

Cyclothymic Hypersensitive Temperament, Emotion Regulation, Positive and Negative Affects, and Attachment Style in a Non-Clinical Sample: Gender and Ethnic Differences and Predictors

Siamak Khodarahimi*

Eghlid Branch, Islamic Azad University

Intan H. M. Hashimah, & Norzarina Mohd-Zaharim

Universiti Sains Malaysia

**Siamak Khodarahimi; Psychology Department; Eghlid Branch; Islamic Azad University, Eghlid Iran; Khodarahimi@yahoo.com (e-mail).*

ABSTRACT - The purpose of this research was to examine the validity of cyclothymic hypersensitive temperament (CHT) and its relationships with emotional functioning and attachment style and to investigate the roles of gender and ethnicity in these relationships. Participants were 308 undergraduate students from a public university in Malaysia. A demographic questionnaire and four self-rated measures were used in this study. Resulting data demonstrated that CHT is a multidimensional construct with nine factors. Emotion regulation was significantly positively correlated with hypersensitivity and mood cyclicity subscales and they were negatively related to risky urge subscale of CHT. Positive and negative emotions were significantly positively related to mood cyclicity, hyperemotionality, composure inability, impulsivity and CHT. Fearful preoccupied and dismissing attachment styles were related to the CHT and its dimensions with different degrees. Gender and ethnicity influenced two of CHT and attachment subscales. Positive emotion, preoccupied and fearful styles altogether explained 16 percent of variance in CHT.

Many scholars within the fields of philosophy, psychology and biology endorse the importance of temperament in guiding and influencing human behavior. Temperament can be viewed as a constitutional and inherited model that usually concerns individual differences in emotional tendencies, emotional nature and the quality of the prevailing moods (Allport, 1961; Cloninger, Svrakic, & Przybeck, 1993; Goldsmith et al., 1987). This approach is one aspect of personality traditions in psychology that is interested in the individual's emotional predispositions and susceptibility to emotional stimuli and all the peculiarities of fluctuation and intensity of mood (Chess & Thomas, 1989; Talwar, Nitz & Lerner, 1991; Zamani-Zarghani, 1988).

Cyclothymic Hypersensitive Temperament (CHT)

Although modern technologies and advanced research have attempted to identify the possible genetic factors underlying the temperament types that may have a crucial role in mental health, the findings are far from conclusive (Berk & Dodd, 2005; Evans et al., 2005; Mendlowicz et al., 2005). Kraepelin (1921) was the first person to recognize the role of CHT in bipolar affective disorder. Based on his conceptualizations, Akiskal and his colleagues (1989, 1998) have identified four temperaments as the affective predisposition or reactivity which he called hyperthymic, depressive, irritable and CHT. Since the bipolar affective disorder is characterized by at least one hypomanic and depressive episode, Perugi and colleagues (2003) indicated that bipolar disorder and its depressive mood reactivity and interpersonal sensitivity symptoms may be related to CHT.

CHT is mostly differentiated by rapid and frequent swings between sad and cheerful moods and irritability. Investigations revealed that dark hypomania in the bipolar disorder is associated with CHT in adults, adolescents and children samples (Benazzi, 2004; Kochman et al., 2005). Specifically, Kochman found evidence that these patients were suffering from a special form of bipolar disorder that is characterized by rapid mood shifts with associated conduct disorders, aggressiveness, psychotic symptoms and suicidality. Correll et al. (2007) indicated that the CHT could predict alteration in BPD in youths with a current or past diagnosis of depression. Current findings showed that CHT is the subsyndromal manifestation and commonly the antecedent for minor and major mood disorders. As such, it has been considered a sub-threshold variant of bipolar affective and depressive disorders. It also has been linked to eating and sleeping disorders, alcoholism and HIV (Pacini et al., 2009; Perretta et al., 1998; Pompili et al., 2009; Signoretta, Maremmani, Liguoi, Perugi, & Akiskal, 2005).

