second interpretation is mainly proposed by cross-cultural researchers. Specifically, Matsumoto (Matsumoto, Yoo, & Chung, 2009) argued that individuals had a higher tendency to express anger toward in-group members than toward out-group members because they believed that anger expression among in-group members, due to the long history of interaction, would never mean they intended to hurt each other. Similarly, other researchers (Wellman, Yuk-Lin Wong, Tindall, & Nazer, 1997) posited that due to involuntary nature and long history, familiar relationships were more interdependent and struck together, and thus individuals would never let a signal interaction hurt their relationships. As such, free anger expression is allowed in familiar relationships than in other relationships.

Although both interpretations seem to be reasonable, they have totally opposite assumptions about the underlying motivations. The first interpretation assumes the greater anger responses occur in familiar relationships because they believe that familiar relationship partners' hurtful behaviors violate their expectation about what partners ought to do to a greater extent or signal greater loss of investment. In this sense, individuals seem to emphasize negative outcomes (e.g. loss of investment, violation of expectation) more in familiar relationships than in unfamiliar relationships. In contrast, the second interpretation assumes that anger expression

would hurt familiar relationships less than unfamiliar relationships, but may improve relationships through better communication and mutual understanding. In this sense, individuals may emphasize positive outcomes (e.g. relationship promotion) more and negative outcomes (e.g. hurt) less in familiar relationships relative to unfamiliar relationships.

To sum up, findings from prior studies in general supported the arguments from social and functionalist perspectives, which posit that emotional responses are greatly shaped by relationship contexts (Carolyn, 2004; Lazarus, 1991). That is, individuals displayed more intense anger in familiar relationships than in unfamiliar relationships. Such relationship effect on anger has been interpreted in terms of relationship difference in motivations to avoid conflicts or to promote relationships. Yet, it still remains an unanswered question regarding how relationship difference in anger might be driven by approach-avoidance motives. In the following two chapters, I carefully reviewed literatures on approach and avoidance motives and emotional consequences.

CHAPTER 4: APPROACH AND AVOIDANCE MOTIVES AS PREDICTORS FOR EMOTIONAL CONSEQUENCES

The above inconsistency between these two interpretations in terms of motivation is well captured by the distinction between approach and avoidance motives in social psychology. Building on early work on motives for advancement and security (Maslow, 1955; Rogers, 1961), approach and avoidance motives (or promotion- and prevention- focused goals) have become the most important distinction in several recent motivational theories. Approach motives are concerned with the strivings for rewarding and desired end states; whereas avoidance motives are concerned with the strivings for the avoidance of punishing and undesired end states (Carver & Scheier, 1990; Elliot & Church, 1997; Gray, 1990). In similar way, promotion-focused goal pursuits focus on attainment and advancement, which involves the strivings for hopes, rewards and ideals; prevention-focused goal pursuits focus on maintenance and security, which involves the fulfill of ought, responsibilities and obligations (Higgins, 1998; Molden, Lee, & Higgins, 2008). Despite the slight difference in definition, both promotion-prevention focused goals and approach-avoidance motives have great impacts on emotional outcomes, including anger. In the following parts of this chapter, I first reviewed theories and empirical evidence on the association of approach-avoidance motives with different types of emotions, and then I specifically reviewed the theories and research regarding how approach-avoidance motives may predict anger.

Approach-avoidance motives and emotional responses

Promotion-prevention focused goals have been argued to be differentially associated with emotions with different affective value and arousal level. For instance, Higgins (1998) found that, when goals were fulfilled, promotion-focused individuals reported more intense high-arousal positive emotions (e.g. cheerfulness, happiness), but prevention-focused individuals reported more intense low-arousal positive emotions (e.g. relaxation). However, when goals failed to be fulfilled, promotion-focused individuals reported more intense low-arousal negative emotions (e.g. disappointment, discouragement), but prevention-focused individuals reported more intense high-arousal negative emotions (e.g. anxiety). Similar effects of promotion- and prevention- focused goals are also found in emotional information processing. Specifically, promotion-focused participants were found to appraise how cheerful or dejected the object made them feel more quickly; whereas prevention-focused individuals tended to appraise how quiescent or agitated the object made them feel more quickly (Shah & Higgins, 2001)

Yet, different from the above literatures on promotion-prevention focused goals, prior work on approach and avoidance motives has found that approach motives are closely tied to positive emotional consequences, but avoidance motives are closely tied to negative emotional consequences, and even physical well-being. For instance, in an experience sampling study, individuals with higher approach motivations reported more frequent positive life events, but individuals with higher avoidance motivations tended to respond toward negative life events more strongly (Gable, Reis, & Elliot, 2000). Findings from both cross-sectional and longitudinal studies

consistently showed that approach motives predicted higher subjective well-being, but avoidance motives predicted higher loneliness and physical symptoms (Elliot, Gable, & Mapes, 2006; Elliot & Sheldon, 1998; Gable, 2006).

Approach-avoidance motives and anger at general level

Specific to anger, two consistent predictions can be obtained regarding how promotion- prevention focused goals or approach-avoidance motives predict anger. First, self-regulatory theory predicted, anger, as a high-arousal negative emotion, should be produced by a failure for fulfilling prevention-focused goals (Higgins, Shah, & Friedman, 1997). That is, anger is more closely associated with prevention-focused goals relative to promotion-focused goals. Second, theories on approach-avoidance motives consistently show that avoidance motives, but not approach motives, are closely tied to negative emotional outcomes. As such, anger, as a typical negative emotional outcome, should be predicted by avoidance motives, but not by approach motives. However, findings from empirical studies on anger so far are mixed, with some aspects of anger being associated with approach motives, other aspects of anger being associated with avoidance motives.

More specifically, subjective feeling of anger is found to have a stronger correlation with approach motives than with avoidance motives. For instance, approach motives (assessed by BAS scale), relative to avoidance motives (assessed by BIS scale) were found to have a stronger association with angry feelings when recalling an anger-eliciting event (Carver, 2004). When facing failures in interactive computer games, approach motives (BAS scale) predicted the increases in

self-reported situational quarrelsomeness, resentfulness, discontent and hostility; whereas avoidance motives (BIS scale) only predicted the increase in discontent (Wingrove & Bond, 1998). More importantly, the association of approach motives with anger was even found even from early childhood. For instance, infants with higher approach motives showed a greater tendency of being angered than did those with avoidance motives when their goals were blocked (Rothtart, Derryberry, & Posner, 1994) and in turn displayed a higher level of anger or frustration even in later years (Rothtart, Derryberry, & Hershey, 2000).

Similarly, anger-related behaviors show a higher correlation with approach motives relative to avoidance motives. For instance, promotion-focused individuals were more likely to retaliate than were prevention-focused individuals (Brebels, De Cremer, & Sedikides, 2008). Similarly, higher approach motives (BAS scale) but lower avoidance motives predicted outward anger expression, including physical and verbal aggression, while higher avoidance motives but lower approach motives (BAS scale) predicted anger suppression (Cooper, Comez, & Buck, 2007).

Inconsistent with subjective feelings and anger-related behaviors, but anger-related appraisals were more closely tied to avoidance motives compared to approach motives (Keller, Hurst, & Uskul, 2008; Oyserman, Uskul, Yoder, Nesse, & Williams, 2007). For example, an experimental study (Harmon-Jones & Peterson, 2008) indicated that, individuals tended to make more negative evaluations toward the person who insulted them when prevention-focused goals were primed than when promotion-focused goals were primed. Keller et al. (2008) showed that

prevention-focused individuals showed greater sensitivity to reciprocity norm violation and tended to report more hostile and aggressive actions toward norm violator. Oyserman et al. (2007) further showed that the primed prevention-focused goals, but not promotion-focused goals, predicted increased perception of unfair treatment in workplace.

Approach-avoidance motives and anger in the social domain

Findings on anger at general level show that anger-related feelings and behaviors to greater extent are predicted by approach motives, while anger appraisals are to greater extent predicted by avoidance motives. However, findings on anger in social domain so far are inconsistent with the above findings on general anger. For instance, a study on emotional transference showed that in the processes that individuals' emotional suffering with their mother was transferred, promotion-focused individuals reported more dejected feelings, but prevention-focused individuals reported more hostile and less calm feelings (Reznik & Anderson, 2007). A recent study on forgiveness found that promotion- and prevention-focused goals predicted an equal level of forgiveness when individuals were offended by close and non-close friends (Molden & Finkel, in press).

The inconsistent findings between general anger and relationship-specific anger suggest that we should also carefully consider prior work on the impacts of approach-avoidance motives on relationship outcomes before making a prediction for how approach-avoidance motives may influence relationship effects on anger. In the next chapter, I reviewed the literatures on the impacts of approach-avoidance motives

on relationship outcomes.

CHPATER 5: APPROACH-AVOIDANCE MOTIVES AND ANGER UNDER RELATIONSHIP CONTEXTS

Applying the distinction between approach and avoidance motives to social domains, Gable (2006) proposes social motives can also be divided into approach and avoidance social motives. Approach social motives involve the desires to pursue affiliation and intimacy, and avoidance social motives involve the desires to avoid conflicts and rejection. Different from the mixed findings on the associations of approach and avoidance motives with emotional consequences, literatures on relationship consequences consistently show that approach motives predict a variety of positive relationship outcomes, but avoidance motives predict negative relationship outcomes.

Approach-avoidance motives and emotions under relationship contexts

Literatures on relationships have consistently showed that approach social motives predict positive emotional outcomes under relationship contexts, but avoidance motives predict negative emotional outcomes in relationships. For example, individuals with higher affiliation motives reported more frequent positive emotions and higher self-confidence, but individuals with higher rejection sensitivity was judged more negative and less confident (Mehrabian, 1976; Russell & Mehrabian, 1978). Across a two-month interaction with romantic partners, individuals with approach motives experienced more frequent positive social events and reported greater relationship satisfaction, but individuals with avoidance motives

reported increased negative attitudes toward the relationships and experienced more loneliness and relationship anxiety (Gable, 2006). Under the context of daily sacrifice, individuals experienced more positive emotions and reported greater relationship and life satisfaction when they sacrificed with approach motives, but experienced more frequent negative emotions and relationship conflicts, and reported lower life satisfaction and relationship well-being, when they sacrificed with avoidance motives (Impett, Gable, & Peplau, 2005). Similarly, approach sexual motives predicted greater personal and relationship satisfaction, and avoidance sexual motives were detrimental to global well-being and relationship maintenance (Impett, Parcet, & Gable, 2005).

Approach-avoidance motives and relationship outcomes

Approach and avoidance social motives are also found to be separately associated with a array of positive and negative relationship processes, including attention preferences, memory, interpretation, and specific relationship activities. More specifically, individuals with higher approach motives showed greater preference toward positive stimuli, but individuals with higher avoidance motivation showed greater preference toward threatening stimuli (Avila & Parcet, 2002; Derryberry & Reed, 1994). An experimental study further showed that individuals remembered more negative interaction with the strangers and had a higher tendency of disliking stranger when avoidance motives were primed than when approach motives were primed (Strachman & Gable, 2006). Similarly, when facing ambiguous or neutral situations, individuals with stronger avoidance motives tended to interpret

neutral information in a more negative way than did individuals with stronger approach motives (Strachman & Gable, 2006). Finally, approach and avoidance motives also have differential impacts on specific relationship activities. For instance, promotion-focused individuals tended to pay more attention to romantic alternatives and perceived them as more attractive than did prevention-focused individuals (Finkel, Molden, Johnson, & Eastwick, in press).

Approach-avoidance motives and relationship processes

In addition to the differential impacts of approach-avoidance motives on emotional and relationship outcomes, approach and avoidance motives can also produce the same emotional and relationship outcome though different underlying relationship processes. For instance, relationship satisfaction and well-being were better predicted by positive features or affects in social relationships among individuals with stronger approach motives, but were predicted by negative features or affects of social relationships among individuals with stronger avoidance motives (Gable & Poore, 2008; J. A. Updergraff, Gable, & Taylor, 2004). Similarly, both promotion- and prevention- focused can lead to forgiveness; however, forgiveness was predicted by feelings of trust among promotion-focused individuals, but was predicted by commitment of relationship among prevention-focused individuals (Molden & Finkel, in press).

Relationship outcomes as the joint products of Approach-avoidance motives and relationship contexts

Independent from such direct effects of approach-avoidance motives on relationship consequences, several recent studies revealed a relationship-specific

impact of approach and avoidance motives on emotional and behavioral outcomes (Molden, Lucas, Finkel, Kumashiro, & Rusbult, 2009; Shah, Brazy, & Higgins, 2004b). Shah, Brazy and Higgins (2004) found that promotion-focused participants displayed intergroup bias by approaching in-groups, because interaction with in-groups could increase the feelings of intimacy and trust. In contrast, prevention-focused participants displayed intergroup bias by distancing from out-groups, because interacting with out-groups might increase the feeling of insecurity and uncertainty. Moreover, both chronic and transient promotion- focused goals were found to be positively associated with high-arousal positive emotions toward in-groups, but prevention- focused goals were found to be negatively associated with low-arousal positive emotions toward out-groups. Molden et al. (2009) compared the impacts of promotion- and prevention- focused goals on personal and relationship well-being among married and unmarried partners. They found that among unmarried relationship partners who valued whether the intimacy or interdependence was increasing, perceived supports for promotion-focused goals were better predictors for personal and relationship well-being. However, among married relationship partners who valued whether the investments and security could be maintained, perceived support for prevention-focused goals were better predictors for personal and relationship well-beings.

Given the above evidence, it follows that approach-avoidance motives may also have differential influence on anger responses under different relationship contexts. From functional perspectives, anger has both bright and dark sides. On the bright

side, it may promote relationship by restoring the things to right or letting partners know their own needs (J. B. Miller & Serrey, 1997; Thomas, Smucker, & Droppleman, 1998). On the dark side, it can reduce intimacy and lead to relationship dissolution. For instance, people tended to perceive individuals who expressed anger as less warmth, nice and friendly (Clark, Pataki, & Carver, 1996). Direct anger expression delivers the signals of giving up the relationship (Holmes & Murray, 1996; Matsumoto, et al., 2009). We further expect that individuals may emphasize different functions of anger under relationship contexts with different approach and avoidance motives. In relationships that emphasize intimacy and interdependence more, individuals may tend to prioritize the bring side of anger and thus freely express anger; whereas in relationships that emphasize preventing losses more, individuals may tend to prioritize the dark side of anger and thus may be threatened by their partners' negative behaviors and in turn respond in angry manner.

