ORIGINAL ARTICLE

The Basic Empathy Scale: A Chinese Validation of a Measure of Empathy in Adolescents

Yaoguo Geng · Dan Xia · Beibei Qin

Abstract The purpose of this study was to evaluate the reliability and validity of the Chinese version of the Basic Empathy Scale (BES). The Chinese version of BES was administered to a sample ($n = 1,524$) aged 9–18 and 65 males with conduct disorder aged 13–18. The result of confirmatory factor analysis showed a two-factor structure with four items deleted to be the most adequate model (cognitive empathy, affective empathy). Empathy was positively correlated with a measure of prosocial behaviour and a measure of emotional problems. Boys with conduct disorder scored significantly lower than matched participants on cognitive empathy. Moreover, in line with previous researches, girls were found to score significantly higher on empathy than boys and the scores on both cognitive and affective empathy increased with age. The Chinese revision exhibited satisfactory internal consistency and moderate test–retest reliability.

Keywords Empathy · Validation · Chinese adolescents

Introduction

Empathy is a notoriously elusive psychological construct. This is because empathy is often very broadly defined [1] and as such is often not clearly separated from overlapping concepts that are related to, but separate from empathy. A very useful definition of empathy is that provided by Cohen and Strayer [2] who suggest that empathy is 'the understanding and sharing in another's emotional state or context'. This definition has a number of benefits. First it acknowledges the separation of the cognitive element of empathy (i.e., the ability to understand another's emotions) from the affective element of empathy (i.e., the sharing of another's emotional state). This is an important recent development in empathy research which has helped to clarify some counterintuitive findings noted when comparing empathy to certain behaviours [3–6]. Second, this definition helps to separate the psychological construct of empathy from the related processes

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that might result in an empathic response. For the purposes of measuring empathy and understanding its relationships it is useful to separate empathy from factors that facilitate empathy (e.g. emotional recognition ability) [7], and also the outcomes of empathy (e.g. sympathy) [8], which have been combined in other models of empathy [9]. Likely, as a result, measures of sympathy are much more open to social desirability bias than measures of empathy [10, 11].

Both psychological and cognitive neuroscience research demonstrated that empathy has distinct cognitive and affective components [12–16] which require measurement, and a number of devices have been developed for this purpose. These have included evaluating an individual's responses to videotapes, other visual stimuli or the reports of one's empathy by others. By far the most common approach to measuring empathy, however, is the self-reported questionnaire. A great many of these devices exist [4, 17, 18], but the Basic Empathy Scale (BES) currently appears to have some of the strongest theoretical and statistical support [5, 10, 11, 19].

The BES is a simple but effective tool for measuring the empathy of adolescents. The validation of the scale was conducted on a sample of 720 adolescents from England and the two components of empathy (cognitive and affective) were derived from an exploratory and subsequent confirmatory factor analysis [5]. This self-report scale has shown good validity [5, 11], and its psychometric properties appear to translate well to other Western cultures [10, 19]. However, Unlike Western cultures, China has a collectivist culture, along with corresponding culture-related behaviour pattern. For example, as an explicit coping style, somatization is widely adopted by Chinese people to reduce or avoid introspection and direct affective interaction [20], whereas Western get used to adopting psycholinguistic to express their emotional experience directly, namely 'psychologization' [21]. Also, it is necessary to give consideration to this difference in relation to the empathy, which is thought to be influenced by cultural factors [22]. Thus, verifying the validity of the BES is the primary work before its using in Chinese cultures.

Research using the BES (and other measures of empathy) has identified a number of consistent associations. The first of these is that females score higher than males [1, 11, 12] and this is especially the case with self-report measures of empathy. Furthermore, the difference between males and females appears greater for affective as opposed to cognitive empathy [11, 19]. It is not altogether clear why females score higher than males but this is often attributed to the fact that females are generally socialised to be more aware of, and respond to, the emotions of other more so than males. Alternatively, females may score higher than males because they have an increased ability to access and express their emotional repertoires [1].

Measures of empathy also appear to have relatively consistent associations with certain behaviours. For example, individuals who report acting in a prosocial manner tend to score higher on measures of cognitive and affective empathy. This makes theoretical and intuitive sense as those with a heightened ability to experience or comprehend another's negative emotions will be more likely to act to reduce these [8]. For example, Jolliffe and Farrington [5] found that male and female adolescents who reported intervening in a bullying incident had significantly higher cognitive and affective empathy than those who did not. Similarly, Albiero [19] identified significant positive correlations between scores on a measure of prosocial behaviour and both cognitive and affective empathy for males and females.

