<table>
<thead>
<tr>
<th>Title</th>
<th>Psychometric properties of the Chinese version of the prosocial and antisocial behaviour in sport scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Chunxiao Li, Koon Teck Koh and Qiang Guo</td>
</tr>
<tr>
<td>Source</td>
<td><em>International Journal of Sport and Exercise Psychology</em>, 16(5), 465-475</td>
</tr>
<tr>
<td>Published by</td>
<td>Taylor &amp; Francis (Routledge)</td>
</tr>
</tbody>
</table>

Copyright © 2016 Taylor & Francis

This is an Accepted Manuscript of an article published by Taylor & Francis in *International Journal of Sport and Exercise Psychology* on 28/10/2016, available online: http://www.tandfonline.com/10.1080/1612197X.2016.1256342

Notice: Changes introduced as a result of publishing processes such as copy-editing and formatting may not be reflected in this document. For a definitive version of this work, please refer to the published source.

Psychometric Properties of the Chinese Version of the Prosocial and Antisocial Behaviour in Sport Scale

Chunxiao Li
The Education University of Hong Kong

Koon Teck Koh
Nanyang Technological University

Qiang Guo
Shangqiu University

Author Note

Chunxiao Li is with the Department of Health and Physical Education, The Education University of Hong Kong. Koon Teck Koh is with National Institute of Education, Nanyang Technological University. Qiang Guo is with Shangqiu University.

We would like to thank The Education University of Hong Kong for providing financial support to this research (RG26/14-15R). We would also like to thank all our helpers and participants.

Correspondence concerning this manuscript should address Chunxiao Li, Department of Health and Physical Education, The Education University of Hong Kong, 10 Lo Ping Road, Tai Po, New Territories, Hong Kong, Tel: +852 2948 8913, E-mail: cxlilee@gmail.com.

To cite this article:
Abstract

The Prosocial and Antisocial Behaviour in Sport Scale (PABSS) has recently been developed and used in various cultures and contexts to measure athletes’ moral behaviours. This research aimed to examine the psychometric properties of a translated Chinese version of PABSS. A sample of 390 Chinese student athletes (male = 313, female = 75, missing = 2) were recruited from a tertiary institution. They completed the Chinese version of PABSS and two scales measuring fear of failure and intrinsic motivation. The PABSS data were split into two sub-samples and subjected to two confirmatory factor analyses. The results supported the four-factor structure of the Chinese translated PABSS. The four subscales of the PABSS evidenced hypothesised relationships between fear of failure and intrinsic motivation. The PABSS demonstrated adequate internal reliability and were invariant across age. Overall, the findings suggest the Chinese version of PABSS has adequate psychometric properties to measure moral behaviours in sport.

Keywords: moral behaviour, validation, reliability, sport, China
MORAL BEHAVIOURS

Psychometric Properties of the Chinese Version of the Prosocial and Antisocial Behaviour in Sport Scale

Numerous physical and psychological benefits have been associated with participation in sport (e.g., Bailey, 2006; Etnier et al., 1997). Sport participation has been found to promote positive behaviours such as supporting teammates or helping injured opponents while reducing negative behaviours such as intimidating and injuring other players (Kavussanu, 2012). Indeed, sport has been deemed as a platform conducive to the development of moral character, life skills, and values that can benefit individuals’ personal growth such as interpersonal and intrapersonal competencies, all of which are important in later parts of life (Gould & Carson, 2008). Given the demonstrated potential of sport in fostering the development of positive life skills and values, it is not surprising that policy makers would want to harness sport to make significant and distinctive contributions to the positive development of individuals and the wider society (Bailey et al., 2009).

It is important to understand that positive developmental outcomes do not emerge automatically from mere participation in sport. Poor sportsmanship, decline in moral reasoning, discrimination, racism, aggression, and win-at-all cost attitudes that distort fair play have also been associated with sport participation (May, 2001). Indeed, studies have shown that when programmes are efficiently delivered by trained coaches, sport participation has been associated with fair-play, moral reasoning, and desired behaviours among children and adolescents (e.g., Koh, Ong, & Camiré, 2016; Mouratidou, Goutza, & Chatzopoulos, 2007; Vidoni & Ward, 2009).

