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Cognitive and affective components of empathy and their relationship with
personality dimensions in a Chinese sample

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Abstract

Empathy is an essential component of social interactions and may be related to personality characteristics. However, this issue has not been extensively examined in a Chinese sample. Students at six Universities in China ($N = 257$) completed the *Interpersonal Reactivity Index* (IRI), the *Eysenck Personality Questionnaire-Revised* (EPQ-R), and the *Depression, Anxiety and Stress Scales* (DASS-21). Using multiple regression analyses, and after accounting for demographic variables (sex and age), it was found that the affective empathy component Personal Distress positively predicted EPQ-R Neuroticism scores ($\beta = .49$), negatively predicted Extraversion ($\beta = -.21$) and Lie scale scores ($\beta = -.22$), as well as positively predicting DASS-21 Depression ($\beta = .26$), Anxiety ($\beta = .34$), and Stress scores ($\beta = .39$). Empathic Concern positively predicted Lie scale scores ($\beta = .21$), while negatively predicting Psychoticism scores ($\beta = -.24$). Individuals with high scores on Empathic Concern were also found to score more highly on Fantasy, Personal Distress, Neuroticism, Stress, and Anxiety. Thus, more empathic individuals are likely to experience elevations in negative affectivity when they perceive others' emotional suffering.

Keywords: Empathy; Personality; Negative affects; Chinese

Introduction

Empathy is crucial for adaptive interpersonal interactions and it impacts upon the social and occupational lives of individuals (Batson, 2009; Davis, 1983; Ekman, 2003). The different aspects of empathy, such as perspective taking, affect sharing, feeling concern for others, and understanding another's situation, suggest that empathy is a complex and multidimensional construct (Hoffman, 2007; Reniers, Corcoran, Drake, & Vollm, 2011). At a fundamental level, however, empathy is generally regarded as consisting of cognitive and affective processes that allow an individual to perceive the positive and negative feelings of another person (Hoffman, 2007). Individuals differ in the level of empathy that they have towards others (Basel & Yuille, 2010), but changes in dispositional empathy may occur over time in the same individual (Konrath, O'Brien, & Hsing, 2011). Sex differences have been relatively consistent across different ages and ethnic groups, with females reporting significantly greater empathic responsiveness than males (Hoffman, 1977; Neumann, Boyle, & Chan, 2013; Wang, Neumann et al., 2013). Moreover, one's level of empathy may be related to, and vary according to, relatively stable personality traits (e.g., Carlozzi, Bull, Eells, & Hubert, 1995; Grynberg, Luminet, Corneille, Grèzesb, & Berthoz, 2010).

With regard to the human personality structure, the validity of various models have been debated (e.g., the "Big Five" model; see Cattell, 1995; Boyle, 2008). However, the two dimensions of extraversion and neuroticism are widely accepted and appear in the most established models of broad personality traits (Boyle, 2008). Consequently, in the present study, the Eysenck Personality Questionnaire-Revised (EPQ-R) was used to measure personality. The EPQ-R trait measures three dimensions: Extraversion Neuroticism, in addition to Psychoticism (Eysenck &

Eysenck, 1991). Personality reflects a broad and integrative feature of an individual's interpersonal style. For this reason, it is to be expected that more narrow factors that regulate our interpersonal interactions with others will influence personality traits.

Empathy, the ability to vicariously experience the affective state and to understand the situation of another person (Hoffman, 2007), should thus be predictive of personality traits.

Empathy has been suggested to play a role in the need for social interaction and therefore would be expected to be positively predictive of Extraversion scores (del Barrio, Aluja, & García, 2004). Neuroticism is defined as being moody, nervous, tense, and irritable (Eysenck & Barrett, 2013) and therefore would be expected to be positively related to empathy because feeling anxious oneself may facilitate the ability to feel another's emotional anxiety state (Eysenck & Eysenck, 1991). Psychoticism may be more appropriately described as impulsivity, aggressiveness, and tough mindedness and may be further subdivided into more specific traits (see Zuckerman, 2005). High empathy is likely to be associated with low scores on Psychoticism, which in part, is defined by low empathy and impersonal, unhelpful interactions with others (Eysenck & Barrett, 2013).

Empirical research has supported some of the predictions of an association between empathy and broad personality traits (Neumann, Boyle, & Chan, 2013). For example, empathy is significantly and positively correlated with extraversion (del Barrio et al., 2004) as well as with other personality trait measures that overlap with extraversion (e.g., 16PF Factor F; Guan, Jin, & Quian, 2012). However, there are also reports of empathy being unrelated to extraversion (Eysenck & Eysenck, 1980; Eysenck & McGurk, 1980). The association between empathy and neuroticism has been found to be small, both in the positive (Eysenck & Eysenck, 1980; Eysenck &

McGurk, 1980) and negative directions (Hekmat, Khajavi, & Mehryar, 1974).

Although slightly larger correlations have been found between empathy and psychoticism in one sample (Eysenck & Eysenck, 1980) these correlations were not present in a sample of delinquent offenders (Eysenck & McGurk, 1980).

The inconsistency in the reported associations between empathy and major personality trait dimensions observed in past research may reflect the differing characteristics of the samples studied. In particular, an important factor may be whether the studies used Western (e.g., Eysenck & McGurk, 1980) versus Asian (e.g., Guan et al., 2012) samples. Western and Asian populations are thought to differ along the individualism-collectivism continuum, with Asian cultures displaying greater collectivist values. Collectivism has been shown to be positively associated with empathy (Duan, Wei, & Wang, 2008). Furthermore, in a study using European American and Chinese American participants, it was shown that emotion-related responses, which are implicated in empathic responding, were influenced by cultural values (Tsai, Levenson, & McCoy, 2006).