Although it is widely accepted that the relationship between empathy and antisocial behaviour is simply the converse of the empathy—prosocial behaviour relationship [13, 14, 23], some interesting derivations have been noted. For example, some research has noted that, in line with expectation, empathy is negatively related to aggression and disruptive

behaviour [24], children and adolescents with conduct disorders had significantly lower empathy than those in the control group [2, 25], while others have not found evidence that those who act antisocially have lower empathy [6]. The resolution of these apparent contradictory findings appears to be related to both the seriousness of the antisocial behaviour and whether cognitive or affective empathy was assessed. In fact, Bjorkqvist and Osterman [26] have suggested that certain types of antisocial behaviour such as skilful bullying or recruiting others to take part in antisocial behaviour might even be facilitated by these individuals' adequate or even elevated cognitive empathy. This separation of cognitive and affective empathy fits well with the current conceptualisation of bullies who uses their sufficient cognitive empathy to skilfully manipulate and deceive others, while having no affective constraints on their antisocial actions [27].

Only a small number of studies have examined how empathy levels might change through life. An early study indicated that empathy increased with age for the normal controls during adolescent period [28], whereas the cases did not. Recently, Dadds [12] measured both cognitive and affective empathy of a group of Australian children and adolescents aged 4–16. The results suggested that cognitive empathy, as judged by parents increased with age, but affective empathy did not.

Aims and Hypothesis

In China, three measuring instruments, include Interpersonal Reactivity Index (IRI) [4, 22], the Questionnaire Measure of Emotional Empathy (QMEE) [18, 29], and the Jefferson Scale of Empathy [30, 31] were revised or compiled for research work to investigate the empathy of adults. The IRI and the QMEE have enjoyed widespread use in research [19], but their limits also become evident. First, both IRI and QMEE are confounded with sympathy. Second, the IRI's underlying theoretical structure has not been confirmed completely. Third, the QMEE, which investigates the emotional element of empathy, do not capture the cognitive element.

Thus, as a concise and effective tool for measuring empathic responsiveness in adolescents, as a new scale which included cognitive element and affective element, the BES has not been validated in the context of Chinese cultures. With the written approval of Darrick Jolliffe, the authors are to address this gap in the literature by evaluating the reliability and validity of the BES in a large sample of Chinese children and adolescents.

The hypotheses guiding this study were as follows. First, authors predicted that the Chinese version of the BES would demonstrate a two-factor solution (i.e., cognitive empathy and affective empathy) as reported by Jolliffe and Farrington [5, 11]. Second, a positive association would be found between empathy and measures of prosocial behaviour. Third, patients with conduct disorder (CD) would be found to have lower levels of empathy than normal controls. Finally, girls would score significantly higher than boys on the empathy scores.

Method

Participants and Procedure

The participants were recruited from two primary schools, two junior middle schools and one senior middle school in Zhengzhou, China. Of the initial 1,929 students, 405 (21%) were excluded because of incomplete data. The final sample consisted of 1,524 Chinese

children and adolescents aged 9–18 years (M = 13.54, SD = 2.51) enrolled in fourth grade to twelfth grade, including 783 boys (51.4%; M = 13.51, SD = 2.47) and 741girls (48.6%; M = 13.58, SD = 2.55). There was no significant difference between the boys and girls in age (t = .60, p = .55). Among these participants, 31.2% were from primary schools (fourth grade to sixth grade), 35.2% were from junior middle schools (seventh grade to ninth grade) and 33.6% were from senior middle school (tenth grade to twelfth grade). Also, there was no significant difference in the demographics between the students who were included in the study and those who were excluded.

After appropriate permissions from the school boards and after participants' consents were obtained, the students completed the scales during regular class hours. Students were allowed to clarify the meaning of some questions, but their responses to the items were not influenced by the two skilled researchers. They were also assured that their answers were completely confidential. The investigation was carried out in accordance with the latest version of Declaration of Helsinki.

In addition, the data set was composed 65 consecutive male outpatients with conduct disorder diagnosis according to DSM-IV criteria. Diagnosis was performed or identified on department of psychiatry, 9th people's hospital of Zhengzhou through a non-structured interview and extensive psychiatric assessment conducted by two qualified psychiatrists from 2009 to 2010. The patients had no other major psychiatric co-morbidity with ages ranging from13 to 18 (M = 16.11, SD = 1.20).

This project was reviewed and approved by the ethics committee of the hospital. After thorough description of the project to the patients and after the assurance that their decision to take part in the study would not interfere with their access to treatment, all participants gave their informed consents and filled out the BES in the hospital.