Social cognitive theory and moral behaviours

The social cognitive theory (Bandura, 1991) has been used to explain moral deliberation and desired behaviours. According to the theory, individuals develop moral standards from a variety of influences (e.g., observing the behaviours of peers, parents, and
other adults). These moral standards regulate behaviours through self-reflection and self-directed reactions (Kavussanu, Stanger, & Boardley, 2013). Therefore, people behave in ways that match their moral standards, and refrain from behaving in ways that would bring disapproval from themselves or others. Indeed, Bandura (1991) has distinguished between proactive morality, which is the power to behave humanely, and inhibitive morality, which is the power to refrain from behaving inhumanely. These two dimensions have also been studied as prosocial and antisocial behaviours in the sport setting (Kavussanu, Stanger, et al., 2013).

Prosocial behaviour refers to any act intended to help or benefit others such as helping an opponent get up from a fall (Eisenberg, Fabes, & Spinrad, 1998), while antisocial behaviour refers to any act intended to harm or disadvantage others such as trying to injure an opponent, and cheating (Sage, Kavussanu, & Duda, 2006). As Kavussanu and Boardley (2009) argued, examining both prosocial and antisocial behaviours provides a more complete understanding of the moral conduct commonly found in sport (both targeting at the opponents or teammates). In fact, studies have shown that behaviours could vary depending on the person at the receiving end of the behaviour displayed. In particular, while a range of physical (e.g., physical intimidation) and verbal (e.g., winding up) antisocial behaviours toward opponents have been reported, only the latter (e.g., criticism) have been observed to be inflicted on teammates (Kavussanu, Seal, & Phillips, 2006; Kavussanu, Stamp, Slade, & Ring, 2009). Interestingly however, physical and verbal prosocial acts like congratulating, encouraging and offering help when an injury occurs have been displayed toward both teammates and opponents (Kavussanu, Boardley, Sagar, & Ring, 2013). Therefore, there is a need for further probing into why athletes display prosocial and/or antisocial sport behaviours toward their teammates and/or opponents, and how such behaviours can be appropriately
measured to advance our knowledge and understanding of the common moral behaviours
display in the sport settings (Kavussanu & Boardley, 2009).

**Prosocial and Antisocial Behaviours in Sport Scale**

In an effort to investigate moral behaviours in sport, the Prosocial and Antisocial Behaviours in Sport Scale (PABSS; Kavussanu & Boardley, 2009) was developed. Specifically, this instrument is comprised of four subscales, namely antisocial behaviour toward teammates, prosocial behaviour toward teammates, antisocial behaviour toward opponents, and prosocial behaviour toward opponents. The internal reliability, test-retest reliability, factorial validity, discriminant validity, and concurrent validity of the scale have been supported among British samples (Kavussanu & Boardley, 2009; Kavussanu, Stanger, et al., 2013). Li, Koh, Wang, and Chian (2015) took a step further and examined the psychometric properties of the PABSS on 574 young athletes (13-17 years) in the Singapore context. They confirmed the four-structure of the PABSS and concluded that the PABSS can be used to measure prosocial and antisocial behaviours among young athletes in Singapore.

A body of studies employing the PABSS has also been conducted using athletes from England (Boardley & Kavussanu, 2010), Australia (Boardley & Jackson, 2012), North America (Bolter & Weiss, 2013), and New Zealand (Hodge & Gucciardi, 2015) and some interesting findings were revealed. For example, prosocial behaviour toward opponents has been positively associated with empathy (Kavussanu & Boardley, 2009) while antisocial behaviour has been positively related to moral disengagement (Boardley & Kavussanu, 2010; Hodge & Gucciardi, 2015). Such findings provide useful information for sport associations, coaches, practitioners and researchers to better understand athletes’ behaviour in sport participation and guide their policies and practices.

Although the PABSS is a promising instrument that has achieved reliability and validity across western and eastern culture samples and also across different age groups in
measuring moral behaviours in the sport setting (e.g., Kavussanu & Boardley, 2009; Kavussanu, Stanger, et al., 2013; Li et al., 2015), most studies have surveyed respondents from western countries, and very few studies have been found to do so among Chinese individuals. Indeed, Moustaka, Vlachopoulos, Vazou, Kaperoni, and Markland (2010) argued the need for translation of instruments into other languages in order to extend the applicability of the theory and model across cultures and nations. Kavussanu, Stanger, et al. (2013) also noted that “a body of literature using the PABSS has started to emerge revealing potential antecedents of prosocial and antisocial sport behaviours” (p. 1209). These comments made by researchers further underscore the importance of this instrument and the need to provide further evidence for its psychometric properties.