CHAPTER 6: THE PRESENT STUDY

Even though prior western literatures have converged on the fact that individuals tend to experience more intense anger and express anger in more direct and less indirect manner in familiar relationships than in unfamiliar relationships. Yet regarding why such relationship effect occurred, there two relatively controversial interpretations in terms of motivation, with the first interpretation emphasizing avoidance motives, the second interpretation emphasizing approach motives, in more familiar relationships. Thus, this study has two aims. First, we aimed to systematically investigate the effect of relationship contexts on anger responses across different cultural contexts, American, Hong Kong, and Mainland China. Second, we aimed to explore how relationship effect on anger may be impacted by approach-avoidance motives.

The role of cultural context

Cultural psychologists propose that such relationship effects on anger responses may show an opposite trend in Eastern cultures due to cultural differences in motivation and hierarchy. Cross-cultural psychologists (Matsumoto, et al., 2009) argued that whereas Westerners displayed more intense anger responses in familiar relationships than in unfamiliar relationships, Easterners tended to show greater anger in unfamiliar relationships than in familiar relationships. Similarly, Yang (1993) divided Chinese relationships into kinship, friendship, and relationship with acquaintance and further argued that individuals tended to express their anger in less

direct and hostile way in kinship than in other relationships.

Such cultural effects are mainly produced by cultural difference in motivation. For motivational perspective, anger can not only strengthen the independence and autonomy of self, but also weaken the interdependence on others (Kitayama, Markus, & Kurokawa, 2000). Individualists displayed greater anger in kinship to minimize the difference between in-groups and out-groups and in turn maintain autonomy and self-dependence; collectivists did in the opposite way to maximize in-group biases and in turn strengthen the interdependence among in-group members (Matsumoto, et al., 2009).

In addition to motivation, such cultural effect can also be produced by the hierarchy within a family (Kagitcibasi, 2002; Mjelde-Mossey, Chi, & Lou, 2006).. In more individualistic cultures, kinship is characterized by emotional dependence among family members, and thus free anger expression is allowed within the family. However, in more collectivistic cultures, kinship is characterized both by emotional dependence and hierarchy, and therefore older adults with higher status are allowed to freely express their anger in family, but not in other relationships.

Taking the above literatures on cultures into consideration, we included three cultures - America, Hong Kong and Mainland China into the same study to systematically examine the effect of relationship contexts on anger responses. We expected that individuals would display greater anger responses toward familiar members in more individualist cultures; individuals would show less intense anger responses toward unfamiliar members in more collectivistic cultures.

Interpretation for relationship effect on anger

In addition, prior literatures include two alternative explanations for the above relationship effects on anger responses. The first interpretation argues that individuals displayed greater anger in more familiar relationships due to greater emphases on obligations and the loss brought by partners' hurts (Berscheid & Ammazzalorso, 2001), which is mainly produced by avoidance motives. The second interpretation argues that such relationship effects occur due to greater emphases on positive consequences relative to negative ones (Matsumoto, et al., 2009), which may be driven by approach motives to a greater extent. To test these two possibilities, we also conducted an experiment to explore the roles of approach-avoidance motives, which differentially focus on positive and negative consequences, in shaping relationship effects on anger responses in Study 2. Taking the literatures on relationship-specific role of approach-avoidance motives on emotional and relationship outcomes, we expected that when approach motives were manipulated, individuals would display more intense anger in relationships that emphasize intimacy and interdependence more; when avoidance motives were manipulated, individuals would display more intense anger in relationships that emphasize loss prevention more.

CHAPTER 7: ANGER RESPONSES UNDER RELATIONSHIP CONTEXTS: A COMPARISON OF AMERICAN, HONG KONG AND MAINLAND CHINESE

Study 1 was to investigate how individuals' anger might vary as a function of relationship context in three samples – American, Hong Kong and Mainland Chinese samples. A meta-analysis of cross-national difference in individualism-collectivism showed that European Americans were most individualistic and least collectivistic; Mainland Chinese were least individualistic and most collectivistic; whereas Hong Kong Chinese lied between them in the continuum of individualism and collectivism (Oyserman, Coon, & Kemmelmeier, 2002). Including these three cultural samples in the same study can allow us to capture the impacts of cultural context on anger and its expression, which has been proposed in cross-cultural literatures (Matsumoto, et al., 2008; Tsai, et al., 2006; Wong, Bond, & Mosquera, 2008). Regarding relationship contexts, we followed Yang's (1993) classification on Chinese relationships and conceptualized relationship context as kinship, close friendship, and casual friendship. Anger was assessed by asking participants to report their anger responses toward a series of hypothetical anger-eliciting scenarios. In short, we assessed how Americans, Hong Kong and Mainland Chinese might differentially respond to hypothetical anger-eliciting events enacted by family member, close and casual friends.

As reviewed in Chapter 3, findings from prior studies in Western samples

converged on the fact that individuals tend to display more intense anger in familiar relationships than in unfamiliar relationships; meanwhile, individuals also tend to express their anger in more direct manner in kinship than in other types of relationships (Dunn & Herrara, 1997; Vangelisti & Maguie, 2002). Consistent with these Western literatures, we expected that Americans would display more intense anger experience and expression in kinship than in the two types of friendships even after controlling for relationship qualities and personality variables. In contrast, cross-cultural studies (Matsumoto, et al., 2009; Yang, 1993) proposed that the pattern of relationship effect on anger may become opposite in Eastern cultures. That is, individuals may display more intense anger toward out-group members (e.g. acquaintances) than toward in-group members (e.g. kin). We expected that Hong Kong and Mainland Chinese would display less intense anger experience and expression in kinship than in the two types of friendships.

To ensure the expected interaction effect between culture and relationship context on anger response was not confounded by other variables, demographic, personality and relationship variables that were theoretically associated with anger responses were also controlled as covariates, including age, sex, religion, education, relationship partners' age and sex, relationship qualities, and big five personality traits (Cooper, Gomez, & Buck, 2008; Smits & De Boeck, 2007; Smits & Kuppens, 2005). In addition, to rule out the possibility that the effects of culture and relationship contexts was moderated by sex, sex was also included in the data analyses as an independent variable.

Method

Participants

The sample included 90 Americans (M = 19.22, SD = 1.34, 18-24 years, 76.7% females), 96 Hong Kong Chinese (M = 20.45, SD = 1.19, 18-23 years, 55.2% females), and 80 Mainland Chinese (M = 20.34, SD = 1.21, 18-24 years, 69.6% females). American participants were recruited from an introductory psychology class at a local university in Michigan, United States. Hong Kong Chinese participants were recruited either from general psychology classes or through a massive mailing advertisement in a local university in Hong Kong, China. Mainland Chinese participants were recruited from an introductory psychology class at a local university in Henan province, China. All participants were offered course credits or a monetary stipend for participation.

Procedures

Upon arrival, participants were randomly assigned to one of the three conditions: kinship, close friendship, casual friendship. Across all three conditions, participants were first asked to complete a relationship priming task: they were instructed to think of a specific relationship partner (family member, close friend, or casual friend) and then recall a time they spent with that relationship partner. Second, participants completed a questionnaire assessing their relationship qualities with that relationship partner. Third, participants were asked to image themselves and the relationship partner in each of 9 anger-eliciting scenarios and then rated the likelihood they would display each anger response (the Revised Anger Response Inventory; see below for description). Finally, they reported their demographic

information (see below).

Measures

Anger responses. Anger responses were measured by the Revised Anger Response Inventory (Tangney, et al., 1996). The inventory originally includes 23 anger-eliciting scenarios. To capture individuals' anger responses under different relational and cultural contexts, only 9 anger-eliciting scenarios that could occur in both kinships and friendships in Western cultures were selected and the actors in these scenarios were specified as "your family member", "your close friend", or "your casual friend". For example, one scenario says, "During an argument, your family member (your close friend or your casual friend) calls you stupid".

This inventory assesses three aspects of anger responses: subjective feelings, intentions, behavioral and cognitive responses. For each scenario (anger-eliciting situation), participants were asked to rate how angry they would be (subjective feeling). Participants were also asked about their intentions: to what extent they would like to fix the situation (constructive motive), to revenge on the target (malevolent motive) and to let off the stream (fractious motive). In addition, participants rated their behavioral and cognitive responses including direct aggression (e.g. physical and verbal aggression), indirect aggression (e.g. malediction), replaced aggression (e.g. again other people or objects) and non-aggression (e.g. taking no action) for each scenario. Ratings were made on a 5-point Likert scale and were averaged across scenarios. A higher score indicates a higher tendency to report a certain type of anger responses. The inventory was

translated into Chinese through the standard translation and back-translation process. All the scales were reliable across three samples, with alpha coefficients ranging from .57 to .88. In addition, the equivalence of each subscale across three cultures was tested with multi-group confirmative factor analysis (CFA); results revealed non-significant changes in model fits before and after constraining all the factor loadings as equal across samples for all sub-scales except for those assessing anger and constructive motives. After deleting item 7, 8, and 9, the sub-scales for anger and constructive motives are equivalent across three samples, for the detailed information see Table 1.

Table1. Sample items and the internal consistency reliabilities for anger responses

Anger response	Sample items	Alpha coefficients			
		US	HK	Mainland	$\triangle x^2$
Internal feelings					
Anger experience	How angry they would be	.705	.714	.775	33.70**
		(.687)	(.770)	(.670)	(.416)
Constructive motives	To what extent they would like to fix the situation	.689	.696	.780	31.48**
		(.724)	(.682)	(.746)	(16.84)
Malevolent motives	To what extent they would like to revenge	.845	.845	.875	5.22
Fractious motives	To what extent they would like to let off the stream	.789	.772	.743	22.38
External responses					
Direct aggression	I'd hit him as hard as I could	.781	.729	.704	11.09
Replaced aggression	I'd shove the next person that spoke to me	.682	.657	.584	16.11
Indirect aggression	I'd destroy something important to him	.692	.688	.573	9.30
Non-aggression	I'd leave the room to calm myself down	.632	.737	.721	26.47
Cognitive reappraisal	I'd wonder if I was being too sensitive	.680	.700	.688	13.09

Covariates. To ensure that the effects of age and relationship context were not confounded by relationship qualities and demographic variables, measures for these variables were also included. Relationship qualities were assessed by the Quality of Relationship Inventory (Piece, Sarason, & Sarason, 1991). It includes three subscales assessing relationship depth (e.g. how positive a role does this person play in your life), social support (e.g. to what extent could you count on this person for with a problem), and conflict (e.g. how critical of you is that person). Particip ants were asked to rate on 5-point Likert scale. All the subscales showed good reliabilities across the three cultures, with mean alpha coefficients of .85, .84 and .89. Personality characteristics were assessed by the Big five Inventory (John, Donahue, & Kentle, 1991). Participants were asked to rate extraversion, neuroticism, agreeableness, conscientiousness, and openness on 5-point Likert scale. All the subscales showed good reliabilities across the three cultures, with mean alpha coefficients of .82, .72, .84, .83 and .78. Demographic information were collected including age, sex, religion, education as well as relationship partners' age and sex.

Results

The descriptive statistics for main variables in this study are showed in Table 1. Given that subjective feeling had relatively high correlation with intentions (anger motives), and cognitive and behavioral responses were highly correlated with each other, we first grouped subjective feeling and intention as internal feelings, and cognitive and behavioral responses as external responses. Next, the associations of potential covariates with dependent variables were examined with correlation

analyses. Third, the effects of relationship contexts (kinships, close friendships, and causal friendships) and cultures (American, Hong Kong Chinese, and Mainland Chinese) were examined by two MANOVAs with relationship contexts, cultures, and sex as between-subject variables, with internal feelings (angry feelings, malevolent motives, constructive motives, and fractious motives) and external responses (direct aggression, indirect aggression, non-aggression, replaced aggression and cognitive reappraisal) as a whole separately as two sets of dependent variables. Finally, the effects of sex, cultures, and relationship contexts were repeatedly investigated with two MANCOVAs controlling for demographic, personality and relationship variables, including agreeableness, neuroticism, support, depth, age and sex of other.

Table2. Mean (SD) of anger responses and relationship qualities

	American (n = 90)			Hong Kong (n = 96)			Mainland (n = 80)		
	Kin	Close friend	Casual friend	Kin	Close friend	Casual Friend	Kin	Close friend	Casual Friend
Angry feeling	3.37_a (.49)	3.14_b (.54)	3.45_a (.50)	3.35_a (.41)	3.16_a (.66)	3.21_a (.60)	3.15_a (.79)	3.51_b (.67)	3.42_b (.56)
Malevolent motive	2.38_a (.71)	2.09_a (.67)	2.41_a (.71)	2.10_a (.71)	2.13_a (.67)	2.20_a (.70)	1.38_a (.53)	1.89_b (.83)	2.08_b (.66)
Constructive Motive	3.33_a (.68)	3.27_a (.59)	3.35_a (.74)	3.39_a (.62)	3.36_a (.63)	3.35_a (.54)	3.80_a (.82)	3.99_a (.65)	3.44_b (.53)
Fractious Motive	3.19_a (.54)	3.9_a (.95)	3.48_a (.61)	2.98_a (.60)	2.69_a (.75)	2.70_a (.66)	2.97_a (.79)	3.18_a (.68)	2.99_a (.58)
Direct aggression	1.99_a (.78)	1.72_a (.54)	1.66_a (.58)	2.05_a (.58)	1.64_b (.52)	1.60_b (.49)	1.57_a (.62)	1.52_a (.48)	1.69_a (.59)
Replaced aggression	1.64_a (.59)	1.44_a (.49)	1.64_a (.54)	1.69_a (.54)	1.54_a (.46)	1.44_a (.55)	1.74_a (.75)	1.48_a (.45)	1.49_a (.42)
Indirect aggression	1.57_a (.56)	1.68_a (.58)	1.67_a (.46)	1.83_a (.62)	1.77_a (.48)	1.92_a (.62)	1.38_a (.51)	1.55_b (.55)	1.85_b (.51)
Non -aggression	3.65_a (.41)	3.58_a (.43)	3.69_a (.39)	3.39_a (.51)	3.62_a (.52)	3.54_a (.45)	3.63_a (.55)	3.70_a (.59)	3.73_a (.49)
Cognitive reappraisal	3.14_a (.48)	3.23_a (.36)	3.22_a (.65)	2.79_a (.54)	3.16_b (.47)	3.15_b (.51)	2.99_a (.58)	3.15_a (.59)	3.08_a (.67)
Support	4.04_a (.67)	4.39_a (.52)	4.07_a (.83)	3.35_a (.87)	3.83_b (.56)	3.09c (.71)	3.82_a (.77)	3.86_a (.90)	2.96_b (.81)
Conflict	2.41_a (.58)	2.09_b (.57)	1.79_b (.57)	2.77_a (.56)	2.34_b (.69)	2.00_b (.67)	2.21_a (.46)	$2.21_{a,b}$ (.81)	1.79_b (.53)
Depth	4.06_a (.71)	$4.00_{a,b}$ (.56)	3.46_b (.90)	3.98_a (.76)	$3.64_{a,b}$ (.50)	2.59_b (.76)	4.46_a (.51)	3.39_b (.99)	2.55_c (.95)

Notes. Means with different subscripts indicates relationship difference under each cultural context at $p < .05$.