To further test the scale's discriminant validity, according to the proportion of 1 (case): 3 (controls), a subsample of normal boys (n = 195) who ranged in age from 13 to 18 years old (M = 15.94, SD = 1.10) were selected randomly from the general participants to examine the latent differences between boys diagnosed as conduct disorder and comparable participants. Independent t tests showed that age did not differ between the two groups (t = −1.03, p = .31).

In order to examine the test–retest reliability of the BES, from the sample population, 101 junior middle school students 12–15 years old (61 boys, 40 girls; M = 13.7, SD = 1.13) were retested a period of 4 weeks after the initial screening.

Measures

Basic Empathy Scale (BES)

The original BES is a 20-item, self-rating measure with two factors: cognitive empathy (9 items; e.g., "I find it hard to know when my friends are frightened") and affective empathy (11 items; e.g., "I don't become sad when I see other people crying") [11]. Agreement with the statements was indicated on a 5-point Likert-type anchored by 1: Strongly disagree and 5: Strongly agree. The sum of the cognitive empathy items' ratings was the cognitive factor score (range 9–45), and the sum of the affective empathy items' ratings was the affective factor score (range 11–55); the sum of two factors scores was the total score (range 20–100).

The Chinese version of BES was done using the back-translation method. First the scale was translated into Chinese by a bilingual psychologist from the education department of Zhengzhou University. Subsequently, another bilingual psychologist translated the Chinese

version back into English. The original and the back-translated items were compared for non-equivalence of meaning, and discrepancies were revised. The process continued until no semantic differences were noticed between English version and Chinese version. Then the Chinese version was administered to a pilot sample of 12 students (9–16 years old) to assess the clarity of the items. Based on item by item assessment two-way discussion the Chinese version of BES was found to be understandable by students of this age group.

The Strengths and Difficulties Questionnaire (SDQ for Students)

SDQ is a 25-item, self-rating scale with five factors [32]: 5 items for hyperactivity (HS), 5 items for emotional symptoms (ESS), 5 items for conduct problems (CPS), 5 items for peer problems (PPS) and 5 items for prosocial behaviour (PBS). Each item has three possible responses, 0, 1 or 2. The score for each scale is generated by adding up the scores on the 5 items within that scale (range 0–10). The psychometric properties of the Chinese version of the SDQ have been described as satisfactory elsewhere [33]. In this study, the prosocial behaviour subscale was used to evaluate the correlation between empathy and prosocial behaviour, Cronbach's α was .83, and Cronbach's α was .85 for entire scale.

Results

Construct Validity of Chinese Version of Basic Empathy Scale

To examine the fit of the two-factor model obtained in a British sample [11], Confirmatory factor analysis (CFA) was performed with LISREL 8.51 using the Chinese sample ($n = 1,524$). In the current study, the model fit was evaluated with the following indicators: $X^2/df < 5$; NFI, NNFI, CFI, GFI and AGFI > .90; RMSEA < .08. The results of the CFA revealed the model obtained in a British sample [11] did not fit this Chinese sample well ($X^2 = 1,049.31$, df = 169, $X^2/df = 6.21$, RMSEA = .063, NFI = .79, NNFI = .79, CFI = .81, GFI = .93, AGFI = .91), indicating some adjustment was necessary.

To explore the factor structure of BES in this Chinese sample, about half the student's data ($n = 792$) were sampled randomly to be used in an exploratory factor analysis. A principal components analysis with varimax rotation was performed to explore the correlation matrix of the BES. Bartlett's test of sphericity indicated that the data was suitable for factor analysis (KMO = .82). The fit of the factor structure was evaluated using multiple criteria: Factors with eigenvalues >1.0 were chosen; Items were considered if they loaded above .30 on a factor and had the highest loading on a factor by .15 or more when compared across factor; more than three items must load on each retained factors.

A Scree plot suggested that only two factors be retained, accounting for 31.85% of the total variance, with item 3 (I can understand my friend's happiness when she/he does well at something) discarded. Factor 1 (accounting for 16.28% of the variance) comprised 11 items (1, 2, 4, 5, 7, 8, 11, 13, 15, 17, 18), was identical to original version and therefore was labeled affective empathy; Factor 2 (accounting for 15.57% of the variance) comprised 8 items (6, 9, 10, 12, 14, 16, 19, 20), was similar to original version and therefore was labeled cognitive empathy. This 19-item, two-factor model supported the original solution of BES [11] (Table 1).