Regarding the concurrent validity of the PABSS, its subscales were found to be associated with several theoretically related constructs, including anger, empathy, goal orientations, hostility, and moral identity (Kavussanu & Boardley, 2009; Kavussanu, Stanger, et al., 2013). To provide further evidence on the concurrent validity of the scale, it is important to examine the relationships between the PABSS subscales and other psychological constructs such as fear of failure and intrinsic motivation. Fear of failure is a dispositional tendency that orients an individual to avoid engaging in achievement related activities (Conroy & Elliot, 2004). An individual who has a greater tendency for fear of failure tends to adopt aggressive self-regulatory strategies, which are associated with hostile and antisocial behaviours (Conroy & Elliot, 2004). Research has also shown that fear of failure is positively related to antisocial behaviours in sport (Sagar, Boardley, & Kavussanu, 2011). According to the self-determination theory (Deci & Ryan, 2000), athletes who are intrinsically motivated are expected to enjoy the process of doing sport and act in a prosocial manner. On the other hand, those who are not intrinsically motivated will focus more on the outcome and act immorally. Empirical studies have found that intrinsically motivated athletes are more likely
to show prosocial behaviours and less likely to behave immorally (e.g., Hodge & Lonsdale, 2011; Vansteenkiste, Mouratidis, & Lens, 2010).

The current study

The purpose of this survey study was to examine the psychometric properties of the Chinese translated PABSS to establish whether it can be used to measure sport moral behaviours in eastern cultures such as mainland China. Specifically, factorial validity, discriminant validity, concurrent validity, and internal reliability of the scale were examined. As discussed above, we selected fear of failure and intrinsic motivation for further examining the concurrent validity of the PABSS. Although it would provide further evidence on the concurrent validity of the PABSS, we did not measure participants’ extrinsic motivation in this survey. This is to reduce response burden and increase data quality (Backstrom & Hursh-Cesar, 1981).

Method

Participants

A sample of 390 student athletes between 13 and 26 years old ($M = 20.11$, $SD = 2.61$) were recruited for this study. Most of them were male (male = 313, female = 75, missing = 2). The participants were drawn from the sports department within the first author’s institution. They represented a variety of team sports, including basketball ($n = 278$), handball ($n = 8$), netball ($n = 4$), soccer ($n = 70$), rugby ($n = 9$), and water polo ($n = 3$). Eighteen participants did not indicate their sport. The participants had an average of 4.53 ($SD = 3.42$) years of playing experience in their sport.

Measure

Moral behaviours. Participants’ prosocial and antisocial behaviours were measured using the Chinese version of PABSS. The first author and the third author who are bilingual in Chinese and English translated the original PABSS (Kavussanu & Boardley, 2009) into the
Chinese language. The Chinese version of PABSS was then translated back to English by another two bilingual researchers who specialised in sport psychology. This procedure allowed the research team to compare and contrast the two versions of the PABSS and made further changes to the translations done with the aim of ensuring that the instrument remains valid and reliable (Brislin, 1980). To examine the face validity of the Chinese translated PABSS, the scale was administered to 15 athletes. These athletes were asked to give comments on the ease of understanding of each item and no changes were required.

The translated Chinese PABSS has 20 items (i.e., same as the original PABSS) measuring four moral behaviours in sport: a) prosocial behaviour toward teammates (four items; e.g., “Gave positive feedback to a teammate”), b) prosocial behaviour toward opponents (three items; e.g., “Helped an opponent off the floor”), c) antisocial behaviour toward teammates (five items; e.g., “Argued with a teammate”), and d) antisocial behaviour toward opponents (eight items; e.g., “Criticised an opponent”). Participants responded to the items on a five-point Likert scale (1 = “never”; 5 = “very often”).

Fear of failure. Participants’ experience on fear of failure was evaluated through the Performance Failure Appraisal Inventory-Short Form (Conroy, Willow, & Metzler, 2002). This inventory has five items (e.g., “When I am failing, I am afraid that I might not have enough talent”). The reliability and validity of the inventory have been supported among Chinese students (Wang & Sun, 2009). Participants provided responses on a 5-point Likert scale (1 = “do not believe at all”, 5 = “believe 100% of the time”).

Intrinsic motivation. The intrinsic motivation subscale from the Chinese Sport Motivation Scale-II (Li, Kawabata, & Zhang, 2016) was used to measure participants’ intrinsic motivation (i.e., doing sport for its own sake). This subscale is comprised of three items (e.g., “Because I find it enjoyable to discover new performance strategies”). The reliability and validity of the scale were generally adequate with Chinese athletes (Li et al.,
2016). Participants gave responses to the three items on a 7-point Likert scale (1 = “not true at all”, 7 = “very true”).