Results of MANOVA for internal feelings revealed a significant culture × relationship context interaction effect on internal feelings as a whole, F (20, 840) = 2.05, $p < .01$, $\eta^2 = .04$, but not gender ×culture × relationship context interaction effect, F (8, 318) = .67, *ns*, or gender × relationship context interaction, F (8, 318) =

1.19, *ns*. Further univariate analysis revealed a significant culture × relationship context interaction on angry feeling, F (4, 257) = 2.92, $p < .05$, $\eta^2 = .043$, on malevolent motives, F (4, 257) = 3.04, $p < .05$, $\eta^2 = .05$, and on fractious motives, F (4, 257) = 2.45, $p < .05$, $\eta^2 = .04$. Analyses of simple effect indicated that individuals displayed a significantly lower level of angry feelings, F (2, 77) = 3.35, $p < .05$, $\eta^2 = .08$, and malevolent motive, F (2, 75) = 7.40, $p < .01$, $\eta^2 = .165$, in kinship than in close and casual friendship, only in Mainland Chinese sample.

Results of MANOVA for external responses as a whole revealed a significant main effect of relationship context on external responses as a whole, for relationship context, F (10, 484) = 4.66, $p < .01$, $\eta^2 = .09$. However, all the interaction effects between gender, culture, and relationship context were non-significant, for culture × relationship context interaction effect, F (20, 803.57) = 1.02, *ns*; for culture × gender interaction effect, F (10, 484) = 1.47, *ns*; for gender × relationship context interaction effect, F (10, 484) = 1.22, *ns*; for culture × gender × relationship contexts interaction effect, F (20, 803.57) = 1.58, *ns*. Further univariate analyses revealed a significant relationship effect on indirect aggression, F (2, 246) = 3.22, $p < .05$, $\eta^2 = .03$, direct aggression, F (2, 246) = 5.46, $p < .01$, $\eta^2 = .04$, cognitive reappraisal, F (2, 246) = 4.05, $p < .05$, $\eta^2 = .03$, and replaced aggression, F (2, 246) = 3.91, $p < .05$, $\eta^2 = .03$. More specifically, individuals displayed lower indirect aggression, t (1, 176) = -.21, $p < .05$, but greater direct aggression, t (1, 176) = .24, $p < .05$, in kinship than in casual friendship, and showed a lower level of cognitive reappraisal, t (1, 179) = -.21, $p < .05$, but a higher level of direct aggression, t (1, 179) = .26, $p < .01$, and replaced

aggression, t (1, 179) = .20, $p < .05$, in kinship than in close relationship.

After controlling for agreeableness, neuroticism, support, depth, sex, age and sex of other, the effects of culture and relationship context on both internal and external anger responses remained unchanged; the interaction effect of culture and relationship contexts on internal feelings as a whole was significant, F (16, 746.07) = 2.40, $p < .01$, $\eta^2 = .09$; but the main effect of relationship context on external responses as a whole was also significant, F (10, 486) = 3.07, $p < .01$, $\eta^2 = .06$.

Discussion

Guided both by emotion theories from social and functionalist perspectives (Carolyn, 2004; Lazarus, 1991) and by theoretical arguments from cross-cultural psychology (Matsumoto, et al., 2009; Yang, 1993), we expected that individuals displayed more intense anger responses in kinship than in friendships in more individualistic cultures; whereas individuals showed less intense anger responses in kinship than in friendships in more collectivistic cultures. Differences in internal anger feelings between Hong Kong and Mainland Chinese samples partially supported our hypothesis. While Hong Kong Chinese, who are more individualistic and less collectivistic, displayed a higher level of fractious motive in kinship than in friendships, Mainland Chinese, who are more collectivistic and less individualistic, displayed a lower level of malevolent motive in kinship than in friendships. Findings on external anger behaviors, however, showed that individuals across the three cultural samples reported a higher level of external anger behaviors in kinship than in two types of friendships. Such findings remained unchanged after controlling for

agreeableness, neuroticism, support, conflicts, depth, sex, and age of other, and were also not moderated by sex.

Consistent with our prediction, relationship effect on anger were indeed found to be moderated by culture. Americans, who were most individualistic, show a higher level of anger across relationship contexts; Mainland Chinese, who were most collectivistic, showed greater anger in kinship than in friendship; Hong Kong Chinese, who lied the middle of individualism-collectivism continuum, showed greater anger in kinship than in friendship. The equally higher anger responses among Americans may be the product of ceiling effects. As descriptive information in Table 2 showed, Americans indeed tended to show a higher level of anger than did Hong Kong and Mainland Chinese. As prior literatures indicated, the difference in relationship effect on anger between Mainland and Hong Kong Chinese may be determined by both motivation and hierarchy. This possibility was tested in Study 2.

In addition, findings from this study showed that the pattern of relationship effects on internal angry feelings was different from those on external anger responses. This may point to the importance of separating different aspects of anger. Research on anger has consistently showed that angry feelings and anger-related behaviors are relatively independent and are predicted by different personality characteristics (Cooper, et al., 2008; Smits & De Boeck, 2007; Smits & Kuppens, 2005). For instance, Smits and De Boeck (2007) confirmed verbally aggressive action tendency and verbal aggression as two independent factors with factor analysis technique and found that verbal aggressive action tendency was predicted by

extraversion and trait hostility, and verbal aggression was predicted by agreeableness. Similarly, angry feelings was found to be associated with behavioral inhibition system, whereas outward display of anger was found to be associated with behavioral approach systems (Cooper, et al., 2008; Smits & Kuppens, 2005). Adding to these prior findings, we found that internal feelings were jointly predicted by relationship contexts and cultural values; external behaviors of anger were predicted by relationship contexts across cultures. This is possible that emotional expressive behaviors are shaped by relationship contexts and relevant display rules to a greater extent across cultural contexts. Further work needs to test this possibility.

Based on findings from Study 1, several conclusions can be drawn. First, relationship context, independent of relationship qualities, personality characteristics, sex of both self and relationship partner, predicts anger, particularly external anger-expressive behaviors. Second, relationship difference in anger may lie in the distinction between kinship and friendship, but not in the distinction between the two types of friendships. Third, internal anger feelings may be shaped both by relationship and cultural contexts; whereas external anger responses may be shaped by relationship contexts across cultural contexts. Meanwhile, Study 1 also has its limitations. First, it may only capture anger-related cognitive schema rather than actual anger responses with self-reported method. Second, anger responses are only assessed through a limited number of anger-eliciting situations. Third, anger-eliciting scenarios are hypothetical and thus may lack of external validity. Finally, this study is only descriptive in nature.

To address the limitations in Study 1, Study 2 improved the research design in four ways. First, we adopted recalling task to elicit emotion to increase ecological validity. Second, we assessed anger in terms of subjective feelings, physiological arousal and facial expression to well capture different components of anger, particularly actual anger behaviors. Third, we manipulated individuals' approach-avoidance motivations so that we can directly investigate why relationship effect on anger occur. Finally, we revised our conceptualization of relationship contexts in Study 2. Specifically, considering that we failed to find difference in anger between close and casual friendship, Study 2 only included two relationship conditions, kinship and friendship. In addition, given that age of relationship partner or hierarchy may also produce relationship difference in anger responses (Bond, Wan, Leung, & Giacalone, 1985), we specified kinship as sibling relationship in Study 2.

CHAPTER 8: APPROACH-AVOIDANCE MOTIVES AND ANGER RESPONSES UNDER RELATIONSHIP CONTEXTS

Study 2 mainly has two aims. First, we aimed to replicate and extend findings from study 1 by assessing anger responses under different relationship contexts in more comprehensive manner. Second, we attempted to interpret relationship effect on anger in terms of approach-avoidance motives. We selected Hong Kong Chinese female college students as participants to rule out the potential confounding effects of gender, cultures on physiological arousal (Bulter, Lee, & Gross, 2009; Mauss, Cook, Cheng, et al., 2007; Tsai, et al., 2002). In this experimental study, we adopted a between-subject design. Participants were randomly assigned to two conditions under which approach and avoidance motives would be separately manipulated and a natural condition. In each condition, half of the participants were asked to recall emotional events in a sibling relationship, and the other half were asked to recall emotional events in a friendship. We assessed participants' subjective feelings, physiological arousal, and facial expression when they were recalling emotional events.

Consistent with findings from Study 1, we expected that participants would display more intense anger in sibling relationship than in friendship. More importantly, relationship effects on anger responses would be revised by manipulating individuals' approach-avoidance motives. As mentioned in introduction section (pp. 22-23), relationship difference anger can be either because individuals

have higher approach motives so that they express anger to address their own needs and promote relationships(Matsumoto, et al., 2009) or because individuals have higher avoidance motives so that they experience and express anger when they are hurt to greater extent by partners' negative behaviors in kinship than in friendship (Berscheid & Ammazzalorso, 2001). If relationship differences in anger responses is produced by approach motives, we expect relationship difference in anger would disappear or be reversed when approach motives were manipulated. If relationship difference in anger is produced by avoidance motives, we expected that relationship difference in anger would disappear or be reversed when approach motives were manipulated.

Method

Participants

The sample consisted of 152 female college students. Participants were recruited from a local university in Hong Kong through e-mail advertisement and class announcement. All participants spoke Chinese fluently. They were offered monetary stipends or course credits for participation. All participants fit the inclusion criteria of physiological studies: no existing cardiovascular disease or medication use, no recent history of chronic physical diseases (e.g. diabetes, hypertension), and no tobacco use and excessive alcoholic beverage consumption.

Procedure

Participants were recruited via massive mailing system or from subject pool. About a week prior to the experiment, participants were screened through phone or email to ensure that they met the selection criteria described in the *Participant*

section. Meanwhile, we informed them to abstain from ingesting excitant food and drinks (e.g. coffee, tea, alcoholic beverage) and taking strenuous exercise at least 3 hours before the experiment. Upon arrival at the laboratory, participants were greeted and given a brief introduction about the experiment entitled "emotion and memory". After signing the consent form, participants were asked to report whether they followed the guidance about dieting and exercises.

Participants attended the experiment individually. A female experimenter helped participants clean the skin sites for electrodes with alcohol swab and attached 9 physiological sensors onto the participant's body in accordance to the guideline from *Cardiovascular Physiology* (Berntson, Quigley, & Lozano, 2007). Participants were then asked to sit in the most comfortable posture and to try his/her best to avoid unnecessary movement during the experiment. Their electrocardiogram (ECG) and impedance cardiogram (ICG) during experimental tasks were sampled at 500 Hz with BioNex Impedance Cardiograph and GSC Amplifier (MindWare Technologies, LTD, US). A remote camcorder hidden at the upper corner of the laboratory was adjusted to record the participants' facial expression in experimental tasks.

In the experimental section, the participant was randomly assigned to one of 6 conditions, that is, three manipulation conditions (approach manipulation, avoidance manipulation, no-manipulation) under each of two relationship contexts (sibling relationship, friendship). More specifically, we manipulated approach and avoidance motives with the manipulation procedure used in a prior study (Higgins, Roney, Crowe, & Hymes, 1994). In approach manipulation conditions, participants were

asked to describe 5 *hopes, desires and wishes* for a sibling relationship or a friendship. In avoidance manipulation conditions, participants were asked to describe five undesired outcomes or the things he/she wanted to avoid in the sibling relationship or friendship. In no-manipulation conditions, participants were asked to recall the shopping lists when they went to supermarket last time.

Across six conditions, participants completed three recalling tasks, in which they were asked to recall a neutral, angry and happy events. In the first recalling task, following the approach-avoidance manipulation, the participant was asked to recall some relatively neutral events with the instruction "Please recall a typical day in weekday and holiday in detail for about 5 minutes". Participant's ECG and ICG were continuously recorded throughout the whole recalling task. Immediately after completing the recalling task, participants were asked to rate her subjective emotional experience when recalling daily events.

In the second and third recalling tasks, participants were asked to recall a happy or angry event in a sibling relationship or a friendship. The procedure in these two recalling tasks was similar to that in neutral recalling task, except that the order of these two tasks was counterbalanced between subjects to rule out any potential order effect. For participants who recalled happy events before angry events, a funny film clip was shown to them at the end to help them to recover from negative emotions. After finishing all these three recalling tasks, physiological sensors were removed and participants were asked to complete the measures on personality and relationship qualities. Finally, participants were thanked and debriefed.

Measures

Manipulation Check Participants' approach-avoidance motives after manipulation were assessed by the revised friendship goals scales (Elliot, et al., 2006). It includes 2 subscales separately assessing approach and avoidance social goals. Approach subscale consists of 4 approach social goals like "I will enhance intimacy in my friendships", and avoidance subscale consists of 4 avoidance social goals like "I will stay away from situations that could harm my friends". The scale was originally developed to assess approach –avoidance social goals in friendship; to use it to measure approach – avoidance social motives in kinship as well, the terms "friendship" or "friends" were replaced by "siblings" or "relationships with siblings" in all relevant items. Participants were asked to respond on 5-point Likert scale ranging from "not important at all" to "very important", and a higher score of the approach and avoidance subscale indicates a higher level of approach motives and a lower level of avoidance motives respectively. The scale was translated from English into Chinese through the translation and back-translation processes. The mean alpha coefficients of approach and avoidance motives in this study were .74 and .78 respectively.