Further research is thus required with an Asian population to determine the generality of the relationships between empathy and personality to a collectivist culture. In the only study conducted to date, Guan et al. (2012) examined the relationship between scores on a Chinese translated Empathy Quotient (EQ) and a Chinese translated Sixteen Personality Factor Questionnaire (16PF). Total EQ scores showed a positive correlation with the 16PF factors of E (humble-assertive), F (sober-happy-go-lucky), and Q3 (undisciplined-self-controlled) and a negative association with the 16PF factor of O (self-assured-insecure). It is noteworthy that the EQ provides a unidimensional measure of empathy.

Another relevant factor regarding the strength and reliability of the association

between personality and empathy relates to the underlying model of empathy used. The majority of past research (e.g., Guan et al., 2012) has treated empathy as a unidimensional construct. However, personality trait dimensions may be related to cognitive and affective empathy in different ways. For example, while narcissistic personality disorder is defined by a lack of empathy, it appears predominantly to reflect a deficit in the emotional components of empathy, whereas cognitive components of empathy are normal (Rittner et al., 2010). In the context of low affective empathy and high cognitive empathy, the likelihood of narcissistic manipulation and/or exploitation may be increased (Wai & Tiliopoulos, 2012). Future research on the relationship between personality and empathy would benefit from examining the relationships between personality traits and the different dimensions of empathy.

Four dimensions of empathy are proposed in the model developed by Davis (1983, 1996) and measured by the widely used and translated *Interpersonal Reactivity Index* (IRI; Davis, 1983). The IRI dimensions are labelled: Perspective Taking, Empathic Concern, Personal Distress, and Fantasy. *Perspective Taking* indicates the extent to which an individual can adopt the psychological point of view of another. *Empathic Concern* reflects the capacity for an individual to feel sympathy and be concerned for others, whereas personal distress reflects the capacity to experience negative emotions when exposed to the suffering of others. *Personal Distress* concerns the negative emotionality aspects of empathy which are positively correlated with measures of negative affect dimensions such as depression, anxiety, and stress (O'Connor, Berry, Weiss, & Gilbert, 2002). *Fantasy* measures the ability of an individual to identify with or imagine experiencing the events of fictitious characters. Perspective Taking is regarded as being most strongly associated with the *cognitive*

component of empathy, whereas Empathic Concern is regarded as most strongly reflecting the *affective component* of empathy (Davis, 1983, 1996).

Davis (1983) reported that Perspective Taking correlated positively with Extraversion scores while Personal Distress correlated negatively with Extraversion. In a study that used the EPQ-R, Richendoller and Weaver (1994) examined the relationship between personality dimensions and a range of empathy items, some of which were drawn from the IRI. Three of the four Empathic Concern subscale items correlated negatively with Psychoticism. One of the two Personal Distress subscale items correlated negatively with Extraversion and positively with Neuroticism scores. Finally, one of the four Perspective Taking items correlated negatively with Neuroticism scores. Although this study used both the IRI and EPQ-R, it was limited by examining the relationship between each individual empathy item as predictors of each of the three major EPQ-R personality constructs. Subscale scores of the IRI were not examined. Yeh and Bedford (2003) measured empathy using items from the IRI Perspective Taking and Empathic Concern subscales and measured personality empathy using the NEO-FFI in high school students in Taiwan. However, the relationships between these measures were not reported.

The present study aimed to investigate the relationship between the dimensions of empathy as measured by the IRI and personality as measured by the EPQ-R in a mainland Chinese population. The relationship between the IRI and major affect dimensions as measured by the 21 item Depression Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) was also examined. Affective components of empathy would be expected to correlate positively with affect measures (Omdahl & O'Donnell, 2001; Schreiter, Pijnenborg, & aan het Rot, 2013). We carried out multiple regression analyses to examine the strength of demographic variables (Sex

and Age), and the IRI empathy components as predictors of personality dimensions (EPQ-R - Extraversion, Neuroticism, Psychoticism, and Lie scale) and negative affect (DASS-21 – Depression, Anxiety, and Stress). On the basis of prior research (Davis, 1983; Richendoller & Weaver, 1994) and the observed relationship between perspective taking skills and social behaviours (e.g., interaction with others and outspokenness; Grizenko et al., 2000), the following hypotheses were investigated.

H1. The cognitive component of empathy (perspective taking) will significantly (positively) predict Extraversion scores (Davis, 1983). With regards to the affective component of empathy, it is hypothesised that personal distress will significantly (negatively) predict Extraversion scores (Davis, 1983; Richendoller & Weaver, 1994).

H2. The affective components of empathy (empathic concern, and personal distress) will significantly (positively) predict Neuroticism scores (emotionality may facilitate the perception of another's feelings; Eysenck & Eysenck, 1991).

H3. The affective components of empathy (empathic concern, and personal distress) will significantly (negatively) predict Psychoticism scores.