Research indicated that up to twenty percent of the population has some kind of marked temperaments but CHT is more frequent in women and mediated by psychological factors such emotions (Rihmer, Akiskal, Rihmer, & Akiskal, 2010; Sakai et al., 2009; Sanson & Rothbart, 1995). With respect to the backgrounds of temperament types, the objectives of the present study were (1) to investigate CHT, emotion regulation, positive and negative emotions and attachment style in a non-clinical sample, and (2) to explore the construct validity of the CHT and its correlated constructs.

Chiaroni, Hantouche, Gouvernet, Azorin, and Akiskal (2005) compared CHT among control and clinical groups and then postulated it as representing a behavioral endophenotype, serving as a link between molecular and behavioral genetics and as more prevalent among women. In a more sophisticated conceptualization, Stahl (2008) argued that cyclothymic disorder as characterized by mood swings is less severe than full bipolar disorder but still moves above and below the boundaries of normal mood. CHT might be a lesser degree of variation from normal mood that is stable and persistent. It is a lifelong personality style that specifies how an individual responds to his or her environmental stimuli. Stahl (2008) further claimed that CHT has heritable patterns which are present early in life and persist thereafter and include independent personality dimensions such as novelty seeking, harm avoidance and conscientiousness. Stahl (2008) suggested that this type of temperament may carry vulnerability to mood disorders, especially bipolar

spectrum disorders. Similar findings by Gonda et al. (2009) supported a possible multifaceted CHT with variability, cyclicity, instability and intensity components. Perretta et al. (1998) assumed that pre-morbid risk-taking traits besides CHT may play an important role in drug use and high-risk sexual behaviors. In addition, Akiskal (1995) revealed that adolescents with CHT manifest a higher mood-lability, emotional over-reactivity, emotional aggression, erratic behavior and hypersensitivity.

Alloy et al. (2006) proposed a behavioral approach system (BAS) of hypersensitivity that may explain hypersensitive temperament in individuals with bipolar spectrum disorders and non-clinical populations. According to this hypersensitivity model, individuals with bipolar disorders have a hyper-sensitive BAS that is vulnerable to the extreme fluctuations in activation and deactivation of emotional functioning and finally resulting in bipolar and depressive symptoms. Similarly, Perugi et al. (2006) linked CHT to lability and sensitive features including mood instability, impulsivity, identity disturbance, avoidance of abandonment and interpersonal sensitivity or reactivity, and so forth that derive from a severe and far-ranging affective dysregulation mechanism.

In a combinative model from temperament and emotion interrelatedness functions, Whittle, Allen, Lubman, and Yücel (2006) suggested that specific areas of the prefrontal cortex and limbic structures are key regions associated with three fundamental dimensions of temperament: negative affect, positive affect, and constraint. Similarly, Lara, Lorenzi, Borba, Silveira and Reppold (2008) indicated that there are more females with CHT but this rate declines slightly with age. They noted that cyclothymic, dysphoric and irritable temperaments highly overlap but CHT is accompanied by more externalizing features. They explained that temperament functions are related to self-regulation of activation and inhibition which are linked to frontal lobe functions of both emotion regulation and behavioral adaptation. Pacini et al. (2009) argued that affective temperaments should be considered as elements of an affective pattern that persists regardless of presenting mental illness. These findings altogether adhere to the role of emotion regulation and positive-negative emotions in CHT.

Emotion Regulation

Emotion regulation conceptualizations often distinguish between two strategies of emotional regulation for both positive and negative emotions through reappraisal and suppression mechanisms (Gross, 1998; Lam, Dickerson, Zoccola, & Zaldivar, 2009; Nezlek, Van Mechelen, Vansteelandt, & Kuppens, 2008). Emotion regulation through reappraisal was found to be beneficial, and regulation by suppression was not. Reappraisal of positive emotions was associated with increased positive affect and psychological adjustment, whereas the suppressing positive emotions were linked with increased negative emotions and psychological dysfunctions. In an appraisal model, each emotion—either negative or positive—can be traced to a set of appraisals that cause the emotion and operate as a central part of emotion regulation (Macklem, 2008; Scherer, 2001).