Subjective feelings Subjective feelings of anger were assessed by the affect valuation index (Tsai, et al., 2006). After each of the three recalling tasks, participants were asked to "rate how much you actually feel each of the following items on average" on 5-point Likert scale ranging from 1 (never) to 5 (extremely). The scale measures eight types of emotions in each octant of the affect circumplex: high-arousal negative affects, high-arousal affects, high-arousal positive affects,

positive affects, low-arousal positive affects, low-arousal affect, low-arousal negative affects, and negative affects. The Chinese version of the scale is available in the literature (Tsai, et al., 2006) and we used it in this study. The alpha coefficients of eight octants of emotions ranged from .52 to .86, for detailed information see Table3.

Subjective feeling	Angry recalling	Happy recalling	Neutral recalling
High-arousal Positive affects	.76	.81	.71
Positive Affects	.83	.84	.86
Low-arousal positive affects	.69	.59	.66
Low-arousal affects	.46	.68	.52
Low-arousal negative affects	.57	.62	.58
Negative affects	.69	.70	.71
High-arousal negative affects	.56	.70	.57
High-arousal affects	.52	.59	.51

Physiological Arousal Three electrocardiogram (ECG) parameters (HR, IBI, and RSA) were computed via Heart Rate Variability (HRV) analysis software (MindWare Technologies, LTD, US) from electrocardiogram after deleting the artifacts. Specifically, ECG was recorded with two disposable Ag/AgCl electrodes and a ground electrode separately positioned on the right collar bond near to the shoulder and in the middle of the left and right lower rib. Heart rate (HR) is calculated as the times of heart beat every minute. Inter-beat Interval (IBI) is calculated as the interval time between two heart beat. Respiratory sinus arrhythmia (RSA) is calculated as the high-frequency power of heart rate variability, which indicates the activation of *parasympathetic nervous system* (Rottenberg, Wilhelm,

Gross, & Gotlib, 2002).

Six ICG parameters (Z0, dzdt Max, SV, CO, PEP and LVET) were obtained with Impedance Cardiography (IMP) analysis software (MindWare Technologies, LTD, US) based on impedance cardiograph (ICG) and ECG. ICG was recorded via two pairs of disposable Ag/AgCl electrodes. A pair of electrodes for spallation neutron source (SNS) of impedance was attached on the top of the suprasternal notch and at the bottom of the breast bone over the xiphoid. Another pair of electrodes for constant current source (CCS) of impedance was posited on the back appropriately 1½ inch above the upper SNS electrode and 1½ inch below the lower SNS electrode. Basal thoracic impedance (Z0) is the mean impedance and the first derivative of the impedance signal. (dZ/dt) Max indicates the maximum value of dZ/dt. Stroke volume (SV) is the amount of blood pumped by the left ventricle each heart beat. Cardiac output (CO) is the amount of the blood pumped by the left ventricle every minute and indicates the level of *peripheral sympathetic activation* (Mauss, Cook, & Gross, 2007). Preejection Period (PEP) is the time interval from the beginning of electrical stimulation of the ventricles (Q point of ECG wave) to the opening of the aortic valve (B point on ICG wave), indicating the level of *central sympathetic activation* (Mauss, Cook, & Gross, 2007). Left Ventricular Ejection time (LVET) was the time interval from the opening to the closing of the aortic valve.

Facial expressive behaviors Participants' facial expressive behaviors were videotaped and coded in accordance to Facial Action Coding System (FACS, Ekman, Friesen, & Hager, 2002). FACS distinguishes 44 visually distinguishable facial action

units (AU; e.g. the Brow lower, the upper lid raiser). Two coders scored the intensity, duration and frequency of anger- and happiness- relevant AUs or AU combinations during three event-recalling tasks. Specifically, facial expression of anger was specified as the occurrence of AU4 and unilateral AU10, AU12, or AU14. For facial expression of happiness, we specified it as Dunchenne smile, which was also known as true smile and specified as the co-occurrence of AU6 and AU12 (Tsai, et al., 2002). To build the inter-rater reliability, half of the video clips were independently coded by two coders. The internal reliabilities for anger and true smiles were .92, and .79. Given that anger appears in a twinkling, we obtained a score for the frequency of anger by dividing frequency of anger by total time of recalling tasks. For true smiles, we obtained a score for both frequency and duration by dividing the abstract value of frequency and duration of happiness by total time of recalling tasks.

Control variables We also controlled for the potential confounding factors including relationship qualities, personality traits and demographic variables. Like in Study 1, these variables were assessed by the Quality of Relationship Inventory (Piece, et al., 1991), the Big five Inventory (John, et al., 1991) and demographic information including age, religion, education level as well as relationship partners' age and sex.

Results

Manipulation check

To investigate whether the approach and avoidance motives were successfully manipulated, we first conducted a mixed model analysis with approach-avoidance motives (approach, avoidance) as a within-subject factor, manipulation condition

(approach, avoidance and no-manipulation) as between-subject factors. Results revealed significant simple effects of manipulation condition both on approach motives, F (2, 140) = 2.99, $p < .05$, $\eta^2 = .04$, and on avoidance motives, F (2, 140) = 4.97, $p < .01$, $\eta^2 = .07$. More specifically, individuals reported significantly higher approach motives when approach motives were manipulated ($M = 4.31$, $SD = .32$) than when avoidance motives were manipulated ($M = 4.04$, $SD = .53$), $t = .27$, $p < .05$, and in no-manipulation conditions ($M = 4.09$, $SD = .71$), t =.22, *ns*. In contrast, individuals reported significantly higher avoidance motives when approach motives were manipulated ($M = 3.92$, $SD = .54$) than when avoidance motives were manipulated ($M = 3.52$, $SD = .64$), $t = .39$, $p < .01$, and in no-manipulation conditions ($M = 3.59$, $SD = .78$), $t = .33$, $p < .05$.

Table4. Mean (SD) for all indexes for anger

	Neutral	Anger	Happiness	F test
Subjective feelings				
HAP	2.87 (.068)$_a$	1.96 (.070)$_b$	3.79 (.070)$_c$	226.76**
P	3.31 (.067)$_a$	1.96 (.069)$_b$	3.97 (.060)$_c$	306.32**
LAP	3.42 (.068)$_a$	2.72 (.074)$_b$	3.19 (.063)$_c$	35.25**
LA	2.55 (.070)$_a$	2.25 (.061)$_b$	1.87 (.061)$_c$	53.66**
LAN	2.61 (.073)$_a$	2.13 (.066)$_b$	1.75 (.057)$_c$	77.05**
N	2.07(.065)$_a$	2.78 (.073)$_b$	1.47 (.047)$_c$	130.67**
HAN	2.05 (.066)$_a$	2.46 (.069)$_b$	1.46 (.045)$_c$	95.97**
HA	2.28 (.050)$_a$	2.06 (.055)$_b$	2.09 (.057)$_b$	6.07**
Physiological arousal				
HR	80.29 (9.42)$_a$	79.27 (9.10)$_b$	78.09 (8.72)$_c$	24.21**
IBI	754.58(88.38)$_a$	768.55(85.15)$_b$	778.26 (87.65)$_c$	27.23**
LVET	276.91(33.07)	279.77(31.68)	280. 07(31.86)	1.36
SV	211.80 (132.06)$_a$	175.06(105.47)$_b$	181.18 (122.98)$_c$	22.87**
CO	17.53 (11.52)$_a$	15.27 (11.30)$_b$	14.18 (9.76)c	20.68**
PEP	129.85 (13.10)$_a$	129.64 (13.44)$_a$	132.45 (14.32)$_b$	5.42**
Z0	11.11 (4.12)$_a$	12.05 (4.86)$_b$	12.18 (4.97)$_b$	7.59**
dZ/dt	1.46 (.52)$_a$	1.42 (.52)$_a$	1.45 (.51)$_a$	1.49
RSA	5.68 (.80)$_a$	5.75 (.80)$_b$	5.78 (.81)$_b$	4.83**
Facial expression				
Smile duration	.11 (.14)$_a$	.21 (.33)$_b$	.26 (.22)$_c$	16.09**
Smile frequency	0.02 (.01)$_a$	.02 (.02)$_a$	.03 (.01)b	7.76**
Anger frequency	--	--	--	--

Notes. HAP= high-arousal positive affects; P = positive affects; LAP = low-arousal positive affects; LA= low arousal affect; LAN = low-arousal negative affects; N= negative affects; HAN = high-arousal negative affects; HA = high-arousal affects; HR = heart rate; IBI = inter-beat interval; LVET = left ventricular ejection time; SV = stroke volume, CO = cardiac output; PEP = preejection period; Z0 = basal thoracic impedance; dZ/dt = Max of dz/dt; RSA= respiratory sinus arrhythmia.

** $p < .01$

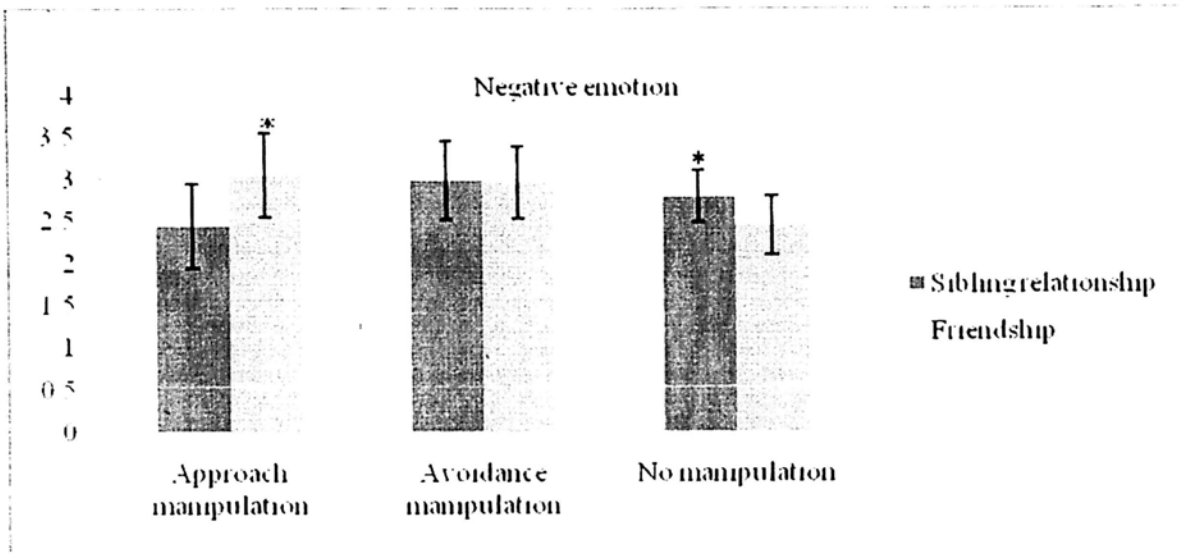
To determine whether we have successfully elicited the target emotions, we also conducted a set of repeat-measured with recalling tasks as an independent variable, emotional responses as dependent variables. Results revealed that emotional responses in anger recalling conditions were significantly different from those in happiness recalling conditions except for LVET and dz/dt (see Table 4), suggesting

that three recalling tasks, as a emotion-eliciting technique in this study, have successfully elicited significantly different emotions.

Subjective feelings as functions of manipulation condition and relationship context

To examine the effects of approach-avoidance manipulation and relationship contexts on subjective feelings during recalling tasks, a set of manipulation condition (approach, avoidance, no-manipulation) × relationship context (sibling relationship, friendship) × recalling task (anger, happiness) MANCOVAs were conducted on each type of eight emotions controlling for the corresponding emotion during neutral recalling tasks, agreeableness, neuroticism, conflicts, supports, and depth.

Results of MANCOVA revealed a significant manipulation condition × relationship context × recalling task interaction effect only on negative emotion, $F(4, 278) = 3.37, p < .05, \eta^2 = .05$. Follow-up analyses revealed a significant simple interaction effect of relationship context and recalling task only in no-manipulation condition, $F(1, 141) = 3.72, p < .05, \eta^2 = .12$. That is, in the no-manipulation condition, individuals reported higher negative emotions in sibling relationship ($M = 2.79, SD = .63$) than in friendship ($M = 2.45, SD = .71$) when recalling anger-eliciting events, $F(1, 46) = 3.07, p < .05, \eta^2 = .06$; but such relationship differences in negative emotions were not found when recalling a happy event, $F(1, 46) = 2.20$, *ns*. Furthermore, we also found that, when approach motives were primed, individuals reported less intense negative emotions in sibling relationship ($M = 2.44, SD = .99$) than in friendship ($M = 3.05, SD = 1.01$) during both angry and happy recalling tasks, $F(1, 46) = 6.69, p < .05, \eta^2 = .10$, see Figure 1.



Physiological arousal as functions of manipulation condition and relationship contexts

Given that the raw scores of physiological responses were transformed by minute, we first computed a mean score for each physiological index within each recalling task. Second, we deleted the data beyond 3 standard deviations to ensure the findings were not biased by outliers. Third, we computed a change score of each physiological index from baseline by subtracting the mean score of each physiological index during the neutral event recalling task from that during the happy or angry recalling tasks. Finally, to reveal the effects of manipulation condition and relationship context on each physiological index, a set of repeated-measured MANCOVAs were conducted with manipulation condition and relationship context as between-subject factors, recalling task as a within-subject factor, and each index of physiological responses as a dependent variable controlling for conflicts, depth, agreeableness and neuroticism.

Analyses of electrocardiogram (ECG) revealed a significant manipulation condition × relationship context × recalling task interaction effect on *heart rate*, F (2,

139) = 4.67, $p < .01$, $\eta^2 = .06$, and on *respiratory sinus arrhythmia*, F (2, 141) = 3.24, $p < .05$, $\eta^2 = .04$, but not on *inter-beat interval*, F (2, 139) = 2.96, *ns*. Follow-up analyses showed that, in the approach manipulation conditions, the simple interaction effect between relationship context and recalling task was significant on *heart rate*, F (1, 141) = 7.92, $p < .01$, $\eta^2 = .132$. That is, when approach motives were manipulated, individuals showed a greater decrease in *heart rate* from baseline in sibling relationship (M = -3.28, SD = 0.8) than in friendship (M = -1.18, SD = 1.13) during angry recalling tasks, F (1, 137) = 3.15, $p < .05$, $\eta^2 = .05$, see Figure 2.