Materials and Methods

Participants and Procedure

Participants were 257 undergraduate students (102 males, 155 females) with a mean age of 19.35 years ($SD = 1.78$) recruited from six major universities located throughout mainland China (i.e., North China Electric Power University; Renmin University; Southwest University, Chongqing; China University of Political Law and Science; Peking University; and China Agricultural University). The participants completed the three questionnaires (see below) in a group setting and were debriefed at the conclusion. The students' scores generally fell within the normal range of DASS-21 symptomatology for Depression ($M = 2.18$, $SD = 2.61$), Anxiety ($M = 4.20$,

$SD = 3.14$), and Stress ($M = 4.24$, $SD = 3.13$). Likewise, their scores on the EPQ-R measures were as follows: Extraversion ($M = 12.57$, $SD = 4.69$), Neuroticism ($M = 10.82$, $SD = 5.25$), Psychoticism ($M = 4.51$, $SD = 2.53$), and Lie scale ($M = 10.82$, $SD = 3.30$), showing elevated scores only on the Lie scale.

Measures

A 22-item Chinese adaptation of the *Interpersonal Reactivity Index* (IRI; Davis, 1983) reported by Chan (1986) was used to collect self-report ratings on four separate empathy components (see Sui & Shek, 2005 for an alternative version). Responses were scored on a 5-point Likert-type scale ranging from “1 = *Does not describe me well*” to “5 = *Describes me very well*”. The IRI Chinese version retains Davis’ (1983) original four factor structure but has 5 to 6 items for each subscale rather than 7 items in the original version. The *Perspective Taking* subscale contains items that assess efforts to adopt the perspective of other people and see things from their point of view. The *Personal Distress* subscale measures personal feelings of anxiety and discomfort that result from observing another’s negative experience. The *Empathic Concern* subscale measures respondents’ feelings of warmth, compassion, and concern for others. The *Fantasy* subscale measures the tendency to identify with characters in movies, novels, and other fictional situations. The Chinese version has been reported to exhibit adequate reliability and validity (Wang, Neumann et al., 2013). In the present study, Cronbach alpha values were as follows: Total scale ($\alpha = .73$), Perspective Taking ($\alpha = .68$), Personal Distress ($\alpha = .74$), Empathetic Concern ($\alpha = .65$), and Fantasy ($\alpha = .64$). These values fall within a range whereby each new item adds new information for the particular construct but also has sufficient item homogeneity (Boyle, 1991; Kline, 1986).

A Chinese adaptation of the *Eysenck Personality Questionnaire Revised*

(EPQ-R; Eysenck & Eysenck, 1991) was used to assess participants' personality as measured by the Extraversion, Neuroticism, and Psychoticism scores (using a forced-choice "Yes/No" response scale). Also, the Lie scale may partially measure the tendency towards "faking good" or social acquiescence (Jackson & Francis, 1999). The construct of extraversion is based on cortical arousal principles, with extraverted individuals having lower arousal levels than introverted individuals and therefore, seeking out external stimulation to elevate physiological arousal. Personality traits associated with extraversion include sociability, dominance, and sensation seeking. Neuroticism reflects reactivity of the autonomic nervous system with those high in neuroticism displaying higher reactivity and therefore, less emotional stability. Personality traits associated with neuroticism include being highly anxious, moody, and tense. Psychoticism is associated with how one grasps reality. Personality traits associated with psychoticism include non-conformity, inconsideration, recklessness, impulsivity, and hostility. Cronbach alpha coefficients in the present study were calculated for the subscales of extraversion (.87), neuroticism (.85), psychoticism (.61) and lie scale (.58). The lower alpha value for psychoticism is similar to that reported in other studies with Chinese populations (e.g., Wang, He et al., 2013). The lie scale was of minimal theoretical importance in the present study.

A Chinese adaptation of the 21-item short-form of the Depression Anxiety, and Stress Scale (DASS-21; Taouk, Lovibond, & Laube, 2001) was used to collect self-report ratings on depression, anxiety, and stress. Each item was answered on a 4-point forced-choice response scale ranging from "0 = *Did not apply to me at all*", to "3 = *Applied to me very much, or most of the time*". Participants were asked to rate the extent to which they had experienced each symptom "*over the past week*". In this study, the Cronbach alpha coefficients were as follows: total scale (.84), depression

(.71), anxiety (.65), and stress (.70). Although indicating sufficient homogeneity, these are slightly lower than that reported previously (e.g., depression of .94, anxiety of .87, and stress of .91 by Antony, Bieling, Cox, Enns, & Swinson, 1998; also see Mahmoud, Hall, & Staten, 2010).

Results

Sex differences in empathy and personality traits were examined using a MANOVA procedure that examined both the overall multivariate effect, as well as the separate univariate effects. The overall multivariate effect was found to be significant (*Multivariate* $F_{12,228} = 2884.56, p < .0001$), thereby justifying interpretation of the univariate effects for each of the IRI, EPQ-R, and DASS-21 subscales without the need for a Bonferroni correction (cf. Huberty & Morris, 1989). Also, multiple regression analyses were carried out in order to examine the variance in the EPQ-R and DASS-21 subscales that was accounted for by the respective IRI empathy components. The finding of low EPQ-R Lie scale correlations with the three personality subscales suggests that the data was relatively accurate and free of bias.

Sex Differences in Empathy and Personality

Sex differences were examined across each of the IRI, EPQ-R, and DASS-21 subscales. As shown in Table 1, females scored significantly higher than males on all the IRI subscales except for Perspective Taking ($p < .06$). Females also scored significantly higher than males on Neuroticism ($p < .001$), and lower on Psychoticism ($p < .04$) but not on extraversion. However, no significant sex differences on the DASS-21 subscales were observed.