Negative and Positive Emotions

Negative emotions include apathy, grief, fear, shame, blame, etc. In contrast, positive emotions encompass enthusiasm, boredom, empathy, activity, curiosity, etc. Fredrickson

(1998) speculated that the evolutionary nature of these different emotions will determine their practical functions in human life. Fredrickson noted that both of them are unique adaptations in the evolution, and they do not provide inherent protection for humankind. Negative and positive emotions are assumed to be markers of illness and well-being, and positive emotions are merely offsets to negative emotions in order to enrich life. Fredrickson articulated that only positive emotions could expand cognition and behavioral tendencies. Therefore, emotions should be cast as leading to changes in “momentary thought-action repertoires” (Fredrickson, 1998, 2000, 2003, 2009).

Attachment Style

Aforementioned literature assumed that temperaments such as CHT are typically best understood on a biological basis such as genetic heritability. However, others (e.g., Rothbart, Ahadi, & Evans, 1994; Vaughn & Bost, 1999) suggested that types of temperament may be derived from an individual’s state in the development of attachment. Bowlby (1982) recognized the evolutionary significance of attachment and explained its protective role in development. Although the attachment system is most noticeable and important early in life, he claimed that it continues to be active over the entire life span (Bowlby, 1982, 1988). Bowlby (1982) called attachment as a *safe haven* in times of distress and a *secure base* for exploration that enhances personal growth (Bowlby, 1988). Human beings seek a haven of safety when the world seems dangerous, and they seek encouragement for autonomy and self-expansion when the world offers interesting challenges that might facilitate the development of knowledge and skills. Bowlby (1982) claimed that secure behavioral tendencies are organized by an innate *caregiving behavioral system* whose goal is to reduce other people’s suffering, protect them from harm, and foster their growth and development (Gillath, Shaver, & Mikulincer, 2005). Such an empathic stance includes what attachment theorists call sensitivity and responsiveness. Sensitivity includes attunement and accurate interpretation of another person’s signals of distress, worry, or need. Responsiveness includes generous intentions; validating the troubled person’s needs and feelings; respecting his or her beliefs, attitudes, and values; and helping the person feel loved, understood, and cared for (Reis & Shaver, 1988).

Adult attachment theories identify secure and insecure patterns on the basis of three main classifications: autonomous, preoccupied, and dismissing (Main & Goldwyn, 1985/1991). These classifications often reflect differences in mental representations that are based on differences in attachment experiences. Vaughn et al. (1992) addressed a plausible interaction between temperament and attachment that can be conceptualized within the internal working model of attachment. Then, they combined several studies on the relationship between temperament and attachment in children and concluded that there is some overlap between them. De Haas, Bakermans-Kranenburg, and Van Ijzendoorn (1994) suggested that temperament may be seen as an important brick in the development of personality and required to differentiate the internal working model of attachment styles. They investigated their assumptions but did not find any temperament differences between the three autonomous, preoccupied and dismissing patterns of attachment. They argued that temperament and attachment are two relatively independent constructs in adulthood. However, later evidence suggested that children with secure

attachments are actually children with easy temperaments and children with insecure attachments have difficult temperaments (Karen, 1998).

Present Study

Signoretta et al. (2005) demonstrated that individuals with CHT reported a higher number of emotional and behavioral problems than individuals with other temperaments. Akiyama et al. (2005) found the largest variance in nonclinical population for cyclothymic traits in Japan. They accounted this fact by extremes of mood traits which characterize the personality traits in this Japanese sample. Akiskal and colleagues have published empirical data that support a significant role of socio-physiology in the phenotype of mood and temperament states (Akiskal, Hantouche, & Allilaire, 2003; Akiskal, & Akiskal 2005; Niculescu & Akiskal, 2001). In line with them, Maina, Salvi, Rosso and Bogetto (2010) affirmed that patients with CHT had an earlier age of onset and a higher family history for bipolar disorder than patients without any dominant affective temperament. Although there is a lack of evidence for attachment styles and CHT in non-clinical populations, recent research concluded that abnormal attachment is not the consequence of a difficult temperament and both temperament and attachment play crucial roles in challenging behavior (Kaiser & Rasminsky, 2009).