**Procedures**

Ethical clearance was obtained from first author’s institution. Athletes were then invited to participate in the survey via respective heads of sports department within the institution. Upon securing informed consent from participants or their guardians, research assistants administered the survey in a quiet classroom. The participants were informed that participation in the study was voluntary and they have the right to withdraw at any time. They were also informed that there were no right or wrong answers for their responses and were encouraged to give their honest responses as confidentiality was assured. They took about 10 minutes on average to complete the survey.

**Data analysis**

The data set was randomly split into two samples with each sample having approximately 50% of the whole cases. Sample 1 (n = 194) was used as a calibration sample (i.e., initially examine the factor structure of the scale). Sample 2 (n = 196) was utilised as a validation sample (i.e., confirm the found factor structure). Confirmatory factor analysis (CFA) was used to examine the four-factor structure of the 20-item Chinese version of PABSS using EQS 6.1 (Bentler & Wu, 2005). The robust maximum likelihood estimation procedure or SB$\chi^2$ was applied (Mardia’s coefficient = 40.62, Normalised Estimate = 13.52) (Chou & Bentler, 1995). Multiple fit indices such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR) were used for assessing model fit. A cut-off value of .90 and .95 for CFI/TLI represents adequate and good fit, respectively. A cut-off value of .08 and .06 for RMSEA/SRMR indicates adequate and good fit, respectively (Hu & Bentler, 1999; Marsh, Hau, & Wen, 2004).
To assess the concurrent validity of the Chinese version of PABSS, latent factor correlations among subscale scores of the Chinese PABSS, fear of failure, and intrinsic motivation were computed. A latent factor correlation between two factors lower than .80 suggests adequate discriminant validity (Kline, 2005). Finally, multiple-group invariance tests across two age groups (younger group = 13-20 years, senior group = 21-26 years) were conducted to examine whether different group members interpret scale items in the same way. The younger group had 193 participants (male = 147, female = 45, missing = 1), and the senior group included 197 participants (male = 166, female = 30, missing = 1). Configural, metric, and scalar invariance were examined. As examining the error variance invariance is of little interest and usually considered unnecessary (Byrne, 2006), we did not examine it. Readers who are interested in understanding the detailed procedure to conduct group invariance tests can refer to the work by Byrne (2006). A non-significant SB$\chi^2$ statistic, a change of CFI no greater than .01 between the restricted and unrestricted models, and a change in RMSEA smaller than .015 between the two competing models suggest group invariance (Byrne, 2006; Chen, 2007).

**Results**

**Factorial and discriminant validity**

The Sample 1 data showed adequate fit to the four-factor structure model: SB$\chi^2$ = 235.52, CFI = .94, TLI = .93, RMSEA = .048 (.033, .060), SRMR = .068. Factor loadings ranged from .53 to .84. Adequate discriminant validity was found as none of the factor correlations exceeded .80 ($\phi = -.13$ to .77). The Sample 2 data confirmed the four-factor structure for the Chinese PABSS: SB$\chi^2$ = 274.59, CFI = .91, TLI = .89, RMSEA = .058 (.046, .077), SRMR = .070. Item factor loadings were higher than .50 (.54 to .83). Again, none of the latent factor correlations were higher than .80 (-.33 to .72). We also conducted
CFA with the combined sample and found adequate fit to the four-factor measurement model:

\[ SB\chi^2_{(164)} = 336.23, \ CFI = .93, \ TLI = .92, \ RMSEA = .052 \ (0.044, .060), \ SRMR = .062. \]

Concurrent validity and internal reliability

As expected, fear of failure was positively correlated with antisocial behaviours toward teammates (\( \phi = .38 \)) and opponents (\( \phi = .36 \)) in the latent correlation matrix. There were negative correlations between fear of failure and prosocial behaviours (\( \phi = -.13/-.21 \)). In line with SDT, intrinsic motivation was positively correlated with prosocial behaviours and negatively related to antisocial behaviours. Intrinsic motivation had stronger correlations with prosocial behaviours (\( \phi = .30/.53 \)) than with antisocial behaviours (\( \phi = -.12/-.19 \)). The four PABSS subscales, the Performance Failure Appraisal Inventory-Short Form, and the intrinsic motivation subscale, achieved adequate internal reliability (\( \alpha = .69 \) to .87; see Table 2).