Insert Table 1 about here

Correlations between Empathy and Personality

Intercorrelations between the IRI, EPQ-R, and DASS-21 subscale scores are shown in Table 2. With respect to the IRI subscales, the largest significant correlation ($p < .001$) was between Personal Distress and Neuroticism scores ($r = .55$). Personal Distress scores also correlated significantly ($p < .001$) with Stress ($r = .41$), Anxiety ($r = .38$), and Depression ($r = .28$) scores, respectively. In addition, several other significant intercorrelations between the respective subscales were observed. For example, Neuroticism scores correlated strongly with Depression ($r = .49$), Anxiety ($r = .55$), and Stress scores ($r = .57$), respectively.

Insert Table 2 about here

Empathy Predictors of Personality

Multiple regression analyses were conducted using sex, age, and each of the IRI subscales as the independent variables, and the EPQ-R subscales as the dependent variables. Sex and age were entered in at Step 1 due to the observed relationship between sex and empathy (see Table 1) and the IRI subscales of Personal distress, Empathic concern, Perspective taking, and Fantasy were entered in at Step 2. The standardized regression coefficients, R Square (R^2), change in R Square (ΔR^2), F-values (F), and change in F (ΔF) are reported in Table 3.

Insert Table 3 about here

In Step 1 of the multiple regression analyses, sex alone predicted significant variance for neuroticism only ($\beta = .25$). In Step 2, the IRI empathy subscales accounted for significant additional variance in the EPQ-R subscales. For

Extraversion, both the affective components of Empathic concern and Personal distress accounted for a significant amount of the variance. In total, 31.3% of the variability in Extraversion was accounted for in Step 2, $R^2 = .31$, $F(6, 237) = 4.29$, $p < .001$. For Neuroticism, only Personal distress acted as a significant predictor, although 59.0% of variability in total was accounted for in Step 2, $R^2 = .59$, $F(6, 237) = 21.13$, $p < .001$. Personal distress resulted in the largest regression coefficient of all analyses ($\beta = .50$), supporting the findings from the bivariate correlation analyses. For Psychoticism, Perspective taking and Empathic concern both emerged as significant predictors, with 33.3% of variability explained in Step 2, $R^2 = .33$, $F(6, 237) = 4.91$, $p < .001$. Of the two predictors, Empathic concern accounted for the largest amount of unique variance ($\beta = -.22$).

Insert Table 4 about here

Empathy Predictors of Affective States

Similar to the analyses for empathy predictors of personality, multiple regression analyses were conducted using sex, age, and each of the IRI subscales as the independent variables, and the DASS-21 subscales as the dependent variables. The standardized regression coefficients, R Square (R^2), change in R Square (ΔR^2), F-values (F), and change in F (ΔF) are reported in Table 4. In Step 1, only Age was a significant negative predictor of Anxiety ($\beta = -.26$). After accounting for sex and age, Perspective taking made a significant negative prediction for Depression ($\beta = -.15$). However, Personal distress made the largest unique prediction not only for Depression ($\beta = .26$), but also for Anxiety ($\beta = .34$) and Stress ($\beta = .39$). The empathy components of Empathic concern and Fantasy made no significant unique prediction

of Depression, Anxiety, or Stress. Overall, the model in Step 2 accounted for 12% of the variability in Depression, $R^2 = .12$, $F(6, 237) = 5.75$, $p < .001$, 23% of the variability in Anxiety, $R^2 = .23$, $F(6, 237) = 12.27$, $p < .001$, and 19% of the variability in Stress, $R^2 = .19$, $F(6, 237) = 9.69$, $p < .001$.

Discussion

The results of the present study provided partial support for the hypotheses. In relation to the EPQ-R subscales, Empathic Concern and Personal Distress significantly predicted Extraversion ($\beta = .14$ and $-.21$, respectively), Sex and Personal Distress significantly predicted Neuroticism ($\beta = .15$ and $.49$, respectively), Perspective Taking and Empathic Concern significantly (both inversely) predicted Psychoticism ($\beta = -.13$ and $-.24$, respectively), while Empathic Concern and Personal Distress significantly predicted Lie Scale scores ($\beta = .21$ and $-.22$, respectively). Thus, although Empathic Concern was a significant predictor of Extraversion, Psychoticism (negatively), and Lie Scale scores, it was not a significant predictor of Neuroticism scores.

Exploratory analyses were also conducted to examine the relationships with the DASS-21 subscales. Perspective Taking and Personal Distress significantly predicted Depression ($\beta = -.15$ and $.26$, respectively), Age, Personal Distress, and Fantasy significantly predicted Anxiety ($\beta = -.26$, $.34$, and $.13$, respectively), while Personal Distress significantly predicted Stress ($\beta = .39$). It is noteworthy that Empathic Concern did not significantly predict Depression, Anxiety, or Stress scores despite it emerging as a significant predictor of extraversion and psychoticism personality traits.

Some studies have measured empathy and personality traits, but do not report the association between the variables (e.g., Claxon-Oldfield & Banzen, 2010;

Douglas, Bore, & Munro, 2012). Other studies have reported the relationships but have used a unidimensional measure of empathy (e.g., del Barrio et al., 2004; Eysenck & Eysenck, 1980; Eysenck & McGurk, 1980; Guan et al., 2012; Hekmat et al., 1974). Few previous studies have employed a multidimensional measure of empathy (Davis, 1983, 1996; Richendoller & Weaver, 1994). The present study revealed several meaningful associations between empathy and the various personality and affect dimensions, highlighting the importance of considering empathy as a multidimensional construct.