The other part of the sample ($n = 732$) was used for confirmatory factor analysis to re-examine the fit of the model obtained using exploratory factor analysis in the Chinese sample. The results suggested that the 19-items, two factor model did not fit the data very

Table 1 Factor analyses of the Basic Empathy Scale in Chinese children and adolescents ($n = 792$)

| No	Item	Factor1	Factor2
5	I get caught up in other people's feelings easily	**.64**	.04
17	I often get swept up in my friend's feelings	**.63**	.01
8	Other people's feelings don't bother me at all	**.62**	.13
18	My friend's unhappiness doesn't make me feel anything	**.59**	.22
7	I don't become sad when I see other people crying	**.55**	.21
2	After being with a friend who is sad about something, I usually feel sad	**.52**	−.03
1	My friend's emotions don't affect me much	**.48**	.08
15	I tend to feel scared when I am with friends who are afraid	**.46**	−.13
13	Seeing a person who has been angered has no effect on my feelings	**.46**	.14
11	I often become sad when watching sad things on TV or in films	**.39**	.24
4	I get frightened when I watch characters in a good scary movie	**.33**	.07
10	I can usually work out when my friends are scared	.05	**.70**
19	I am not usually aware of my friend's feelings	.08	**.63**
9	When someone is feeling 'down' I can usually understand how they feel	.03	**.62**
20	I have trouble figuring out when my friends are happy	.07	**.60**
6	I find it hard to know when my friends are frightened	.04	**.57**
14	I can usually work out when people are cheerful	.06	**.55**
16	I can usually realise quickly when a friend is angry	.05	**.52**
12	I can often understand how people are feeling even before they tell me	.16	**.47**
3	I can understand my friend's happiness when she/he does well at something	.12	.28

well ($X^2 = 285.08$, d$f = 136$, X^2/d$f = 2.09$, RMSEA $= .045$, NFI $= .81$, NNFI $= .88$, CFI $= .89$, GFI $= .93$, AGFI $= .94$). According to modification indices [34], three more items (item 2: After being with a friend who is sad about something, I usually feel sad; item 4: I get frightened when I watch characters in a good scary movie; and item 15: I tend to feel scared when I am with friends who are afraid) were also deleted. Confirmatory factor analysis revealed that this revised 16-item, two-factor model was acceptable for Chinese sample ($X^2 = 186.03$, d$f = 89$, X^2/d$f = 2.09$, RMSEA $= .038$, NFI $= .91$, NNFI $= .93$, CFI $= .95$, GFI $= .97$, AGFI $= .95$) (Fig. 1).

Empathy-Prosocial Behaviour Correlations

Similar to Albiero [19], as depicted in Table 2, there were significant positive correlations between two of the factors of the BES and the prosocial behaviour subscale of the Strengths and Difficulties Questionnaire. Interestingly, the correlations between empathy and prosocial behaviour were unequal for boys and girls, while the correlations did not differ significantly ($p > .05$). Moreover, affective empathy was also found to be positively and significantly correlated with the emotional symptoms (ESS) scores for both genders.

Discriminant Validity

The results indicated that boys with conduct disorder reported significantly lower cognitive empathy ($t = 3.18$, $p < .01$, $d = .45$) than comparable boys (Table 3).
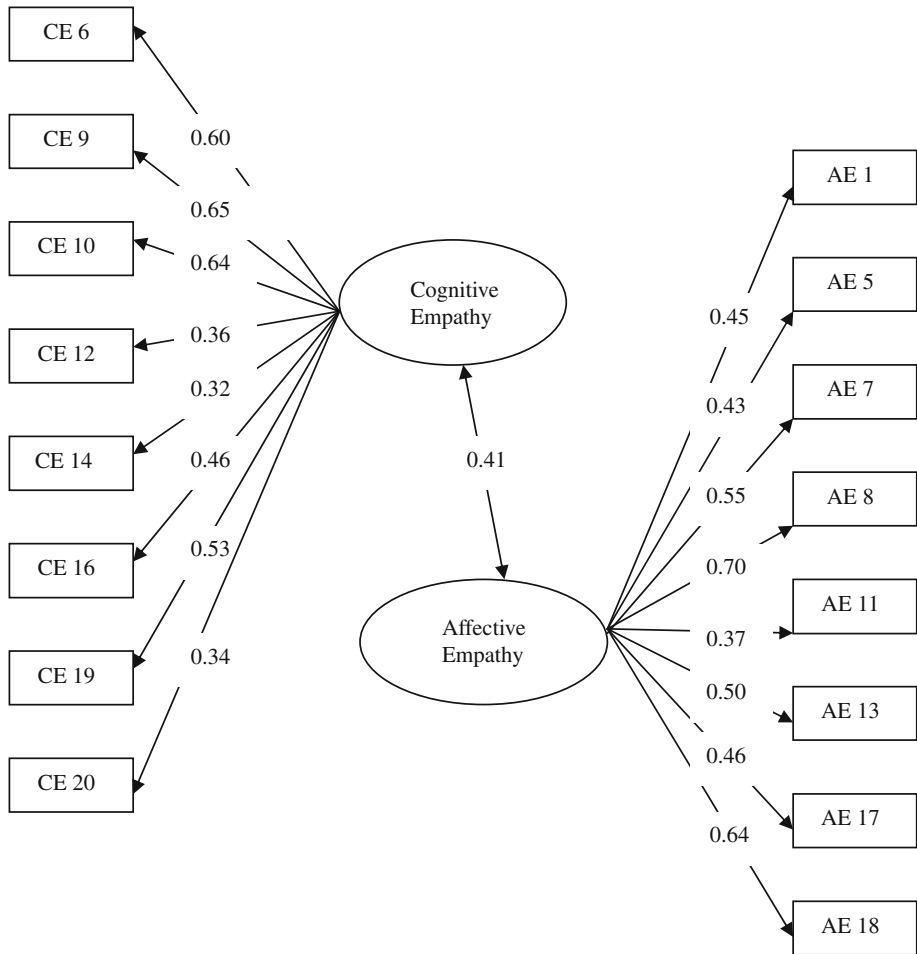
Fig. 1 Two-factor confirmatory analysis model of the BES (16 items)