However, despite of the lack of evidence about CHT, emotion regulation, positive and negative emotions and attachment style, significant relationships between them have been suggested. Since research showed a few important features in CHT symptomatology, the present study suggested CHT to be a multidimensional construct that may also exist in non-clinical populations. Perhaps some specific dimensions of CHT would relate to emotions regulations and positive and negative emotions. Additionally, it was speculated that both CHT and attachment style have onset and developmental origins in childhood and they often relate to each other. Therefore, the present study suggested significant relationships between them and predicted that they are influenced by the developmental linked factors such as gender and ethnicity.

The first hypothesis of the present study is that CHT has a multidimensional nature in a non-clinical sample. The second hypothesis of this study is that CHT, emotion regulation, positive-negative emotions and attachment style have significant relationships among university undergraduate students. The third hypothesis of this study is that gender and ethnicity influence CHT, emotion regulation, positive-negative emotions and attachment style in undergraduate students. The fourth hypothesis of this study is that emotion regulation, positive and negative emotions and attachment style variables can predict CHT in this sample.

Method

Participants

Participants were 308 undergraduate students (male $n = 67$ and female $n = 241$) at a public university in Malaysia. The means of age for males and females were 22.35 ($SD = 3.36$) and 21.85 ($SD = 1.31$), respectively. Participants were selected from those taking a psychology course as a requirement for their minor program. As such, students were from various departments/schools in the university and from different years of study. Students

received extra-credit for their participation in the study. After informed consent was obtained, participants completed a questionnaire with five sections.

Instruments

The demographic questionnaire included age, gender, religion, ethnicity, major and department/school, marital status, order of birth, number of siblings, and family size. The four inventories used were: (1) the Cyclothymic Hypersensitive Temperament Questionnaire (CHTQ), (2) the Emotion Regulation Questionnaire (ERQ), (3) Positive and Negative Affect Schedule (PANAS), and (5) the Relationship Scales Questionnaire (RSQ).

Cyclothymic Hypersensitive Temperament Questionnaire (CHTQ). The CHTQ (Kochman et al., 2005) is a semi-structured format for measuring CHT and made up of 25 items, and for each item the participant has to answer "Yes" or "No." Kochman et al. (2005) noted that they adapted the CHTQ from Akiskal's construct of cyclothymic temperament in adults (Akiskal & Mallya, 1987; Akiskal et al., 1979).

Emotion Regulation Questionnaire (ERQ). The ERQ (Gross & John, 2003) measures two emotion regulation strategies: reappraisal and suppression. Reappraisal is a cognitive strategy involving reinterpretation of a potentially emotion-eliciting situation into a situation with a different emotional impact. Suppression is a way of response modulation involving inhibition of emotion-expressive behavior. The scale consists of 10 items (6 reappraisal items and 4 suppression items). Higher scores indicate more frequent use of each strategy. Participants reply to all items using a scale ranging from 1 (strongly disagree) to 7 (strongly agree). Gross and John (2003) demonstrated ERQ validity via factor analysis. Reliability by Cronbach's alpha for both reappraisal and suppression factors ranged from .73 to .88 (Gross & John, 2003; Phillips et al., 2009).

Positive and Negative Affect Schedule (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) has 20 items that include positive affect (PANAS-P; 10 items) and negative affect (PANAS-N; 10 items). It was developed with a sample of undergraduate students and applied in adult populations. Items from the PANAS-P are interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active. Items from the PANAS-N include distressed, upset, hostile, irritable, scared, jittery, afraid, ashamed, guilty, and nervous. The PANAS was developed to be a brief measure of positive and negative affect. Respondents are asked to indicate to what extent they have experienced each specific emotion in the past week. Each item is rated on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (very much or extremely). There has been considerable support for the construct validity of the PANAS. Furthermore, estimates of internal consistency have been found to range from .86 to .90 for the positive affect scale, and from .84 to .97 for the negative affect scale (Watson et al., 1988; Chorpita, Daleiden, Moffitt, Yim, & Umemoto, 2000).