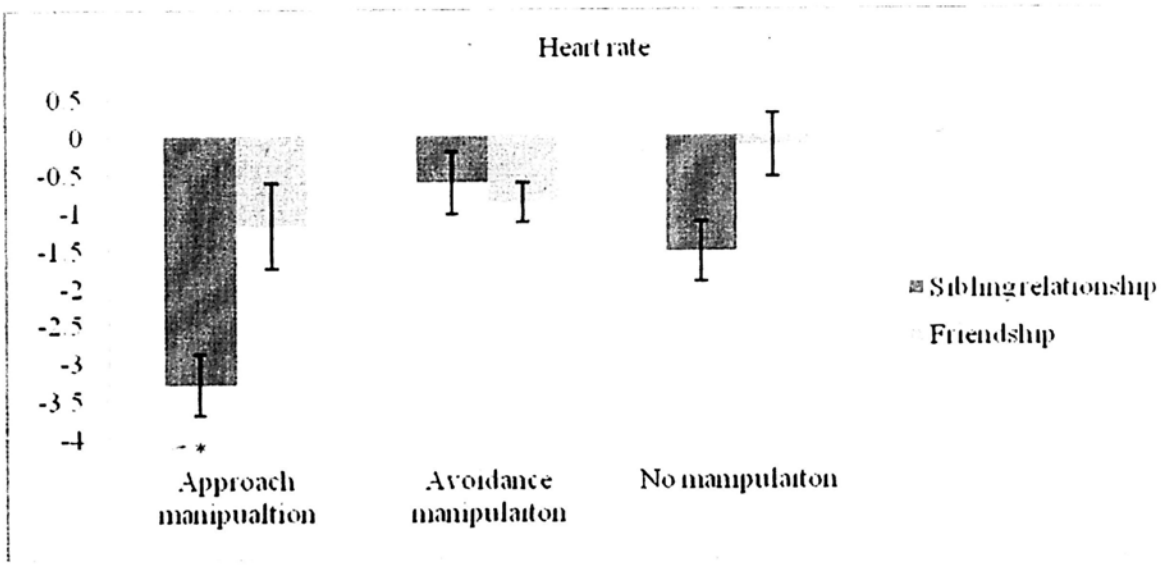
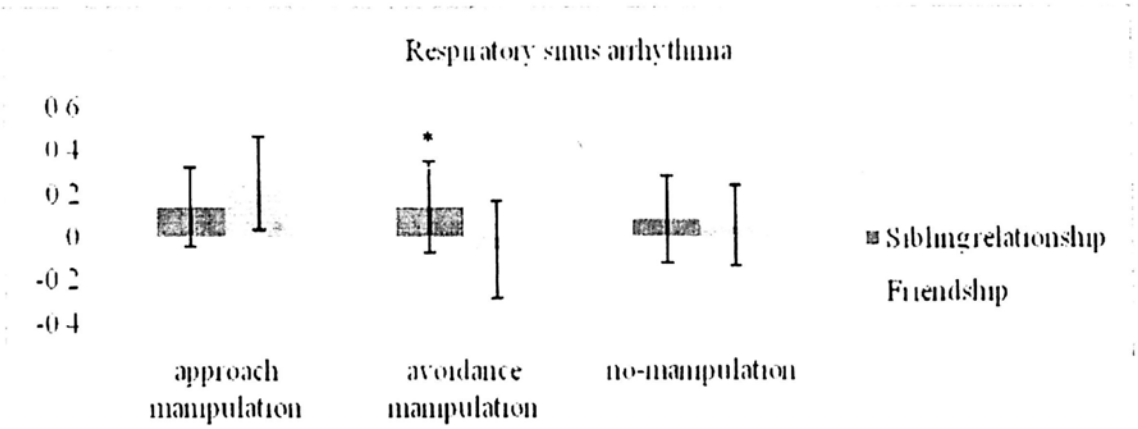


Figure2. Heart rate as functions of manipulation condition and relationship contexts

In the avoidance manipulation conditions, a simple interaction effect between relationship context and recalling task was found on *respiratory sinus arrhythmia*, F (1, 142) = 5.21, $p < .05$, $\eta^2 = .04$. That is, when avoidance motives were primed, individuals displayed a greater increase in *respiratory sinus arrhythmia* from baseline in sibling relationship than in friendship during happy recalling tasks, F (1, 142) = 3.16, $p < .05$, $\eta^2 = .05$.



Analyses of impedance cardiograph (ICG) revealed a significant manipulation condition × relationship context × recalling task interaction effect on *cardiac output*, F (2, 132) = 4.42, $p < .05$, $\eta^2 = .063$, and on *pre ejection period*, F (2, 136) = 4.72, $p < .01$, $\eta^2 = .065$; not on other ICG parameters, including *left ventricular ejection time*, F (2, 136) = .06, *ns,* on *stroke volume*, F (2, 136) = 2.08, *ns*, b*asal thoracic impedance*, F (2, 136) = 3.04, *ns*, *dZ/dt*, F (2, 136) = 2.65, *ns*. Follow-up analyses on *cardiac output* revealed a significant recalling task × relationship context simple interaction effect in avoidance manipulation condition, F (1, 134) = 3.99, $p < .05$, $\eta^2 = 06$, and a marginally significant recalling tasks × relationship context interaction effect in the approach manipulation condition, F (1, 134) = 3.14, $p = .08$, $\eta^2 = .05$. That is, when avoidance motives were manipulated, individuals displayed less decreases in *cardiac output* from baseline in sibling relationship (M = 0.56, SD = 1.21) than in friendship (M = -4.52, SD = 1.82) during an anger recalling task, F (1, 134) = 3.39, $p < .05$, $\eta^2 = .07$. When approach motives were manipulated, individuals displayed greater decreases in *cardiac output* from baseline in sibling relationship (M

= -5.74, *SD* = 2.41) than in friendship (*M* = -.11, *SD* = 2.03) when recalling an anger-eliciting event, $F(1, 134) = 3.31$, $p < .05$, $\eta^2 = .07$, see Figure 3.

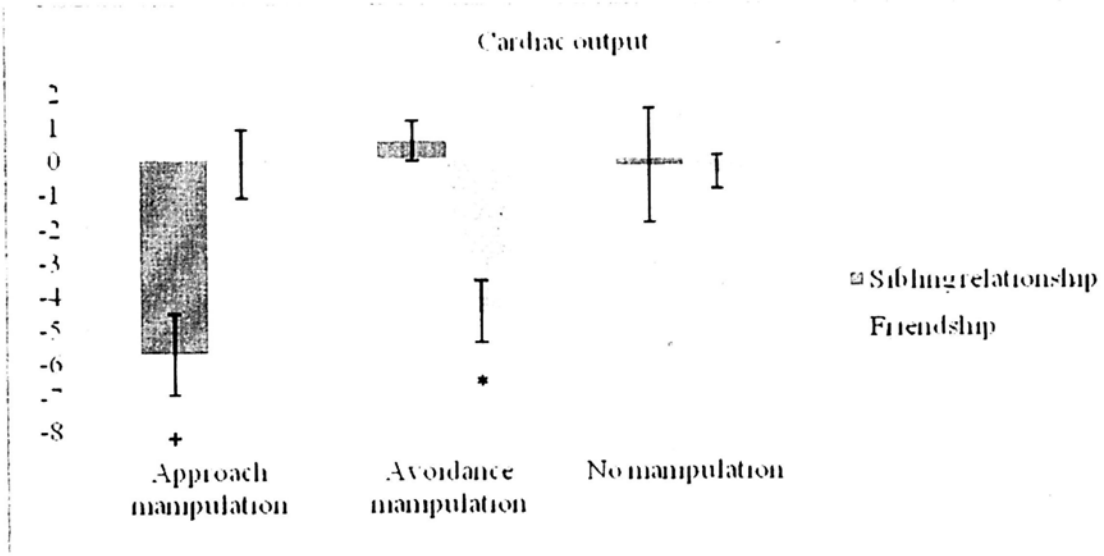


Figure 3. Cardiac output as a function of manipulation and relationship contexts

Further analyses of *pre ejection period* revealed a significant recalling tasks × relationship contexts interaction effect only in the approach manipulation condition, $F(1, 138) = 11.42$, $p < .05$, $\eta^2 = .07$. When approach motives were manipulated, individuals displayed an increase in *pre ejection period* from baseline in kinship (*M* = 2.19, *SD* = 2.19) but a decrease in *pre ejection period* from baseline in friendship (*M* = -2.95, *SD* = 1.95) during an anger recalling task, $F(1, 138) = 7.63$, $p < .01$, $\eta^2 =$ 06, See Figure 4.

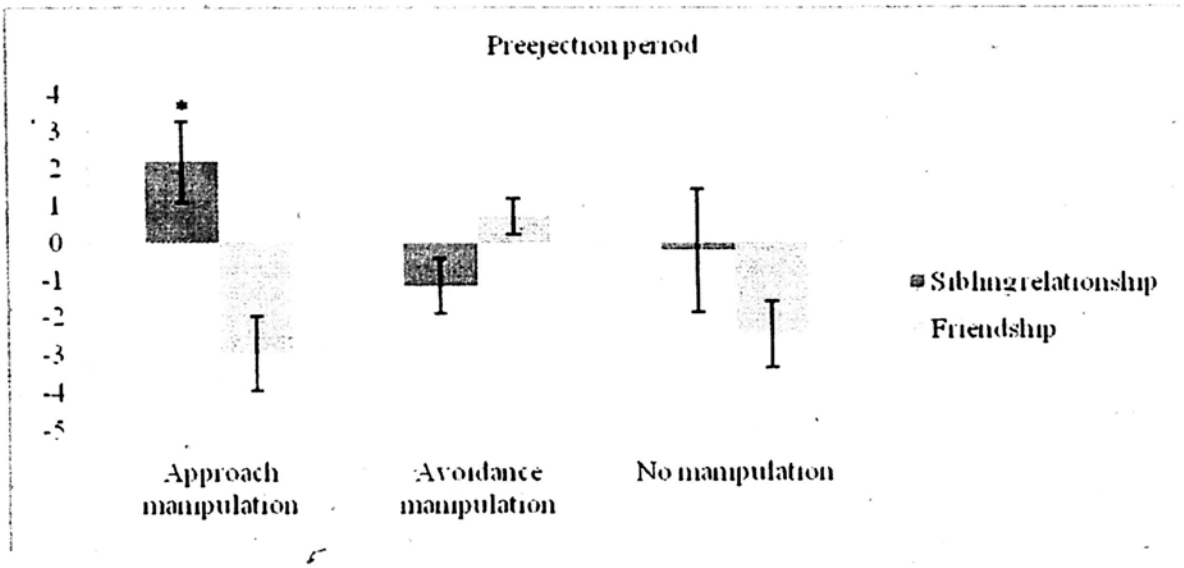


Figure5. Pre-ejection period as functions of manipulation condition and relationship context.

Facial expression as functions of manipulation condition and relationship context

To examine the effects of approach-avoidance manipulation and relationship context on facial expression during recalling tasks, a set of manipulation condition (approach, avoidance, no-manipulation) × relationship context (sibling relationship, friendship) × recalling task (anger, happiness) ANCOVAs were conducted on each index of facial expression controlling for the corresponding index of facial expression during neutral recalling task, agreeableness, neuroticism, conflicts and depth.

Analyses revealed a significant manipulation condition × relationship context × recalling task interaction effect on the frequency of true smile, $F(2, 94) = 3.09$, $p < .05$, $\eta^2 = .062$, but not on the duration of true smile, $F(2, 94) = .16$, *ns*. Follow-up analyses revealed a significant recalling task × relationship context simple interaction effect on the frequency of true smile in the no-manipulation condition, $F(1, 31) = 4.16$, $p < .05$, $\eta^2 = .12$, but not in the approach manipulation condition, $F(1, 31) = 2.21$, *ns*, or avoidance manipulation condition, $F(1, 31) = 3.17$, *ns*. Specifically,

individuals displayed less frequent true smile in sibling relationship than in friendship during anger recalling task in the no-manipulation condition, F (2, 94) = 5.82, $p < .05$, $\eta^2 = .154$, but such relationship effects were not found in happiness recalling tasks in the same condition, F (1, 32) = .34, *ns.* However, individuals displayed no angry facial expression across different conditions, see Table 4.

Discussion

Consistent with Study 1, we predicted that individuals would display more intense anger in sibling relationship than in friendship, and such relationship effect on anger can be changed when approach or avoidance motives were manipulated. Findings on subjective feeling and facial expression during anger recalling tasks supported our predictions. Individuals indeed reported more intense negative emotion and less frequent true smile in sibling relationship than in friendship when recalling anger-eliciting events under no-manipulation condition. Such relationship effect on anger was eliminated by manipulating approach motives and was reversed by manipulating avoidance motives. For physiological arousal, we found that, when approach motives were manipulated, participants' sympathetic nervous arousal that was sensitive to negative emotions, as indexed by cardiac output, pre-ejection period, greatly reduced in sibling relationship, but not in friendship, during anger recalling tasks; when avoidance motives were manipulated, participants' parasympathetic nervous arousal that was more sensitive to positive emotions, as indexed by respiratory sinus arrhythmia, were suppressed in friendship, but not in sibling relationship, during happy recalling tasks.

Findings from prior physiological studies on anger (Mauss, Cook, & Gross, 2007; Nealey-Moore, Smith, Uchino, Hawkins, & Chrisana, 2007; Ray, et al., 2008), as reviewed in Chapter 1, have revealed that anger elicited by various methods consistently produced an increase in sympathetic nervous arousal, including increased heart rate, blood pressure, skin conductance, cardiac output and decreased pre ejection period. Study 2 also observed the effects of relationship context and manipulation condition on anger-related changes in sympathetic nervous arousal, as indicated by cardiac output, heart rate, and pre ejection period. In contrast, we found a relationship effect on respiratory sinus arrhythmia (RSA) during happy recalling tasks. This may be because physiological parameters had only sensitive to certain types of stimuli. Physiological indexes of sympathetic nervous system might be more sensitive to the changes of anger and other negative emotions (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000). Parasympathetic system were more sensitive to the changes of pleasant stimuli (Kling, 1933; Oveis, et al., 2009).