Gender and Age Differences

Table 4 shows the means and standard deviations for the Chinese version of BES by the age and gender of the sample. The sample was divided into three age groups (9–12, 13–15, and 16–18) for ease of analysis.

As expected, there were main effects for gender evident on cognitive empathy (F [1, 1518] = 22.75, $p < .01$, $f = .12$), affective empathy (F [1, 1518] = 55.15, $p < .01$, $f = .19$), and total score of scale (F [1, 1518] = 58.87, $p < .01$, $f = .20$), with girls reporting higher levels of empathy on the two factors than boys, especially for affective empathy. But the effect sizes of gender differences in this sample were smaller than that of previous study [11].

As for age differences, in contrast to Dadds [12], the present study found that both cognitive empathy (F [2, 1518] = 3.70, $p < .05$, $f = .05$) and affective empathy (F [2, 1518] = 15.73, $p < .01$, $f = .10$) increased with age, while the effect sizes were quite small.

Table 2 Correlations between empathy and SDQ for boys and girls

	Total (n = 1,524)			Boys (n = 783)			Girls (n = 741)		
	BTS	CE	AE	BTS	CE	AE	BTS	CE	AE
HS	.01	−.03	.05	.04	.00	.06	.07	−.01	.11
ESS	.21*	.05	.30**	.28*	.14	.34**	.21	−.03	.34*
CPS	−.16	−.12	−.16	−.14	−.11	−.15	−.15	−.12	−.12
PPS	−.05	−.07	−.02	.06	−.02	.12	−.20	−.15	−.18
PBS	.47**	.45**	.38**	.47**	.49**	.37**	.41*	.34*	.34*

HS Hyperactivity, *ESS* emotional symptoms, *CPS* conduct problems, *PPS* peer problems, *PBS* prosocial behaviour, *BTS* total score of the Basic Empathy Scale, *CE* cognitive empathy, *AE* affective empathy

* $p < .05$; ** $p < .01$ (two-tailed test for all)

Table 3 Comparison of empathy between normal group and CD group

	CD group (n = 65)	Normal group (n = 195)	t	p
BTS	58.17 ± 7.65	60.94 ± 6.82	−2.18*	.03
CE	29.86 ± 4.72	32.09 ± 4.94	−3.18**	.00
AE	28.31 ± 4.74	28.43 ± 4.54	−.15	.88

BTS total score of the Basic Empathy Scale, *CE* cognitive empathy, *AE* affective empathy

* $p < .05$; ** $p < .01$ (two-tailed test for all)

Table 4 Means and SD for empathy split by age group and gender

Age (year)		Boys		Girls		Total	
		Mean	SD	Mean	SD	Mean	SD
9–12	BTS	57.79	9.57	61.52	8.89	59.65	9.42
	CE	31.70	5.45	33.16	5.00	32.39	5.29
	AE	26.26	6.12	28.35	5.80	27.25	6.05
13–15	BTS	59.94	8.29	63.40	7.31	61.63	8.01
	CE	32.45	4.85	33.87	4.24	33.14	4.61
	AE	27.49	5.46	29.53	5.23	28.49	5.44
16–18	BTS	59.30	8.69	62.64	7.84	61.76	7.36
	CE	32.24	4.31	32.82	3.81	32.53	4.07
	AE	28.12	5.31	30.32	4.65	29.22	5.10

BTS total score of Basic Empathy Scale, *CE* cognitive empathy, *AE* affective empathy

No interaction was found between gender and age on cognitive empathy (F [2, 1518] = 1.32, $p = .27$), affective empathy (F [2, 1518] = .03, $p = .97$), and total empathy (F [2, 1518] = .31, $p = .73$).