Relationship Scales Questionnaire (RSQ). This 30-item instrument provides a continuous measure of one's subjective characteristic style in close relationships and measures four dimensions: secure, fearful, dismissing and preoccupied subscales (Griffin & Bartholomew, 1994). Secure style indicates positive views of self and others. Fearful relationship style indicates negative perceptions of self and others. Preoccupied style is defined by a negative view of self and a positive view of others. Dismissing style

indicates high levels of self-confidence and negative views of others. This measure has been demonstrated to have strong convergent and divergent validity (Griffin & Bartholomew, 1994).

Results

Initial analysis of data included a factor analysis that was conducted to evaluate possible multidimensional nature of CHT and its construct validity in a non-clinical sample. Principal factor analysis with varimax rotation was used to determine construct validity, considering Eigenvalues higher than 1. Factor analysis specification was satisfactory, $KMO = .71$, *Bartlett's Test of Sphericity* = 884, $df = 300$, $p = .0001$, *Rotation Sums of Squared Loadings* = 50.26. Table 1 shows significant rotated correlations higher than .30 for 25 items in 15 iterations. Factor analysis indicated that CHT consisted of nine factors with Eigenvalues ranging from 1 to 3.49. These nine factors explained 56.11% of variance. They were hypersensitivity, mood cyclicality, attention seeking, hyperemotionality, composure inability, excitation variability, impulsivity, risk urge, and instability (see Table 2). Criterion validity was established based on the correlation between CHT and PANAS ($r = .27$). Reliability by Cronbach's alpha was over .98 for all factors and .93 for the total scale. There were gender differences only for irritability and excitation variability, males had higher scores than female.

Table 1
Rotated Component Matrix of CHT Questionnaire

Factors	1	2	3	4	5	6	7	8	9
1	.652								
2						.501			
3	.561								
4	.602								
5				.732					
6						.424			
7						.513			
8			.364						
9		.571							
10									.884
11							.615		
12		.711							
13								.674	
14							.520		
15					.710				
16					.810				
17	.487								
18			.660						
19		.593							
20				.585					
21				.494					
22						.643			
23							.666		
24			.689						
25		.545							

To test the second hypothesis, a correlational analysis was conducted to evaluate relationships between CHT, emotional regulation, positive and negative emotions and attachment styles. This analysis assessed the degree that these variables were positively and linearly related. The analysis indicated that emotional reappraisal and suppression were significantly positively correlated with hypersensitivity and mood cyclicality subscales of CHT while emotional reappraisal and suppression were negatively related to risky urge subscale of CHT. Positive and negative emotions were significantly positively and linearly related to mood cyclicality, hyperemotionality, composure inability, impulsivity and CHT. In addition, negative emotions were significantly positively related to hypersensitivity. There were no significant relationships between secure style and CHT, except in hypersensitivity subscale that was negative. Fearful style was significantly positively related to hyperemotionality, composure inability, excitability swing and CHT. Preoccupied style was significantly positively correlated with mood cyclicality, composure inability, impulsivity, risky urge and CHT. Dismissing style was only significantly positively associated with impulsivity subscale of CHT.

Table 2
Factors and Items

Factors	Items	Cumulative %
1. Hypersensitivity	1, 3, 4, 17	13.976
2. Mood Cyclicality	9, 12, 19, 25	21.258
3. Attention Seeking	8, 18, 24	27.341
4. Hyperemotionality	5, 20, 21	32.925
5. Composure Inability	15, 16	38.278
6. Excitation Variability	2, 6, 7, 22	43.229
7. Impulsivity	11, 14, 23	47.766
8. Risky Urge	13	52.105
9. Instability	10	56.118