As mentioned in last paragraph, while prior studies on anger have revealed an increase in sympathetic arousal, we revealed a non-significant change in sympathetic nervous arousal from baseline during anger recalling task. There are two possibilities. First, physiological arousal during anger recalling tasks in Study 2 may be lower compared to those frequently reported in prior studies. For instance, a cross-cultural physiological study indeed found that Easterners tended to showed less increase in blood pressure than did Westerners when they are instructed to suppress anger (Bulter, et al., 2009). Similar to blood pressure, Hong Kong Chinese participants in

Study 2 may have lower sympathetic arousal than Western participants even facing the same stimuli, and thus we failed to reveal an anger-related increase in sympathetic arousal from baseline. Second, it might also be because participants displayed greater sympathetic nervous arousal in Study 2 in baseline condition, compared to those from prior literatures. In prior studies on anger, baseline was built as a resting period or neutral film viewing tasks (Mauss, Cook, & Gross, 2007; Tsai, et al., 2002). Different from prior studies, we used physiological arousal in neutral recalling tasks as the baseline to rule out the potential confounding factors like speaking, or the speed and loudness of speech (Nealey-Moore, Smith, Uchino, Hawkins, & Olson-Cerny, 2007). The changes of baseline may heighten participants' physiological arousal under baseline condition and in turn reduced physiological increases from baseline.

Findings on physiological arousal revealed that approach motives can reduce individuals' sympathetic nervous reactivity, including decreased cardiac output and heart rate as well increased pre ejection, when recalling angry events in kinship. This finding is consistent with the limited number of existing physiological studies on regulatory focus (Seery, Weisbuch, & Blascovich, 2009). Seery et al. (2009) examined the impacts of outcome framework on physiological arousals in a stressful cognitive task and found that individuals displayed a more adaptive pattern of physiological arousal in gain-framework condition than they did in loss-framework condition. As such, approach social goals, like other positive characteristics (e.g. support) in relationship (Uchino, T., & Kiecolt-Glaser, 1996), may have potential

"stress-buffering" or "calming" effect on physiological arousal.

It should be noted that the "calming" effect of approach motives on anger-related physiological arousal is only specific to kinship. This is consistent with findings from prior physiological studies on social relationships. For instance, a experience sampling study showed that daily interaction with family members and spouses predicted the decreases in blood pressure even after controlling for the qualities and affective tones of relationship (Holt-Lunstad, Uchino, Smith, Olson-Cerny, & Nealey-Moore, 2003). Numerous studies on social support also indicated that the presence of family member and staying with family members reduced physiological arousal during stressful situation (Edens, et al., 1992; Snydersmith & Cacioppo, 1992; Spitzer, et al., 1992). Holt-Lunstad et al. (2003) interpreted that the calming effects of kinship on sympathetic nervous arousal were a product of the long history or familiarity between kin. This may suggest the unique roles of positive characteristics of kinship in regulating negative feelings and health outcomes.

In short, Study 2 found that individuals displayed greater subjective feeling and facial expression of anger in kinship than in friendship. Such relationship effects on anger responses were eliminated when avoidance motives were manipulated and were reversed when approach motives were manipulated. Meanwhile, we found that individuals displayed lower level of sympathetic reactivity to anger-eliciting events in kinship than in friendship when approach motives were manipulated, whereas they displayed lower level of parasympathetic arousal to happy events when avoidance

motives were manipulated.

CHAPTER 9: GENERAL DISCUSSION AND CONCLUSION

Building on emotion theories from social and functionalist perspectives (Carolyn, 2004; Lazarus, 1991), two studies were conducted to investigate how and why individuals' anger responses might vary with relationship contexts. Study 1 investigated how individuals might differentially respond to anger-eliciting event caused by a kin, a close or a casual friendship in three samples: American, Hong Kong and Mainland Chinese sample.

Meanwhile, two seemingly controversial explanations were found regarding why anger differed depending on relationship contexts. Some researchers argued that individuals in Western cultures tended to be angered by familiar others because individuals had higher avoidance motives when interacting with familiar others than with unfamiliar others. Others argued that such relationship effect occurred in that individuals had higher approach motives in familiar relationships than in other relationships. To resolve this controversy, Study 2 manipulated participants' approach and avoidance motives and then examined how relationship effect on anger would be differed when approach or avoidance motives were manipulated.

Effects of relationship context on anger responses

Findings from Studies 1 and 2 consistently showed that individuals displayed more intense responses toward anger-eliciting events elicited by a kin than by a friend even controlling for personality characteristics, relationship qualities, sex of self and partner, age of partner. Study 1 found that individuals reported a higher level of direct and replaced aggression but a lower level of cognitive reappraisal and

indirect aggression in kinship than they did in two types of friendships across American, Hong Kong and Mainland Chinese samples; Hong Kong Chinese even displayed a higher level of fractious motives in kinship than in friendship. Study 2 showed that individuals reported more intense subjective feeling and less frequent facial expression of anger in sibling relationship than in friendship in natural condition.

Our findings were consistent with those from a multicultural study on display rules, which revealed the cross-cultural universality of expressing anger more in in-groups than in out-groups (Matsumoto, et al., 2008). As Matsumoto et al. (2009) argued, this might reflect the universal nature of different relationship contexts across cultures. That is, kinship may be characterized by involuntary nature, familiarity, trust, longer history of shared experience across cultures (Galvin & Cooper, 1990) and individuals universally had a greater level of feeling of security and certainty when expressing anger in kinship. In contrast, friendships were voluntary, egalitarian and fragile in nature (Laursen, 1993), and individuals showed a tendency of avoiding negative consequences of anger expression in friendship to ensure their own security.

Relevant to this point, this may also reflect kin selection in evolutionary processes, which refers to the phenomenon that individuals tended to show favorable attitudes toward kin so as to increase the chance to pass down their gene (Hamiltin, 1964). Kin selection has been found in a variety of social phenomena, including social support (Neyer & Lang, 2003; Reinhardt, Boerner, & Benn, 2003), benevolent attribution (Ackerman, Kenrick, & Schaller, 2007), social exchange (Clark, 1984;

Fung, Yeung, Li, & Lang, 2009; Ikkink & van Tilburg, 1998; Lang & Neyer, 2005), punishment decision (Lieberman & Linke, 2007). Extending prior literatures, we found that individuals displayed external anger behaviors in more direct way in kinship than in other relationships, even in closer friendships. This suggests that kinship, relative to all other relationships, is such a favorable social context that family members can express negative emotions freely and directly when their needs were not met.

Moreover, findings from both studies in this thesis revealed an unequal predictive power of relationship context for different components of anger. Study 1 found that Hong Kong Chinese reported a higher level of anger-related behaviors and action tendencies, but such relationship effect was not found on subjective anger experience. Study 2 revealed individuals displayed less frequent facial expression of happiness and more intense subjective feelings of anger in kinship than in friendship; but such relationship effect was not found on physiological arousal of anger. According to process model of emotion regulation (Gross, 1998), more external emotion expressive behaviors, but not internal emotional arousals, were shaped by response modulation such as display rules. The dissociation of external emotion expressive behaviors and internal emotion experience is indeed frequently found in literatures on emotion. For instance, a study on emotion expression found that emotion experience was partially related to emotion expressive behaviors only among individuals with higher expressivity; external and external aspects of emotions were totally unrelated among individuals with lower expressivity (Gross,

John, & Richards, 2000). A study on cultural difference in emotion revealed that different aspects of emotions were equally predicted by cultural factors. Hmong American showed lower facial expression in emotion recalling tasks than did European Americans, but such cultural effect was not found on actual emotion experience and physiological arousal (Tsai, et al., 2002). Similar to cultural literatures, we found that different aspects of anger were also differentially predicted by relationship factors: relative to physiological reactivity and internal feelings, facial expression and anger-expressive behaviors were more sensitive to relationship contexts.

Explaining anger under relationship contexts by approach-avoidance motives

As frequently mentioned earlier, two inconsistent explanations have been proposed regarding why individuals displayed higher anger in kinship than in friendship. Some researchers argued that it is because individuals were motivated to avoid conflicts and hurts more in kinship than in friendships and thus similar negative events can elicit greater anger when they are elicited by family members than by friends; other researchers argued that individuals expressed more anger in kinship than in friendship, because they focused on negative consequences less and positive consequences more when expressing anger. Findings from Study 2 showed that relationship effects on subjective feelings and facial expression of anger were revised by both approach and avoidance motives. Specifically, relationship differences in subjective feeling and facial expression in natural conditions were eliminated when avoidance motives were manipulated, but were eliminated and even

reversed when approach motives were manipulated. This may suggest that anger responses under relationship contexts, at least subjective feeling and facial expression, can be impacted by both approach and avoidance motives and may be impacted by approach motives to greater and wider extent relative to avoidance motives.

Our findings on cardiovascular functions were consistent with prior literatures on the impact of approach-avoidance motives on psychological consequences. As reviewed in *Introduction* section, more recent Western literatures showed that the impacts of approach-avoidance motives on psychological well-being were relationship-specific. In approach-oriented relationships, individuals reported higher relationship and personal well-being when their approach goals were fulfilled (Molden, et al., 2009), and displayed more positive and less negative emotions while approaching such relationship partners(Shah, Brazy, & Higgins, 2004a). On contrast, in avoidance-oriented relationships, individuals reported higher relationship and personal well-being when either approach or avoidance motives were fulfilled (Molden, et al., 2009), and reported more anxious and less relaxed emotions while avoiding such relationship partners(Shah, et al., 2004a). Adding to these prior literatures, we provide the first evidence for a relationship-specific role of approach-avoidance motives in impacting cardiovascular reactivity to angry and happy events. When approach motives were manipulated, individuals displayed lower sympathetic activation to angry events in kinship than in friendship; whereas when avoidance motives were manipulated, individuals displayed lower

parasympathetic activation to happy events in friendship than in kinship.

We also found that when approach motives were manipulated, individuals showed a greater decrease in cardiac output during anger recalling tasks in kinship than in friendship; whereas when avoidance motives were manipulated, individuals showed a greater decrease in cardiac output in friendship than in kinship. Despite cardiac output, similar pattern, although non-significant, was also found in heart rate and pre-ejection period. Take all the findings together, it may suggest the possibility that when approach motives lead to a greater decrease in sympathetic reactivity to anger-eliciting events in kinship than in friendship, avoidance motives may produce the greater decrease in sympathetic reactivity to anger-eliciting events in friendship than in kinship. That is, increased approach motives led to decreased anger-related sympathetic reactivity in kinships, increased avoidance motives led to decreased anger-related sympathetic reactivity in friendship.

The above findings on physiological arousal are consistent with our findings on subjective feelings and facial expression: relationship difference in anger responses are jointly determined by approach and avoidance motives. Yet, such findings further indicate that the impacts of approach-avoidance motives on physiological anger responses are relationship-specific: anger responses in kinship may be determined by approach motives, but anger responses in friendship may be determined by avoidance motives. That may serve as an interpretation for culture by relationship context interaction effect on internal angry feelings in Study 1. That is, among Mainland Chinese who had higher level of avoidance motives, individuals tended to

show more intense anger responses in friendship than in kinship; however, among Hong Kong Chinese who had higher level of approach motives, individuals tended to showed more intense anger responses in kinship than in friendship.

Inconsistent with prior literatures (Elliot, 2008), the above findings showed that both approach and avoidance motives were negatively associated with anger responses. This may reflect cultural variance in the impact of approach-avoidance motives on individuals' reactivity to positive and negative stimuli. For instance, a cultural study showed that avoidance goals predict greater loneliness and worse health outcomes among Westerners, but predict lower level of loneliness and better health (Takagi, 2005). Whereas prior literatures revealed a positive relationship between approach motives and anger, Studies on ideal affect found that Westerners tended to value high-arousal positive affects, but Easterner tended to value low-arousal positive affects (Tsai, et al., 2006). Perhaps due to the pursuit of low-arousal positive affects, individuals tended to show lower anger responses no matter which motives were strengthened. Future study should further test this possibility.

Implications, limitations and future directions

The present study theoretically extended prior literatures in three ways. First, finding from both studies in general indicated that individuals displayed more intense anger, particularly anger-related behaviors, in kinship than in friendship. These findings provided cross-cultural supporting evidence for emotion theories from social and functionalist perspectives, which emphasize the roles of relationship contexts in

determining emotional responses (Carolyn, 2004; Lazarus, 1991). Second, findings from Study 1 revealed that Hong Kong Chinese displayed greater fractious motives in kinship than in friendship, and Mainland Chinese displayed less malevolent motives in kinship than in friendship, but such cultural effect was not found on external expressive behaviors of anger. Study 1 not only supported theoretical argument from cross-cultural psychology (Matsumoto, et al., 2009; Yang, 1993), but also provided the first empirical test of Yang's (1993) theory on Chinese relationships. Finally, Study 2 provided experimental evidence for how approach and avoidance motives may impact anger under relationship contexts, which not only is an unanswered questions in the field of social relationships (Gable, 2006), but also involves the controversial issue regarding why relationship difference in anger occur, see Chapter 3.

Despite theoretical implications, findings from this study also have practical implications for health promotion and emotion regulation. In Study 2, we found unique beneficial effects of approach motives in kinship on emotional, physiological and behavioral aspects of anger. This may suggest that if individuals want to minimize the negative consequences of anger under relationship contexts, different regulatory strategies and motivations may be needed in different relationships. Specifically, approach motives may help people effectively cope with anger within families and in turn buffer against the destructive consequences of negative interaction on health, but avoidance motives may do so in friendship.

However, further work is needed to extend the current study. First, this study

assessed anger with hypothetical scenarios (Study 1) and recalling tasks (Study 2). Although both methodologies are commonly used anger-eliciting methods with good construct and ecological validity (Lobbestael, et al., 2008; Tangney, et al., 1996), elicited anger may only to some extent resembles anger in real life. In further studies, we can adopt experience sampling method to replicate our findings in daily life setting.

Second, the inconsistent findings were found in these two studies. For instance, Study 1 revealed a significant main effect of relationship context on anger-related behaviors, but not on angry feelings; study 2 found that relationship effect was significant on subjective feeling and facial expression, but not on physiological arousal (action tendencies). This may be produced by different conceptualization of kinship in two studies. Study 2 conceptualized kinship as sibling relationship; however, sibling relationship was a type of kinship with the highest similarity to friendship (K. A. Updergraff & Obeidallah, 2001). In this sense, relationship effect between kinship and friendship may be greatly reduced by high similarities between sibling relationship and friendship. Future study should test this possibility and further explore how anger is differed in greater types of relationships.