Correlation Between Cognitive Empathy and Affective Empathy

Pearson correlation coefficients between the cognitive and affective subscales were .32 ($p < .01$) for entire sample, .32 ($p < .01$) for boys and .28 ($p < .01$) for girls.

Test–retest Reliability

A subsample of 101 students were selected from the general participants and were re-tested 4 weeks later to evaluate the stability of the 16-item, two-factor scale. No significant differences were found between test scores and retest scores on cognitive empathy ($t = .02$, $p > .05$) and affective empathy ($t = .94$, $p > .05$), indicating that the scores themselves are stable. The test–retest correlations were .60 for cognitive empathy, .71 for affective empathy, .70 for total score of scale, respectively.

Internal Consistency Reliability

The Chinese version of BES and its subscales demonstrated sufficient internal consistency. Cronbach's alpha coefficients were .72 for cognitive empathy, .73 for affective empathy, and .77 for total score of scale, respectively.

Discussion

In the current study, researchers reported a variation in construct in Chinese version of BES. The results confirmed the two dimensional structure of the original version [11], with most items corresponding to the items included in the factors the original scale measured. In Jolliffe and Farrington's study [11], cognitive empathy consisted of 9 items, affective empathy consisted of 11 items. Similar to their model, the two factors identified in present study were also cognitive empathy (comprising 6, 9, 10, 12, 14, 16, 19, 20) and affective empathy (comprising 1, 5, 7, 8, 11, 13, 17, 18), with one item (item 3) of cognitive empathy and 3 items (items 2, 4, 15) of affective empathy discarded. The Chinese version of BES showed satisfactory goodness-of-fit ($X^2 = 186.03$, df $= 89$, $X^2/df = 2.09$, RMSEA $= .038$, NFI $= .91$, NNFI $= .93$, CFI $= .95$, GFI $= .97$, AGFI $= .95$).

The alteration of the scale may be accounted by cross-cultural diversity between British and Chinese people. In China, people take interpersonal relationships as their central resource. For the sake of interpersonal harmony, Chinese people usually adopt the way of act, 'poker face', to mask their real attitudes (especially for strong or negative emotions, such as sadness, fright and scare, mentioned above in items 2, 4 and 15) and keep peace. Sometimes, Chinese people trend to rely on covert and more complex methods of communication (e.g., vague comments) while Western trend to use direct and simple methods [35]. Therefore, the usage of body signals (e.g., headache) becomes an important manifestation mode of emotions in Chinese culture, so much so that the deficiencies in the expression or understanding of one's own emotions, namely alexithymia, are more common in Chinese people than Western [21]. For example, Su [35] reported that somatic symptom may differ in presentation from Chinese youths and Western, with somatic symptom representing physical symptoms of the underlying anxiety including generalized anxiety, social phobia and school phobia in Chinese children. Thus, it is possible that empathy statements are sensitive to cultural issues and may have different meaning among Chinese children and adolescents.

Concurring with previous studies [11, 12], this study mirrors the findings of positive connections between empathy and prosocial behaviour. These results supported the criterion-related validity of the Chinese version of BES.

The current study found boys with conduct disorders have lower cognitive empathy than matched boys, indicating the important role of cognitive empathy in regulating behaviours,

but not affective empathy. These findings are consistent with Jolliffe and Farrington that have reviewed these issues [14]. That is, cognitive empathy has a stronger negative relationship with antisocial behaviour than has affective empathy. However, these results were not in line with Lovett and Sheffield [23], who offered the findings that the aggressive adolescents reported significantly lower affective empathy, yet not in line with Bjorkqvist and Osterman [26], who revealed certain types of antisocial behaviour might even be facilitated by these individuals' adequate or even elevated cognitive empathy. The resolution of these apparent contradictory findings appears to be related to the tools that were used for empathy measuring, the seriousness of the antisocial behaviour, the diverse samples (community-based or clinic-referred), and the heterogeneity of conduct disorder. The block of conduct disorder comprises a range of dissocial, aggressive, or defiant behaviours due to biological and psycho-social influencing factors, and different behaviours may relate to different dimensions of empathy [6]. So the subtypes of conduct disorder would differ in empathy levels. Alternatively, some variables, such as intelligence, socio-economic status may affect the results.