All of CHT subscales were significantly positively related to CHT total scale (see Table 3). The third hypothesis of this research study was that gender and ethnicity influence CHT, emotional regulation and positive and negative emotions. A t-test for independent groups was conducted to compare means between gender, and an ANOVA was run for ethnic differences in aforementioned variables. Findings indicated males had significantly higher hypersensitivity, $t(292) = 2.57, p = .01$, excitation variability, $t(304) = 4.42, p = .0001$, and emotion reappraisal than females, $t(300) = 2.52, p = .01$. There were significant ethnic differences in mood cyclicality, $F(2, 247) = 9.57, p = .0001$, and excitation variability, $F(2, 249) = 3.82, p = .02$. Post-hoc test by *LSD* indicated that the Malays had higher mood cyclicality than the Chinese and other ethnic groups. Also, the Malays had significantly lower excitation variability than the Chinese and other ethnic groups. Additionally, to examine possible gender and ethnicity interaction, a multivariate analysis of variance (MANOVA) was conducted with gender, ethnicity and their interactions as independent variables and CHT, emotional regulation and positive and negative emotions as dependent variables. There were gender differences in excitation variability, fearful and dismissing styles with males having higher means than females, $Wilks' k = .846, F(18, 195) = 1.97, p = .01$. Ethnic differences were found in mood

Table 3
Emotional Regulation, Positive and Negative Emotions, Personal Values, Perceived Social Support, and Subjective Interpersonal Relationships Correlations

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	GHT			
1. Reappraisal	.556**																			
2. Suppression	-.069	-.042																		
3. Positive affect	.032	.025	.835**																	
4. Negative affect				.071	.068															
5. Secure style				.005	.229**															
6. Fearful style					-.218**															
7. Preoccupied style						.080														
8. Dismissing style							.352**													
9. Hypersensitivity							.197**	.024												
10. Mood cyclicity									.154**											
11. Attention seeking									-.055											
12. Hyperemotionality									.171**											
13. Composure instability										.153**										
14. Excitability swing											.092									
15. Impulsivity												.102								
16. Risky urge													.134*							
17. Instability														.073						
															.060					
																.741**				
																	.415**			
																		.323**		
																			.303**	
																				.307**

Note: * $p \leq .05$, ** $p \leq .01$

cyclicality and excitation variability, *Wilks' k* = .768, $F(36, 390) = 1.52$, $p = .03$. Gender and ethnicity interactions effects, *Wilks' k* = .803, $F(36, 390) = 1.25$, $p = .15$, were not significant. These findings indicated that the Malays had higher mood cyclicality and lower excitation variability than the Chinese and other ethnic groups (see Table 4).

Table 4
MANOVA Tests of Between-Subjects Effects

Dependents	Gender		Ethnicity	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Reappraisal	1.759	.186	.596	.552
Suppression	.281	.597	6.364	.002
Positive affect	.322	.571	.990	.373
Negative affect	1.361	.245	.682	.507
Secure	2.129	.146	.275	.760
Fearful	7.868	.005	3.648	.028
Preoccupied	.051	.821	.052	.949
Dismissing	1.574	.211	.374	.689
Hypersensitivity	.521	.471	2.248	.108
Mood Cyclicality	.299	.585	.396	.673
Attention Seeking	.638	.425	.382	.683
Hyperemotionality	.245	.621	.107	.899
Composure Inability	.001	.970	2.369	.096
Excitation Variability	.062	.803	2.327	.100
Impulsivity	1.563	.213	.602	.549
Risky Urge	6.364	.012	.801	.450
Instability	.736	.392	1.009	.366
CTHT	8.812	.003	2.749	.066

Finally, the results from the multiple regression analysis for the fourth hypothesis revealed that positive emotion, preoccupied and fearful styles altogether explained 16 percent of variance in CHT, and that all predictors had positive relationships with CHT (see Table 5).

Table 5
Cyclothymic Hypersensitive Temperament Predictors in the Total Sample

Dependent	Predictors	<i>R</i>	<i>R</i> ²	<i>Beta</i>	<i>t</i>	<i>p</i>
Cyclothymic Hypersensitive Temperament	Positive emotion	.297	.088	.297	5.06	.0001
	Positive emotion	.347	.140	.259	4.45	.0001
	Preoccupied style			.231	3.97	.0001
	Positive emotion	.399	.159	.235	4.02	.0001
	Preoccupied style			.220	3.81	.0001
	Fearful style			.140	2.42	.01