Perspective taking is regarded as reflecting the cognitive component of empathy (David, 1983). It has been observed that individuals who are easily able to transpose themselves into the thinking and acting of another person tend to be more social and outgoing/extraverted (Richendoller & Weaver, 1994). The social nature of the more extraverted individual (Eysenck & Barrett, 2013) is likely to result in higher levels of empathy due to the importance of empathy in social interactions. In addition, individuals high in extraversion are likely to have better social skills than those low in extraversion (e.g., Li, Tian, Fang, Xu, & Liu, 2010; Lieberman & Rosenthal, 2001). For example, nonverbal social cues are interpreted better by extraverted than by introverted individuals (Lieberman & Rosenthal, 2001). Consistent with these notions and consistent with the results reported by David (1983), a significant bivariate correlation emerged between Perspective taking and Extraversion. However, the unique prediction of Extraversion by Perspective Taking did not reach statistical significance in the multiple regression analyses. This may reflect the different cultural background of the present sample. However, we note that the association was in the correct direction (positive) and approached statistical significance ($p = .10$).

Empathic concern and Personal distress emerged as significant positive and

negative predictors of Extraversion, respectively. These findings are consistent with the notion that the socially skilled extraverted individual is better able to show concern and offer sympathy to others (Richendoller & Weaver, 1994). Early research also indicated that extraverted individuals tend to be warm and emotional people who have a strong interest in others. Such factors are consistent with the positive relationship between Empathic concern and Extraversion. The negative association between Personal distress and Extraversion, which was also found in a bivariate correlation analysis by Mičák and Zášková (2008), may reflect that the heightened emotional vulnerability associated with Personal distress (Davis, 1983) is present in introverted individuals.

Personal distress emerged as the only unique predictor of Neuroticism. Neuroticism is characterised by emotional instability in which the individual is moody, irritable, nervous, and apprehensive (Eysenck & Barrett, 2013). Such characteristics may result in an individual being more easily influenced by the other's emotional state. The positive association between Personal distress and Neuroticism is thus consistent with the notion that individuals high in neuroticism may be easily influenced to feel distress when exposed to a person in an unpleasant situation.

Perspective taking emerged as a significant unique predictor (negative) of Psychoticism. A significant unique prediction (negative) of Psychoticism was also made by Empathic concern. The definition of psychoticism, which incorporates the characteristic of lacking in empathy (Eysenck & Barrett, 2013) is consistent with the observed negative associations with empathy. Moreover, the characteristics of being unemotional, lacking in human feeling, cold, and impersonal (Eysenck & Barrett, 2013) further reinforce the finding of an association with the affective dimension of empathy as measured by Empathic concern.

The present study examined the relationship between empathy and personality within a mainland Chinese population. Guan et al. (2012) administered the Empathy Quotient (EQ) and 16PF to registered nurses and nursing students in Beijing, China. However, the EQ provides only a unidimensional measurement of empathy. The results of the present study suggest that important insights can be gained by examining the various empathy components. For example, the present results suggest that affective components of empathy (empathic concern, personal distress) are related to all broad personality dimensions, particularly extraversion, whereas cognitive components of empathy (perspective taking) is related only to psychoticism in a Chinese sample.

The present study also indicated both similarities and differences between Chinese and Western populations in the relationships between the subscales of the IRI and personality dimensions. The hypotheses we developed in the present study were largely based on Western samples (e.g., Davis, 1983; Eysenck & Eysenck, 1991; Richendoller & Weaver, 1994) and these were partially confirmed. The fact that the present findings were not wholly consistent with prior research with Western samples suggests that cultural values have selective effects on the relationship between empathy and stable personality traits. It is known that cultural values have an independent relationship with empathy (Duan, Wei, & Wang, 2008) and the cultural value of individualism-collectivism is the most prominent difference between Chinese and Western cultures. Moreover, the Confucius “Golden Mean” philosophy is influential in the Chinese culture, where it serves to reduce emotional expressiveness of people and thus potentially influence empathy-related processes.

The most noticeable cross-cultural inconsistency was with Perspective Taking. The predicted association between Perspective Taking and Extraversion based on

Western samples (Davis, 1983; Richendoller & Weaver, 1994) was not found. However, an unexpected association between Perspective Taking and Psychoticism was found. It has been argued that the differentiation between affective and cognitive empathy is reduced in Chinese populations (Siu & Shek, 2005). A meta-analysis of brain imaging studies of social processes (Han & Ma, 2014) suggested that people from Asian cultures have enhanced neural activity in brain areas involved in inferring the mental state of others and in emotion regulation. In contrast, people from Western cultures have increased neural activity in regions related to emotional responses and self-focussed information. The greater involvement of cognitive processing to understand others' emotions in Asian people may explain the unexpected association (negative) between Perspective Taking and Psychoticism, particularly as the latter has been partly defined as showing impersonal and unhelpful interactions with others (Eysenck & Barrett, 2013). In addition, the tendency for Asian people to control emotional expression (Ho, Fu, & Ng, 2004) and use perspective taking to understand others' emotions (Ho et al., 2004; Siu & Shek, 2005) may have reduced the association between Perspective Taking and Extraversion, given that those high in Extraversion show a strong social orientation.