Consistent with previous researches [1, 10, 11, 19, 36] and hypothesis four, gender differences were found in this study, which showed that girls were more empathic than boys, especially for affective empathy. Additionally, as depicted in Table 2, the correlations between empathy and prosocial behaviour were also different for boys and girls (although the correlations did not differ significantly), and specifically, the coefficients were higher for boys than girls. These findings suggested that empathy was a stronger predictor of prosocial behaviour among boys than among girls, and that gender might be a moderating variable on the relationship between empathy and prosocial behaviour. Similarly, McMahon et al. [37] identified an interaction between empathy and gender in predicting prosocial behaviour, with the contributions was more pronounced for males than females. Reasons for gender differences are likely attributed to evolution, social desirability, communication and presentation skill [1], peer group dynamics [37] and gender specific neural mechanisms [36, 38, 39]. For example, Schulte-Ruther et al. [36] demonstrated that males and females rely on different neural strategies when assessing their own emotions in response to others.

This study also found affective empathy was positively associated with emotional problems for both genders, whereas Dadds [12] revealed cognitive empathy was associated with emotional problems for boys, and affective empathy was positively associated with emotional problems for girls only. So, future research should examine whether gender may account for the relations between empathy and various behaviours.

Generally, the results of age differences were in line with an early study [28]. In present study, both cognitive empathy and affective empathy increased with age, especially for the latter. Interestingly, the age differences for cognitive empathy is not only small in size, they are also curvilinear in growth. It demonstrated that the speed of development for cognitive empathy was unstable during different age periods. However, in view of the results of Dadds [12], more work is needed to be done to examine how empathy levels might change through life.

The significant but not strong relation between cognitive empathy and affective empathy of the Chinese version of BES ($r = .32$, $p < .01$) show that cognitive empathy and affective empathy are inter-correlated concepts included in empathy, but also highlights the unlikeness which might exist in the underlying components of cognitive empathy and affective empathy [12–16]. For example, an fMRI study [15] revealed that emotional empathy still engaged the mirror neuron system (MNS), thalamus, primary somatosensory and motor cortices when brain activation resulting from cognitive empathy was controlled.

This study supported previous findings of the BES moderate reliability [10, 11, 19]. In the current study, Cronbach's α of the scale were .72 for cognitive empathy, .73 for affective empathy. The 4 weeks test–retest correlations were .60 for cognitive, .71 for affective. The split-half reliability was .77. In British sample [11], internal consistency coefficients were .79 for cognitive and .85 for affective empathy; In Italian sample [19], internal consistency coefficients were .74 for cognitive empathy, and .86 for affective empathy; And in French sample [10], internal consistency coefficients were .66 for cognitive empathy, .77 for affective empathy, and that test–retest reliability were .54 for cognitive empathy, .70 for affective empathy. These results confirmed the stability of the BES between different cultures.

Summary

With fewer items, the Chinese version of BES is a simple and available self-rating scale with adequate reliability and validity. Further examination would be done to test its applicability in more fields, such as criminology, clinical and social psychology.

References

1. Lennon R, Eisenberg N (1987) Emotional displays associated with preschoolers' prosocial behavior. Child Dev 58(4):992–1000
2. Cohen D, Strayer J (1996) Empathy in conduct-disordered and comparison youth. Dev Psychol 32:988–998
3. Davis MH (1980) A multidimensional approach to individual differences in empathy. JSAS Catalog of Select Documents in psychology 10:85
4. Davis MH (1983) Measuring individual differences in empathy: evidence for a multidimensional approach. J Pers Soc Psychol 44:113–126
5. Jollife D, Farrington DP (2006) Examining the relationship between low empathy and bullying. Aggress Behav 32:540–550
6. McPhedran S (2009) A review of the evidence for associations between empathy, violence, and animal cruelty. Aggress Violent Behav 14:1–4
7. Lisak D, Ivan C (1995) Deficits in intimacy and empathy in sexually aggressive men. J Interpers Violence 10(3):296–308
8. Eisenberg N, Strayer J (eds) (1987) Empathy and its development. Cambridge: Cambridge University Press, New York
9. Feshbach ND, Feshbach S (1987) Affective processes and academic achievement. Child Dev 58(5):1335–1347
10. D'Ambrosio F, Olivier M, Didon D, Besche C (2009) The Basic Empathy Scale: a French validation of a measure of empathy in youth. Pers Individ Differ 46:160–165
11. Jollife D, Farrington DP (2006) Development and validation of the Basic Empathy Scale. J Adolesc 29:589–611
12. Dadds MR, Hunter K, Hawes DJ, Frost ADJ, Vassallo S, Bunn P et al (2008) A measure of cognitive and affective empathy in children using parent ratings. Child Psychiatry Hum Dev 39:111–122
13. Gery I, Miljkovitch R, Berthoz S, Soussignan R (2009) Empathy and recognition of facial expressions of emotion in sex offenders, non-sex offenders and normal controls. Psychiatry Res 165:252–262
14. Jollife D, Farrington DP (2004) Empathy and offending: a systematic review and meta-analysis. Aggress Violent Behav 9:441–476