To reduce the number of potential confounding factors, only female Hong Kong Chinese college students were recruited in Study 2. Yet, finding from prior studies showed that approach-avoidance motives (promotion-prevention focused goals) had totally opposite effect in different age groups (Ebner, Freund, & Baltes, 2006) and cultural groups (Hamamura & Heine, 2008) For instance, Ebner et al. (2006) found

that prevention orientation had positive association with general well-being among older adults, but had negative association with well-being among younger adults; whereas promotion orientation had negative association with general well-being among older adults, but had positive association with well-being among older adults. Future studies should test whether and when findings from the current study can be replicated in other populations.

Concluding remarks

Findings from the two studies in this thesis revealed that individuals displayed a higher level of anger expression in kinship than in friendship across American, Hong Kong and Mainland Chinese samples, even after controlling for relationship qualities and anger-related personality traits and demographic variables. Such relationship effect on anger response might at least in part be accounted for by both approach and avoidance motives, particularly approach motives. More interestingly, approach motives were found to have a calming effect on sympathetic arousal during anger calling task in kinship, but not in friendship. Findings from this study may have great implications for emotion regulation and health promotion under relationship contexts.

References

Ackerman, J. M., Kenrick, D. T., & Schaller, M. (2007). Is friendship akin to kinship? *Evoluntion and Human Behavior, 28*, 365-374.

Averill, J. (1983). Studies on anger and aggression: Implications for theories of emotion. *American Psychologist, 38*, 1145-1158.

Avila, C., & Parcet, M. A. (2002). Individual differences in reward sensivity and attention focus. *Personality and Individual Differences, 33*, 979-996.

Berntson, G. G., Quigley, K. S., & Lozano, D. (2007). Cardiovascular psychophysiology. In J. T. Cacioppo, L. G. Tassinary & G. G. Berntson (Eds.), *Handbook of Psychophysiology*. New York: Cambridge University Press.

Berscheid, E., & Ammazzalorso, H. (2001). Emotional experience in close relationships. In G. J. O. Fletcher & M. S. Clark (Eds.), *Blackwell handbook of social psychology: Interpersonal processes (pp. 308-330)*. UK, Oxford: Blackwell Publishers.

Bishop, G. D., Ngau, F., & Pek, J. (2008). Domain-specific assessment of anger expression and ambulatory blood pressure. *Personality and Individual differences, 44*, 1726-1737.

Blascovich, J. (2008). Challenge and threat. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation*. Mahwah, NJ: Lawrence Erlbaum Associates.

Blascovich, J., Mendes, W. B., Hunter, S. B., Lickel, B., & Kowai-Bell, N. (2001).

Perceived threat in social interaction with stigmatized others. *Journal of Personality and Social Psychology, 80*, 253-267.

Bond, M. H., Wan, K. C., Leung, K., & Giacalone, R. A. (1985). How are responses to verbal insult related to cultural collectivism and power distance. *Journal of Cross-Cultural Psychology, 16*, 111-127.

Bongard, S., & al' Absi, M. (2003). Domain-specific anger expression assessment and blood pressure during rest and acute stress. *Personality and Indivudal differences, 34*, 1383-1402.

Boxter, Wilmot, Simmons, & Swartz (1993). Ways of doing conflict: A folk taxonomy of conflict events in personal relationships. In P. J. Kalbfleisch (Ed.), *Interpersonal communication*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Brebels, L., De Cremer, D., & Sedikides, C. (2008). Retaliation as a response to procedural unfairness: A self-regulatory approach. *Journal of Personality and Social Psychology, 95*, 1511-1525.

Bulter, E. A., Lee, T. L., & Gross, J. J. (2009). Does expressing your emotions raise or lower your blood pressure?: The answer depends on cultural context. *Journal of Cross-Cultural Psychology, 40*, 510-517.

Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions (2nd ed. pp. 173-191)*. New York: Guilford.

Caplan, M., Bennetto, L., & Weissberg, R. P. (1991). The role of interpersonal

context in assement of social problem-solving skills. *Journal of Applied Developmental Psychology, 12*, 103-114.

Carolyn, S. (2004). The social context of emotion development. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions*. New York: Guilford Press.

Carver, C. S. (2004). Negative affects deriving from the behavioral approach system. *Emotion, 4*, 3-22.

Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review, 97*, 19-35.

Christie, I. C., & Friedman, B. H. (2004). Autonomic specificity of discrete emotion and dimensions of affective space: A multivariate approach. *International Journal of Psychophysiology, 51*, 143-153.

Clark, M. S. (1984). Record keeping in two types of relationship. *Journal of Personality and Social Psychology, 47*, 549-557.

Clark, M. S., & Finkel, E. J. (2004). Does expressing emotion promote well-being? It depends on relationship context. In L. Z. Tiedens & C. W. Leach (Eds.), *The social life of emotions (pp.105-126)*. New York, NY: Cambrige University Press.

Clark, M. S., Fitness, J., & Brissette, I. (2001). Understanding people's perceptions of relationship is crucial to understanding their emotional lives In G. Fletcher & M. S. Clark (Eds.), *Interpersonal processes: The blackwell handbook of social psychology (vol.3, pp. 253-278)*. New York: Blackwell Press.

Clark, M. S., Pataki, S. P., & Carver, V. (1996). *Some thoughts and findings on*

self-presentation of emotions in relationships. Mahwah, NJ: Erlbaum.

Cooper, A., Comez, R., & Buck, E. (2007). The relationship between the BIS and BAS, anger and responses to anger. *Personality and Individual Differences, 44*, 84-94.

Cooper, A., Gomez, R., & Buck, E. (2008). The relationship between BIS and BAS, anger and responses to anger. *Personality and Indivudal differences, 44*, 403-413.

Deffenbacher, J. L. (1992). Trait anger: Theory, findings, and implications. In C. D. Spielberger & J. N. Butcher (Eds.), *Advances in personality assessment (vol.9, pp. 177-201)*. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Derryberry, D., & Reed, M. A. (1994). Temperament and attention: Orienting toward and away from positive and negative signals. *Journal of Personality and Social Psychology, 66*, 1128-1139.

Drigotas, Whitney, & Rusbult (1995). On the peculiarities of loyalty: A diary study of responses to dissatisfaction in everyday life. *Personality and Social Psychology Bulletin, 21*, 596-609.

Dunn, J., & Herrara, C. (1997). Conflict resolution with friends, siblings, and mothers: A developmental perspective. *Aggressive Behavior, 23*, 343-357.

Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood: From striving for gains to maintenance and prevention of losses. *Psychology and Aging, 21*, 664-678. .

Edens, J. L., Larkin, K. T., & Abel, J. L. (1992). The effects of social support and physical touch on cardiovascular reactions to mental stress. *Journal of Psychosomantic Research, 36*, 371-382.

Ekman, P., & Friesen, W. V. (1978). *Manual of the Facial Action Coding System (FACS)* Palo Alto: Consulting Psychologists Press.

Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic nervous system activity distinguishes among emotions. *Science, 221*, 1208-1210.

Elliot, A. J. (Ed.). (2008). *Handbook of approach and avoidance motivation.* New York: Psychology Press.

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218-232.

Elliot, A. J., Gable, S. L., & Mapes, R. R. (2006). Approach and avoidance motivation in social domain. *Personality and Social Psychology Bulletin, 32*, 378-391.

Elliot, A. J., & Sheldon, K. M. (1998). Avoidance personal goals and the personality-illness relationship. *Journal of Personality and Social Psychology, 75*, 1282-1299.

Ellis, B., & Malamuth, N. (2000). love and anger in romantic relationships: A discrete systems model. *Journal of Personality, 68*, 526-558.

Fehr, B., & Harasymchuk, C. (2005). The experience of emotion in close relationships: Toward an integration of the emotion-in-relationships and

interpersonal script models. *Personal Relationships, 12*, 181-196.

Finkel, E. J., Molden, D. C., Johnson, S. E., & Eastwick, P. W. (in press). Regulatory focus and romantic alternative. In J. P. Forgus, R. F. Baumeister & D. M. Tice (Eds.), *Self-regulation: Cognitive, affective and motivational processes*. New York: Psychology Press.

Frijda, N. H., Ortony, A., Sonnesman, J., & Clore, G. L. (1992). The complexity of intensity: Issues concerning the structure of emotion intensity In M. S. Clark (Ed.), *Emotion: Review of personality and social psychology (No. 13., pp. 60-89)*. Thousand Oaks, CA: Sage.

Fung, H. H., Yeung, D. Y., Li, K. K., & Lang, F. R. (2009). Benefits of negative social exchanges for emotional closeness. *Journal of Gerontology: Psychological Science, 64*, 612-621.

Gable, S. L. (2006). Approach and avoidance social motives and goals. *Journal of Personality, 71*, 175-222.

Gable, S. L., & Poore, J. (2008). Which thoughts count? Algorithms for evaluating satisfaction in relationships. *Psychological Science, 19*, 1030-1036.

Gable, S. L., Reis, H. T., & Elliot, A. J. (2000). Behavioral activation and inhibition in everyday life. *Journal of Personality and Social Psychology, 78*, 1135-1149.

Galvin, K. M., & Cooper, P. J. (1990). *Development of involuntary relationships: The stepparent-stepchild relationship*. Paper presented at the the annual meeting of International Communication Association.

Goldstein, S. E., & Tisak, M. S. (2004). Adolescents' outcome expectation about relational aggression within acquaintanceship, friendships, and dating relationships. *Journal of Adolescence, 27*, 283-302.

Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion, 4*, 269-288.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(271-299).

Gross, J. J., John, O. P., & Richards, J. M. (2000). The dissociation of emotion expression from emotion exprience: A personality perspective. *Personality and Social Psychology Bulletin, 26*, 712-726.

Hamamura, T., & Heine, S. J. (2008). Approach and avoidance motivation across cultures. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation (pp. 549-562)*. New York: Psychology Press.

Hamiltin, W. D. (1964). The genetic evoluntion of social behavior. I and II. *Journal of Theoretical Biology 7*, 1-52.

Harmon-Jones, E., & Peterson, C. K. (2008). Effect of trait and state approach motivation and aggressive inclinations. *Journal of Research in Personality, 42*, 1381-1385.

Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology, 30*, 1-46.

Higgins, E. T., Roney, C. J. R., Crowe, E., & Hymes, C. (1994). Ideal versus ought predilections for approach and avoidance distinct self-regulatory systems.

Journal of Personality and Social Psychology, 66, 276-286.

Higgins, E. T., Shah, J., & Friedman, B. H. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology, 72*, 515-525.

Holmes, J. G., & Murray, S. L. (Eds.). (1996). *Conflict in close relationships*. New York: Guilford.

Holt-Lunstad, J., Uchino, B. N., Smith, T. M., Olson-Cerny, C., & Nealey-Moore, J. B. (2003). Social relationships and ambulatory blood pressure: Structural and qualitative predictors for cardiovascular function during everyday social interaction. *Health Psychology, 2003*, 388-397.

Huesmann, L. R. (1998). The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggresive behavior. In R. G. Geen & E. D. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy (pp. 73-110)*. San Diego, CA: Academic Press.

Ikkink, K., & van Tilburg, T. (1998). Do older adults' network member continue to provide instrumental support in unbalanced relationships? *Journal of Social and Personal Relationships, 15*, 59-75.

Impett, E., Gable, S. L., & Peplau, L. A. (2005). Giving up and giving in: The costs and benefits of daily sacrifice in intimate relationships. *Journal of Personality and Social Psychology, 89*, 327-344.

Impett, E., Parcet, M. A., & Gable, S. L. (2005). Approach and avoidance sexual

motives: Implications for personal and interpersonal well-being. *Personal Relationships, 12*, 465-482.

Izard, C. E. (1991). *The psychology and emotions*. New York: Plenum.

John, O. P., Donahue, E. M., & Kentle, R. L. (Eds.). (1991). *The Big Five Inventory--Version 4a and 54*. Berkeley, CA: University of California, Berkeley.

Kagitcibasi, C. (2002). A model of family change in cultural context. In W. J. Lonner, D. L. Dinnel, S. A. Hayes & D. N. Sattle (Eds.), *Online readings in psychology and culture (Unit 13, Chapter 1)*. Retrieved from http://www.wwu.edu/~culture.

Kassinove, H. (Ed.). (1995). *Anger disorders: Definition, diagnosis, and treatment*. Washington, DC: Taylor & Francis International Publishers.

Keller, J., Hurst, M., & Uskul, A. (2008). Prevention-focused self-regulation and aggresiveness. *Journal of Research in Personality, 42*, 800-820.

Kitayama, S., Markus, H. R., & Kurokawa, M. (2000). Culture, emotion, and well-being: Good feelings in Japan and the United States. *Cognition and Emotion, 14*, 93-124.

Kling, C. (1933). The role of the parasympathetics in emotions. *Psychological Review, 40*, 368-380.

Kohler, C. G., Turner, T., Stolar, N. M., Bilker, W. B., Brensinger, C. M. G., R. E., & Gur, R. C. (2004). Differences in facial expressions of four universal emotions. *Psychiatry Research, 128*, 235-244.

Kuppen, P., Mechelen, I. V., Smit, D. M., & De Boeck, P. (2003). The appraisal basis of anger: Specificity, necessity, and sufficiency of components. *Emotion, 3*, 254-269.

Lang, R. F., & Neyer, F. J. (2005). Social relationships as nature and nurture: A evoluntionary-psychological framework of social relationship regulaiton. *Zeitschrift fur Soxilogie der Erziebung and Sozialisation, 2*, 162-177.

Laursen, B. (1993). Conflict management among close peers. In B. Laursen (Ed.), *Close friendships in adolesence (pp.39-54)*. San Francisco: Jossey-Bass Publishers.

Lazarus, R. S. (1991). *Emotion and Adaption*. New York: Oxford University Press.

Levenson, R. W. (1992). Autonomic nervous system differences among emotions. *Psychological Science, 3*, 23-27.