Although the present study has advanced our understanding in several ways, it did have limitations. The present investigation employed the IRI because it is a well-established multidimensional measure and Chinese translated versions exist. However, the Cronbach alpha coefficients of three IRI scales was lower than .70 in the present study. Previous research has also suggested that IRI subscales, particularly Empathic Concern, have low alpha coefficients. Zhang, Dong, Wang, Zhan, and Xie (2010) used the Chan (1986) Chinese translated version as used the present study and reported a Cronbach's alpha of only .52 for the Empathic Concern subscale. Chiang,

Hua, Tam, Chao, and Shiah (2014) developed their own traditional Chinese translated version of the IRI. Their exploratory factor analysis indicated a four factor solution. A factor related to Empathic Concern was composed of six items, but only three were from the original Empathic Concern subscale. Moreover, Cronbach's alpha varied from .65 to .71 in two samples of healthy participants. Based on internal consistency concerns over the Empathic Concern subscale, future research could use Chinese translated versions of other empathy measures. However, if other questionnaires are used we recommend that they use a multidimensional measurement of empathy. The present results showed that different relationships between personality dimensions exist for cognitive versus affective empathy.

Another limitation of the present study is that the sample was recruited from university populations. Future research would allow for greater generalisation by using a sample recruited from the general population in China. In addition, although cultural differences may be an important factor in the relationship between empathy and personality traits, these were not specifically tested in the present study. Future research could use samples recruited from different ethnic groups to examine this question. Finally, the measurements of empathy, personality, and affect were all based on self-report. The use of more objective measures might reduce the potential for subjective bias or lack of insight that may reduce the validity of self-report measurements.

Conclusions

In conclusion, the present study has confirmed the relationship between empathy and the personality traits of extraversion, neuroticism, and psychoticism. The present findings extend previous research into personality traits and empathy to a mainland Chinese population, since an ethnic-related difference in empathy may exist

between Western and Eastern cultures, depending on the context of the empathy eliciting situation (Neumann et al., 2013, 2015). Further research into empathy and its correlates would benefit from using other ethnic groups. The present study also highlights the importance of recognising the multidimensional nature of empathy when examining its interrelationships with personality dimensions in different cultures.

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References

- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181.
- Batson, D. C. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickles (Eds.), *The social neuroscience of empathy* (pp. 3-15). Cambridge, MA: MIT Press.
- Besel, L. D. S., & Yuille, J. C. (2010). Individual differences in empathy: The role of facial recognition. *Personality and Individual Differences, 49*, 107-112.
- Boyle, G. J. (1991). Does item homogeneity indicate internal consistency or item redundancy in psychometric scales? *Personality and Individual Differences, 12*, 291-294.
- Boyle, G. J. (2008). Critique of the five-factor model of personality. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment: Vol. 1: Personality theories and models*. Los Angeles, CA: SAGE.
- Carlozzi, A. F., Bull, K. S., Eells, G. T., & Hurlburt, J. D. (1995). Empathy as related to creativity, dogmatism, and expressiveness. *Journal of Psychology, 129*, 365-373.
- Cattell, R. B. (1995). The fallacy of five factors in the personality sphere. *The Psychologist, May*, 207-208.
- Chan, C. (1986). *The relations between age, sex-role, orientation of humans and empathy*. Taipei: Department of Education, National Chengchi University.

Chiang, S. K., Hua, M. S., Tam, W. C. C., Chao, J. K., & Shiah, Y. J. (2014).

Developing an alternative Chinese version of the interpersonal reactivity index for normal population and patients with schizophrenia in Taiwan. *Brain Impairment, 15*, 120-131.

Claxton-Oldfield, S., & Banzen, Y. (2010). Personality characteristics of hospice palliative care volunteers: The “Big Five” and empathy. *American Journal of Hospice & Palliative Medicine, 27*, 407-412.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113-126.

Davis, M. H. (1996). *Empathy: A social psychological approach*. Boulder, CO: Westview Press.

del Barrio, V., Aluja, A., & García, L. F. (2004). Relationship between empathy and the big five personality traits in a sample of Spanish adolescents. *Social Behavior and Personality, 32*, 677-681.

Douglas, H., Bore, M., & Munro, D. (2012). Distinguishing the dark triad: Evidence from the five-factor model and the Hogan development survey. *Psychology, 3*, 237-242.

Duan, C., Wei, M., & Wang, L. (2008). The role of individualism–collectivism in empathy: An exploratory study. *Asian Journal of Counselling, 15*, 57-81.

Ekman, P. (2003). *Emotions revealed: Recognizing faces and feelings to improve communication and emotional life*. New York: Times Books.

Eysenck, S., & Barrett, P. (2013). Re-introduction to cross-cultural studies of the EPQ. *Personality and Individual Differences, 54*, 485-489.

- Eysenck, S. B. G., & Eysenck, H. J. (1980). Impulsiveness and venturesomeness in children. *Personality and Individual Differences, 1*, 73-78.
- Eysenck, H. J., & Eysenck S. (1991). *Manual of the Eysenck Personality Scales (EPS Adult)*. London: Hodder & Stoughton.
- Eysenck, S. B. G., & McGurk, B. J. (1980). Impulsiveness and venturesomeness in a detention center population. *Psychological Reports, 47*, 1299-1306.
- Grizenko, N., Zappitelli, M., Langevin, J.-P., Hrychko, S., El-Messidi, A., Kaminester, D., Pawliuk, N. and Ter Stepanian, M. (2000). Effectiveness of a Social Skills Training Program Using Self/Other Perspective-Taking: A Nine-Month Follow-Up. *American Journal of Orthopsychiatry, 70*, 501–509.
- Grynberg, D., Luminet, O., Corneille, O., Grèzesb, J., & Berthoz, S. (2010). Alexithymia in the interpersonal domain: A general deficit of empathy? *Personality and Individual Differences, 49*, 845-850.
- Guan, R., Jin, L., & Qian, M. (2012). Validation of the empathy quotient – short form among Chinese healthcare professionals. *Social Behavior and Personality, 40*, 75-84.
- Han, S., & Ma, Y. (2014). Cultural differences in human brain activity: A quantitative meta-analysis. *Neuroimage, 99*, 293-300.
- Hekmat, H., Khajavi, F., & Mehryar, A. (1974). Psychoticism, neuroticism, and extraversion: The personality determinants of empathy. *Journal of Clinical Psychology, 30*, 559-561.
- Ho, D. Y. F., Fu, W., & Ng, S. (2004). Guilt, shame and embarrassment: Revelations of face and self. *Culture & Psychology, 10*, 64-84.
- Hoffman, M. L. (1977). Sex differences in empathy and related behaviours. *Psychological Bulletin, 84*, 712-722.