15. Nummenmaa L, Hirvonen J, Parkkola R, Hietanen JK (2008) Is emotional contagion special? an fMRI study on neural systems for affective and cognitive empathy. NeuroImage 43:571–580
16. Jabbi M, Swart M, Keysers C (2007) Empathy for positive and negative emotions in the gustatory cortex. Neuroimage 34:1744–1753
17. Hogan R (1969) Development of an empathy scale. J Consult Clin Psychol 33:307–316
18. Mehrabian A, Epstein N (1972) A measure of emotional empathy. J Pers 40:525–543
19. Albiero P, Matricardi G, Speltri D, Toso D (2009) The assessment of empathy in adolescence: a contribution to the Italian validation of the "Basic Empathy Scale". J Adolesc 32:393–408
20. Kleinman A (1980) Patients and healers in the context of culture. University of California press, Berkeley
21. Yang DS (2000) Foundation of psychiatry, 3rd edn. Hunan science & technology press, Changsha
22. Zhang FF, Dong Y, Wang K, Zhan ZY, Xie LF (2010) Reliability and validity of the Chinese version of the interpersonal reactivity index-C. Chin J Clin Psychol 18(2):155–157
23. Lovett BJ, Sheffield RA (2007) Affective empathy deficits in aggressive children and adolescents: a critical review. Clin Psychol Rev 27:1–13
24. Miller PA, Eisenberg N (1988) The relation of empathy to aggressive and externalizing/antisocial behavior. Psychol Bull 103:324–344
25. de Wied M, Goudena PP, Matthys W (2005) Empathy in boys with disruptive behaviour disorders. J Child Psychol Psychiatry 46:867–880
26. Bjorkqvist K, Osterman K (2000) Social intelligence—empathy = Aggression? Aggress Violent Behav 5(2):191–200
27. Ding F, Guo Y (2010) The relationship of theory og mind and empathy with prosocial behaviour. Psychol Sci 33:660–662
28. Ellis PL (1982) Empathy: a factor in antisocial behavior. J Abnorm Child Psychol 10:123–134
29. Li L (1990) The relationship between empathy and prosocial behavior in adolescents. Acta Psychologica Sinica 1:72–79
30. Hojat M, Gonnella JS, Nasca TJ (2002) The Jefferson scale of physician empathy: further psychometric data and differences by gender and specialty at item level. Acad Med (supplement) 77:560–572
31. An XQ, Yang H, Xu JP, Song LP, Qiu YF (2008) Compilation and evaluation of Jefferson empathy scale. Chin Nurs Res 22(8):2063–2066
32. Goodman R (1997) The strengths and difficulties questionnaire: a research note. J Child Psychol Psychiatry 38:581–586
33. Kou JH, Du YS, Xia LM (2007) Formulation of children strengths and difficulties questionnaire (the edition for students) for Shanghai Norm. China J Health Psychol 15(1):3–5
34. Hau KT, Wen Z, Cheng Z (2004) Structural equation model and its applications. Educational Science Press, Beijing
35. Su LY, Wang K, Fan F, Su Y, Gao XP (2008) Reliability and validity of the screen for children anxiety related emotional disorder (SCARED) in Chinese children. J Anxiety Disord 22:612–621
36. Schulte-Ruther M, Markowitsch HJ, Shah NJ, Fink GR, Piefke M (2008) Gender differences in brain networks supporting empathy. NeuroImage 43:393–403
37. McMahon SD, Wernsman J, Parnes AL (2006) Understanding prosocial behavior: the impact of empathy and gender among African American adolescents. J Adolesc Health 39:135–137
38. Han SH, Fan Y, Mao LH (2008) Gender difference in empathy for pain: an electrophysiological investigation. Brain Res 1196:85–93
39. Rueckert L, Naybar N (2008) Gender differences in empathy: the role of the right hemisphere. Brain Cogn 67:162–167