Lieberman, D., & Linke, L. (2007). The effect of soical category on third party punishment. *Evolutionary Psychology, 5*, 289-305.

Lobbestael, J., Arntz, A., & Wiers, R. W. (2008). How to push someone's bottons: A comparison of four anger-induction methods. *Cognition and Emotion, 22*, 353-373.

Manstead, T. (2005). The social dimension of emotion. *The psychologist, 18*, 484-487.

Marci, C. D., Glick, D. M., Loh, R., & Dougherty, D. D. (2007). Autonomic and prefrontal cortex responses to autobiographical recall of emotions. *Cognitive, Affective & Behavioral Neuroscience, 7*, 243-250.

Maslow, A. H. (1955). Dificiency motivation and growth motivation. In M. R. Jones (Ed.), *Nebraska Symposium on Motivations (Vol. 3, pp. 1-30)*. Lincoln: University of Nebraska Press.

Matsumoto, D., Yoo, S. H., & Chung, J. (2009). The expression of anger across cultures. In M. Potegal, G. Stemmler & C. Splelberger (Eds.), *International handbook of anger: Constituent and concomitant biological, psychological, and social processes (pp. 125-137)*. New York: Springer.

Matsumoto, D., Yoo, S. H., Fontaine, J. R. J., Anguas-Wong, A. M., Arriola, M., & al., e. (2008). Mapping expressive differences arousal the world: The relationship between emotional display rules and individualism v. collectivism. *Journal of Cross-Cultural Psychology, 39*(1), 55-74.

Mauss, I. B., Bunge, S. A., & Gross, J. J. (2008). Automatic emotion regulation: Cultural and neuroscientific considerations. In S. Ismer, S. Jung, S. Kronast, C. van Scheve & M. Vanderkerchhove (Eds.), *Regulating emotions: Social necessity and biological inheritance*. London: Blackwell Publishing.

Mauss, I. B., Cook, C. L., Cheng, J. Y. J., & Gross, J. J. (2007). Individual differences in cognitive reappraisal: Experiential and physiological responses to an anger provocation. *International Journal of Psychophysiology, 66*, 116-124.

Mauss, I. B., Cook, C. L., & Gross, J. J. (2007). Automatic emotion regulation during anger provocation. *Journal of Experimental Social Psychology, 43*, 698-711.

Mehrabian, A. (1976). Questionnaire measures of affiliative tendency and sensitivity

to rejection. *Psychological Report, 38*, 199-209.

Miller, J. B., & Serrey, J. (1997). Rethinking women's anger: The personal and the global. In J. V. Jordan (Ed.), *Women's growth in diversity: More writings from the Stone Center* New York: Guilford.

Miller, T. Q., Smith, T. W., Turner, C. W., Guijarro, M. L., & Hallet, A. J. (1996). A meta-analytic review of research on hostility and physical health. *Psychological Bulletin, 119*, 322-348.

Mjelde-Mossey, L. A., Chi, I., & Lou, V. W. Q. (2006). Relationship between adherence to tradition and depression in Chinese elders in China. *Aging and Mental Health, 10*, 19-26.

Molden, D. C., & Finkel, E. J. (in press). Motivations for promotion and prevention and the role of trust and commitment in interpersonal forgiveness. *Journal of Experimental Social Psychology*.

Molden, D. C., Lee, A. Y., & Higgins, E. T. (2008). Motivations for promotion and prevention. In J. Shah & W. Gardner (Eds.), *Handbook of motivation science (pp. 169-187)*. New York: Guilford Press.

Molden, D. C., Lucas, G. M., Finkel, E. J., Kumashiro, M., & Rusbult, C. E. (2009). Perceived support for promotion-focused and prevention-focused goals: Associations with well-being in unmarried and married couples. *Psychological Science, 20*, 787-793.

Nealey-Moore, J. B., Smith, T. M., Uchino, B. N., Hawkins, M. W., & Olson-Cerny, C. (2007). Cardiovascular reactivity during positive and negative marital

interaction. *Journal of Behavior Medicine, 30*, 505-519.

Nealey-Moore, J. B., Smith, T. W., Uchino, B. N., Hawkins, M. W., & Chrisana, O. C. (2007). Cardiovascular reactivty during positive and negative marital interaction. *Journal of Behavioral Medicine, 30*, 505-519.

Neyer, F. J., & Lang, F. R. (2003). Blood is thicker than water: Kinship orientation across adulthood. *Journal of Personality and Social Psychology, 84*, 310-321.

Ortony, A., Clore, G. L., & Collins (1988). *The cognitive structure of emotions*. New York: Cambridge University Press.

Oveis, C., Cohen, A. B., Gruber, J., Shiota, M. N., Haidt, J., & Keltner, D. (2009). Resting respiratory sinus arrhythmia is associated with tonic positive emotionality. *Emotion, 9*, 265-270.

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*, 3-12.

Oyserman, D., Uskul, A., Yoder, N., Nesse, R. M., & Williams, D. R. (2007). Unfair treatment and self-regulatory focus. *Journal of Experimental Social Psychology, 43*, 505-512.

Peets, K., Hodges, E. V. E., Kikas, E., & Salmivalli, C. (2007). Hostile attributions and behavioral strategies in Children: Do relationship type matter? *Developmental Psychology, 43*, 889-900.

Piece, G. R., Sarason, I. G., & Sarason, B. R. (1991). General and relationship-based perception of social support: Are two constructs better than one? . *Journal of*

Personality and Social Psychology, 61, 1028-1039.

Ratnasingam, P., & Bishop, G. D. (2007). Social support schemas, trait anger, and cardiovascular responses. *International Journal of Psychophysiology, 63*, 308-316.

Ray, R. D., Wilhelm, F. H., & Gross, J. J. (2008). All in the mind's eye? Anger rumination and reappraisal. *Journal of Personality and Social Psychology, 94(1)*, 133-145.

Reinhardt, J. P., Boerner, K., & Benn, D. (2003). Predicting individual change in support over time among chronically impaired older adults. *Psychology and Aging, 18*, 770-779.

Reznik, I., & Anderson, S. M. (2007). Agitation and despair in relation to parents: Activating emotional suffering in transference. *European Journal of Personality, 21*, 281-301.

Rogers (1961). *On becoming a person.* Boston: Houghton Mifflin.

Rothtart, M. K., Derryberry, D., & Hershey, K. L. (2000). Stablity of temperament in childhood: laboratory infant assessment to parent report at 7 years. In V. J. Molfese & D. L. Molfese (Eds.), *Temperament and personality across the life span (pp. 85-119)*. Mahwah, NJ: edbaum.

Rothtart, M. K., Derryberry, D., & Posner, M. I. (1994). A psychobiological approach to the development of temperament. In J. E. Bates & T. D. Wachs (Eds.), *Temperament: Individual differences at the interface of biology and behavior (pp. 83-116)*. Washington, DC: American Psychological Association.

Rottenberg, J., Wilhelm, F. H., Gross, J. J., & Gotlib, I. H. (2002). Respiratory sinus arrhythmia as a predictor of outcome in Major Depressive Disorder. *Journal of Affective Disorders, 71*, 265-272.

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39*, 1161-1178.

Russell, J. A., Lewicka, M., & Niit, T. (1989). A cross-cultural study of a circumplex model of affect. *Journal of Personality and Social Psychology, 57*, 848-856.

Russell, J. A., & Mehrabian, A. (1978). Approach-avoidance and affiliation as functions of emotion-eliciting quality of an environment. *Environment and Behavior, 10*, 355-387.

Scherer, K. R. (1984). On the nature and fuction of emotion: A component process approach. In K. R. Scherer & P. Ekman (Eds.), *Approaches to emotion (pp. 293-317)*. Hillsdale, NJ: Erlbaum.

Seery, M. D., Weisbuch, M., & Blascovich, J. (2009). Something to gain, something to lose: The cardiovascular consequences of outcome frameing. *International Journal of Psychophysiology, 73*, 308-312.

Shah, J., Brazy, P. C., & Higgins, E. T. (2004a). Promoting us and preventing them: Regulatory focus and manifestations of intergroup bias. *Personality and Social Psychology Bulletin, 30*, 433-446.

Shah, J., Brazy, P. C., & Higgins, E. T. (2004b). Promoting us or preventing them: Regulatory focus and manifetation of ingroup bias. *Personality and Social Psychology Bulletin, 30*, 433-446.

Shah, J., & Higgins, E. T. (2001). Regulatory concerns and appraisal efficency: The general impact of promotion and prevention focus. *Journal of Personality and Social Psychology, 80*, 693-705.

Shaver, P. R., Wu, S., & Schwartz, J. C. (1992). Cross-cultural similarities and differences in emotion and its representation: A prototype approach. In M. S. Clark (Ed.), *Review of Personality and Social Psychology (vol. 13, pp. 175-212)*. Newbury Park, CA: Sage.

Sirrine, N. K., Lauricella, A. M., & Saveliev, K. A. (2005). *Is blood thicker than water?: Children's normative beliefs about aggression.* . Paper presented at the the biennial meeting of the Society for Research in Child Development, Atlanta, GA.

Smith, T. W. (1992). Hostility and health: Current status of a psychosomatic hypothesis. *Health Psychology, 11*, 139-150.

Smits, D. J. M., & De Boeck, P. D. (2007). From anger to verbal aggression: Inhibitation at different levles. *Personality and Individual Differences, 43*, 47-57.

Smits, D. J. M., & Kuppens, P. (2005). The relations between anger, coping with anger, and aggression, and the BIS/BAS system. *Personality and Individual Differences, 39*, 783-793.

Snydersmith, & Cacioppo (1992). Parising complex social factors to determine component effects: Autonomic activity and reactivity as a function of human association. *Journal of Social and Clinical Psychology, 11*, 263-278.

Spielberger, C. D., Crane, R. S., Kearns, W. D., Pellegrin, K. L., Rickman, R. L., & Johnson, E. H. (1991). Anger and anxiety in essential hypertension. In C. D. Spielberger & I. G. Saranson (Eds.), *Stress and emotion (Vol. 14: pp. 266-283)*. Hemisphere: Taylor and Francis.

Spitzer, S. B., Liabre, M. M., Ironson, G. H., Gellman, M. D., & Schneiderman, N. (1992). The influence of social situations on ambulatory blood pressure. *Psychosomatic Medicine, 54*, 79-86.

Strachman, A., & Gable, S. L. (2006). What you want (and don't want) affect what you see (and don't see): Avoidance social goals and social events. *Personality and Social Psychology Bulletin, 32*, 1446-1458.

Sumrall, S. G., Ray, G. E., & Tidwell, P. S. (2000). Evaluations of relational aggression as a function of relationship type and conflict setting. *Aggressive Behaviors, 26*, 179-191.

Takagi, K. (2005). *Approach-avoidance goals and psychological well-being, health, and interpersonal relationship outcomes across Euro-Canadian, Japanese, and Mexican cultures*.Unpublished manuscript, University of British Columbia.

Tangney, J. P., Hill-Barlow, D., Wagner, P. E., Marschall, D. E., Borenstein, J. K., Sanftner, J., et al. (1996). Assessing individual differences in constructive versus destructive responses to anger across life span. *Journal of Personality and Social Psychology, 70*, 780-796.

Thomas, S., Smucker, C., & Droppleman, P. (1998). It hurts most around the heart: A

phenomeological exploration of women's anger. *Journal of Advanced Nursing, 28*, 311-322.

Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: The effect of negative emotion expression on social status conferral. *Journal of Personality and Social Psychology, 80*, 86-94.

Tsai, J. L. (2007). Ideal affect: Cultural causes and behavioral consequences. *Perspectives on Psychological Science, 2*, 242-259.

Tsai, J. L., Chentsova-Dutton, Y., Friere-Bebeau, L. H., & Przymus, D. (2002). Emotional expression and physiology in European Americans and Hmong Americans. *Emotion, 2*, 380-397.

Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology, 90*, 288-307.

Tsai, J. L., Levenson, R. W., & Carstensen, L. L. (2000). Autonomic, subjective, and expressive responses to emotional films in older and younger Chinese Americans and European Americans. *Psychology and Aging, 15*, 684-193.

Uchino, B. N., T., C. J., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119*, 488-531.

Updergraff, J. A., Gable, S. L., & Taylor, S. E. (2004). What makes experiences satisfying? The interaction of approach-avoidance motivations and emotions in well-being. *Journal of Personality and Social Psychology, 86*, 496-504.

Updergraff, K. A., & Obeidallah, D. A. (2001). Young adolescents' patterns of involvment with siblings and friends. *Social Development, 8*, 52-69.

Van Mechelen, I., & Hennes, K. (2009). The appraisal basis of anger occurrence and intensity revised. *Cognition and Emotion*(23(7)), 1373-1388.

Vangelisti, A. L., & Crumley, L. P. (1998). Reactions to messages that hurt: The influence of relational contexts *The social life of emotion.*

Vangelisti, A. L., & Maguie, K. (2002). Hurtful messages in family relationships: When he pain lingers. In J. H. Harvey & A. Wenzel (Eds.), *A clinician's guide to maintaining and enhancing close relationships (pp. 43-62)*. Mahwah, NJ: Lawrence Erlbaum.

Wellman, B., Yuk-Lin Wong, R., Tindall, D., & Nazer, N. (1997). A decade of network change: Turnover, persistence, and stability in personal comunities. *Social Networks, 19*, 27-30.

Why, Y., & Johnston, D. W. (2008). Cynicism, anger and cardiovascular reactivity during anger recall and human-computer interaction. *International Journal of Psychophysiology, 68*, 219-227.

Wingrove, J., & Bond, A. J. (1998). Angry reactions to failure on a cooperative computer game: The effect of trait hosility, behavioral inhibition, and behavioral activation. *Aggressive Behaviors, 24*, 27-36.

Wong, S., Bond, M. H., & Mosquera, P. M. R. (2008). The influence of cultural value orientation on self-reported emotional expression across cultures. *Journal of Cross-Cultural Psychology, 39*, 224-229.

Yang, K. S. (1993). Chinese social orientation: A social-interactive perspective. . In K. Yang (Ed.), *Chinese psychology and behavior: Indigenous research (pp. 87-121)*. Taipei: Guiguan Publisher.

Yik, M., & Russell, J. A. (2003). Chinese affect circumplex: I. Structure of recalled momentary affect. *Asian Journal of Social Psychology, 6*, 185-200.