- Hoffman, M. L. (2007). *Empathy and moral development: Implications for caring and justice*. Cambridge University Press: New York.
- Huberty, C. J., & Morris, J. D. (1989). Multivariate analysis versus multiple univariate analyses. *Psychological Bulletin*, *105*, 302-308.
- Jackson, C. J., & Francis, L. J. (1999). Interpreting the correlation between neuroticism and lie scale scores. *Personality and Individual Differences*, *26*, 59-63.
- Kline, P. (1986). *A handbook of test construction: Introduction to psychometric design*. Methuen: New York.
- Konrath, S. H., O'Brien, E. H., & Hsing, C. (2011). Changes in dispositional empathy in American college students over time: A meta-analysis. *Personality and Social Psychology Review*, *15*, 180-198.
- Li, J., Tian, M., Fang, H., Xu, M., Li, H., & Liu, J. (2010). Extraversion predicts individual differences in face recognition. *Communicative & Integrative Biology*, *3*, 295-298.
- Lieberman, M. D., & Rosenthal, R. (2001). Why introverts can't always tell who likes them: multitasking and nonverbal decoding. *Journal of Personality and Social Psychology*, *80*, 294-310.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression, Anxiety and Stress Scales* (2nd ed.). Sydney: Psychology Foundation.
- Mahmoud, J. S. R., Hall, L. A., Staten, R. T. (2010). The psychometric properties of the 21-item Depression Anxiety and Stress Scale (DASS-21) among a sample of young adults. *Southern Online Journal of Nursing Research*, *10*. URL: http://www.resourcenter.net/images/snrs/files/sojnr_articles2/vol10num04art02.html (Retrieved 16 September, 2014).

- Mlčák, Z., & Zášková, H. (2008). Analysis of relationships between prosocial tendencies, empathy, and the five-factor personality model in students of helping professions. *Studia Psychologica*, 50, 201-216.
- Neumann, D. L., Boyle, G. J., & Chan, R. C. K. (2013). Empathy towards individuals of the same and different ethnicity when depicted in negative and positive contexts. *Personality and Individual Differences*, 55, 8-13.
- Neumann, D. L., Chan, R. C. K., Boyle, G. J., Wang, Y., Westbury, H. R. (2015). Measures of empathy: Self-report, behavioral, and neuroscientific approaches. In G.J. Boyle, D.H. Saklofske, & G. Matthews (Eds.), *Measures of personality and social psychological constructs* (pp. 257-289), Amsterdam, The Netherlands: Elsevier/Academic.
- O'Connor, L. E., Berry, J. W., Weiss, J., & Gilbert, P. (2002). Guilt, fear, submission, and empathy in depression. *Journal of Affective Disorders*, 71, 19-27.
- Omdahl, B. L., & O'Donnell, C. (2001). Emotional contagion, empathic concern and communicative responsiveness as variables affecting nurses' stress and occupational commitment. *Journal of Advanced Nursing*, 29, 1351-1359.
- Reniers, R. L., Corcoran, R., Drake, R., Shryane, N. M., & Vollm, B. A. (2011). The QCAE: A Questionnaire of Cognitive and Affective Empathy. *Journal of Personality Assessment*, 93, 84-95.
- Richendoller, N. R., & Weaver III, J. B. (1994). Exploring the links between personality and empathic response style. *Personality and Individual Differences*, 3, 303-311.
- Ritter, K., Dziobek, I., Preißler, S., Rüter, A., Vater, A., Fydrich, T., Lammers, C-H., Heekeren, H. R., & Roepke, S. (2010). Lack of empathy in patients with narcissistic personality disorder. *Psychiatric Research*, 187, 241-247.