Discussion

Data for the first hypothesis demonstrated that CHT is a multidimensional construct with nine factors including: hypersensitivity, mood cyclicality, attention seeking, hyperemotionality, composure inability, excitation variability, impulsivity, risk urge, and instability. Although there was no previous evidence due to CHT multifaceted nature, the

present findings were in line with Stahl's (2008) notions of mood multiple boundaries. As Perretta et al. (1998) noted earlier, this multidimensional nature can explain the role of CHT in risk taking behavior. Theoretically, the multidimensional nature of CHT in this study encompasses all main features of behavioral endophenotype, behavioral approach system, affective dysregulation, developmental and affective models in previous studies (Chiaroni et al., 2005; Alloy et al., 2006; Perugi et al., 2006; Lara et al., 2008; Pacini et al., 2009). Obviously, this conceptualization needs further investigations into mediating effects of development cohorts in clinical and non-clinical populations across cultures, and the roles of its different factors in abnormal psychology such as mood disorders, impulsivity and violence, high risk behaviors, and substance abuse. Also, this multifaceted nature of CHT should be examined in relation to other types of temperament in future research.

Data for the second hypothesis indicated that both emotional reappraisal and suppression were significantly positively correlated with hypersensitivity and mood cyclicality subscales, and they were negatively related to risky urge subscale of CHT. Both positive and negative emotions were significantly positively and linearly related to mood cyclicality, hyperemotionality, composure inability, impulsivity, and CHT. Fearful preoccupied and dismissing attachment styles were related to CHT and its dimensions with different degrees. These findings were consistent with earlier studies that implicitly accounted for the interrelatedness between CHT, emotion regulation, positive and negative emotions and attachment styles (Bowlby, 1982; De Haas et al., 1994; Karen, 1998; Maina et al., 2010; Pacini et al., 2009; Signoretta et al., 2005; Whittle et al., 2006; Vaughn, & Bost, 1999; Vaughn et al., 1992). All of these findings highlight some environmental origins of CHT beyond the biological approach. Perhaps there is a need to rethink this concept as a biological predisposition that is influenced by emotional functioning and attachment style as products of environment, especially as shown by significant caregivers and familial subcultures. More exploration of this differentiation requires examining CHT, emotional functioning and attachment styles within behavioral genetic models and experimental procedures among biologically close relatives such as twins and siblings. However, cross-cultural comparisons can help to identify the effects of emotional functioning and attachments on CHT within subcultures.

Data for the third hypothesis indicated that males had higher scores than females in excitation variability and fearful and dismissing styles, and that the Malays had higher mood cyclicality and lower excitation variability than the Chinese and other ethnic groups. These findings are congruent with our conceptualization of CHT and attachment styles because gender and ethnicity are two elements of culture and socio-physiology of mood and temperament states (Akiskal et al., 2003; Akiskal & Akiskal 2005; Akiyama et al., 2005; Niculescu & Akiskal, 2001). It seems that both gender-linked roles and ethnic identity explain these differences across societies.

Finally, data for the fourth hypothesis indicated that positive emotion and preoccupied and fearful styles combined explained 16 percent of variance in CHT. Since CHT, emotional functioning and attachment have an infantile and childhood onset; there is a plausible bio-psychosocial explanation for them. In this model, initially the biological heritage makes up the individual capabilities for CHT, attachment and emotional functions via behavioral genetic and neuropsychological hardwires such as limbic system

and frontal and temporal lobes. Then, psychosocial experiences during infancy and childhood might result in excitation or inhibition mechanisms within neuropsychological structures which are responsible for emotional functions. This, in turn, specifies different temperament, attachment and emotional varieties eventually. Therefore, as expected, attachment and emotions can predict CHT and its subscales.

In conclusion, the current research adds to the psychology literature because it explored CHT's multifaceted nature, its relationships with emotional functioning and attachment style, and the influence of gender and ethnicity on CHT in an Asian sample. However, the present study was limited by its reliance on correlational data in an undergraduate and non-clinical sample. Future research should apply experimental and longitudinal designs and examine these constructs across different cultural samples in both clinical and non-clinical populations.

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