- Schreiter, S., Pijnenborg, G. H. M., & aan het Rot, M. (2013). Empathy in adults with clinical or subclinical depressive symptoms. *Journal of Affective Disorders, 150*, 1-16.
- Sui, A. M. H., & Shek, D. T. L. (2005). Validation of the Interpersonal Reactivity Index in a Chinese Context. *Research on Social Work Practice, 15*, 118-126.
- Taouk, M., Lovibond, P. F., & Laube, R. (2001). *Psychometric properties of a Chinese version of the 21-item Depression Anxiety Stress Scales (DASS21)*. Report for New South Wales Transcultural Mental Health Centre, Cumberland Hospital, Sydney, NSW.
- Tsai, J. L., Levenson, R. W., & McCoy, K. (2006). Cultural and temperamental variation in emotional response. *Emotion, 6*, 484-497.
- Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. *Personality and Individual Differences, 52*, 794-799.
- Wang, S. H., He, G. P., Jiang, P. L., Tang, L. L., Feng, X. M., Zeng, C., & Wang, G. F. (2013). Relationship between cancer-related fatigue and personality in patients with breast cancer after chemotherapy. *Psycho-Oncology, 22*, 2386-2390.
- Wang, Y., Neumann, D. L., Shum, D. H. K., Liu, W., Shi, H., Yan, C., Lui, S. S., Zhang, Q., Li, Z., Cheung, E. F.C., & Chan, R. C. K. (2013). Cognitive empathy partially mediates the association between negative schizotypy traits and social functioning. *Psychiatry Research, 30*, 62-68.
- Zang, F. F., Dong, Y., Wang, K., Zhan, Z. Y., & Xie, L. F. (2010). Reliability and validity of the Chinese version of the interpersonal reactivity index-C. *Chinese Journal of Clinical Psychology, 18*, 155-157.

Zuckerman, M. (2005). *Psychobiology of personality* (2nd edn). New York:
Cambridge University Press.

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Table 1

Sex differences on subscale scores of the Interpersonal Reactivity Index (IRI), Eysenck Personality Questionnaire-Revised (EPQ-R), and Depression, Anxiety, and Stress Scales (DASS-21)

Dimension	Males	Females	$F_{1,240}$	$p <$	d
<u>Empathy (IRI)</u>					
Perspective Taking	3.49 (0.61)	3.64 (0.61)	3.68	.056	.15
Personal Distress	2.52 (0.64)	2.81 (0.71)	10.57	.001	.43
Empathic Concern	3.07 (0.59)	3.28 (0.55)	7.96	.005	.39
Fantasy	3.14 (.61)	3.40 (.63)	10.15	.002	.42
<u>Personality (EPQ-R)</u>					
Extraversion	12.15 (4.58)	13.01 (4.74)	1.97	.161	.18
Neuroticism	9.20 (4.72)	11.86 (5.44)	15.26	.001	.52
Psychoticism	4.87 (2.77)	4.18 (2.35)	4.29	.040	.16
Lie scale	10.42 (3.44)	11.08 (3.19)	2.32	.129	.20
<u>Negative Affect (DASS-21)</u>					
Depression	2.06 (2.49)	2.18 (2.69)	0.13	.724	.05
Anxiety	3.92 (2.76)	4.35 (3.35)	1.10	.295	.14
Stress	3.92 (2.86)	4.49 (3.31)	1.94	.165	.18

Note. (SDs shown in parentheses)

Table 2

Correlations between the subscales of the Interpersonal Reactivity Index, Eysenck Personality Questionnaire-Revised, and Depression, Anxiety and Stress Scales (N = 257)

Measure	PT	EC	PD	F	E	N	P	L	D	A	S
PT	-										
EC	.30	-									
PD	-.14	.17	-								
F	.10	.17	.25	-							
E	.21	.16	-.17	.06	-						
N	-.14	.07	.55	.22	-.29	-					
P	-.23	-.28	.04	-.10	-.13	.26	-				
L	.21	.21	-.19	-.03	.04	-.36	-.39	-			
D	-.21	.06	.28	.11	-.43	.49	.34	-.23	-		
A	-.08	.19	.38	.21	-.25	.55	.27	-.27	.61	-	
S	-.15	.42	.41	.14	-.21	.57	.27	-.29	.66	.69	-

Notes. $r > .13, p < .05$; $r > .16, p < .01$. PT=Perspective Taking; EC=Empathic Concern; PD=Personal Distress; F=Fantasy; E=Extraversion; N=Neuroticism; P=Psychoticism; L=Lie Scale; D=Depression; A=Anxiety; S=Stress

Table 3

Sex, Age, and Interpersonal Reactivity Index subscales as predictors of EPQ-R subscale scores (N=257)

	Extraversion		Neuroticism		Psychoticism		Lie Scale	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Sex	.08	.07	.25**	.15**	-.14*	-.09	.11	.11
Age	.03	.04	-.13*	-.11	-.06	-.08	.04	.04
Perspective taking		.12		-.09		-.13*		.11
Empathic concern		.14*		-.03		-.24**		.21**
Personal distress		-.21**		.49**		.09		-.22**
Fantasy		.07		.09		-.05		-.04
R^2	.01	.09	.07	.35	.02	.13	.01	.13
F	1.02	4.24**	10.12**	21.96**	3.13*	5.94**	1.65	6.00**
ΔR^2		.08		.27		.10		.11
ΔF		5.82**		25.90**		7.19**		8.08

Notes. Standardized regression (β) coefficients are reported. * $p < 0.5$, ** $p < .01$

Table 4

Sex, Age, and Interpersonal Reactivity Index subscales as predictors of DASS-21 subscale scores (N=257)

	Depression		Anxiety		Stress	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Sex	.01	-.02	.09	.00	.09	.02
Age	-.05	-.04	-.27**	-.26**	-.10	-.09
Perspective taking		-.15*		-.04		-.09
Empathic concern		-.11		-.03		-.05
Personal distress		.26**		.34**		.39**
Fantasy		.08		.13*		.06
R^2	.00	.12	.08	.23	.02	.19
F	0.26	5.75**	10.52**	12.27**	2.15	9.69**
ΔR^2		.12		.15		.17
ΔF		8.48**		12.22**		13.25**

Note. Standardized regression (β) coefficients are reported. * $p < 0.5$, ** $p < .01$