Group invariance

The results of multi-group invariance tests are displayed in Table 3. We found adequate model fit for younger (\( SB\chi^2_{(164)} = 261.34, \ CFI = .93, \ TLI = .92, \ RMSEA = .055 \ [0.043, .068], \ SRMR = .068 \)) and senior groups (\( SB\chi^2_{(164)} = 268.16, \ CFI = .92, \ TLI = .90, \ RMSEA = .057 \ [0.044, .069], \ SRMR = .064 \)). The adequate model fit among each group enabled us to examine the configural invariance across the two age groups. The configural invariance was supported, \( SB\chi^2_{(328)} = 529.51, \ CFI = .93, \ TLI = .91, \ RMSEA = .056 \ (.047, .065), \ SRMR = .066 \). Building upon the configural model, we found that there were no significant differences between configural model and metric model (\( \Delta SB\chi^2_{(16)} = 13.60, \ p = .63, \ \Delta CFI = .001, \ \Delta RMSEA = .002 \)) as well as between configural model and scalar model (\( \Delta SB\chi^2_{(36)} = 41.05, \ p = .26, \ \Delta CFI = .003, \ \Delta RMSEA = .002 \)). These results demonstrate that the two age groups interpreted the scale items in the same way.

Discussion
The PABSS was developed to measure prosocial and antisocial behaviours toward teammates and opponents, which contributed to the proliferation of sport morality research (Kavussanu & Boardley, 2009). To further examine the psychometric properties of the PABSS and promote the sport morality research in other contexts, this paper was the first to validate the Chinese version of PABSS among student athletes in China. The results generally supported the reliability and validity of the Chinese PABSS.

The four-factor of the Chinese version of PABSS was replicated to student athletes in China. Using two CFAs with two samples to examine the factorial validity of the PABSS increases rigor of our analyses (Kline, 2005). The emerged factor structure of the current research is consistent with the original scale of PABSS (Kavussanu & Boardley, 2009). The latent factor correlations among the four subscales of the Chinese PABSS were below .80, which means the scale had adequate discriminant validity (Kline, 2005).

Concurrent validity of the translated PABSS was also examined in this research. Parallel to early research, measure on fear of failure was positively and moderately related to antisocial behaviours (Sagar et al., 2011). Athletes who score higher on fear of failure are more likely to adopt aggressive self-regulatory strategies, which will result in antisocial behaviours (Conroy & Elliot, 2004). We also examined the relationships between the four PABSS subscales and intrinsic motivation in this research. In line with self-determination theory (Deci & Ryan, 2000) and early studies (e.g., Hodge & Lonsdale, 2011; Vansteenkiste et al., 2010), intrinsic motivation was positively related to prosocial behaviours and negatively associated with antisocial behaviours. Intrinsically motivated athletes tend to act in line with their positive values and sense of self, and thus engage in prosocial behaviours (Deci & Ryan, 2000). Concurrent validity of the original PABSS was supported in previous studies (Kavussanu & Boardley, 2009; Kavussanu, Stanger, et al., 2013), in which associations between the PABSS subscales and theoretically related outcomes or variables
(i.e., anger, empathy, goal orientations, hostility, and moral identity) were evidenced. Therefore, the present study further evidenced the concurrent validity of PABSS.

With regards to the internal reliability of the translated scale, the alpha coefficient of the prosocial behaviour toward opponents was .69, which was slightly below the traditional cut-off value (.70). The issue of low alpha coefficient of the subscale was also found in an early research (Kavussanu, Stanger, et al., 2013). It is worthy to note that the problem did not emerge in other past validation studies (Kavussanu & Boardley, 2009; Li et al., 2015). One of the possible reasons could be that this subscale had only three items and the number of items in a scale can influence the coefficient alpha. The coefficient alpha is negatively associated with the number of items (Cortina, 1993). Therefore, it might be necessary to add more items to this subscale for future studies.

Limitations and future research directions

As outlined above, this research has several theoretical and practical contributions (e.g., examined the Chinese translated PABSS). However, a few limitations should be acknowledged. Firstly, participants were student athletes. Thus, the findings may not be generalised to other populations without similar characteristics such as age and sport. Secondly, although we found that the two age groups interpreted the PABSS items in the same way, the small sample size of this research precluded multiple group invariance tests across gender and sport. Future research needs to recruit more participants to run these tests so that valid group comparisons (e.g., gender, sport) of the subscale scores can be conducted.

In addition, other psychometric properties of the Chinese PABSS such as concurrent validity (e.g., extrinsic motivation), test-retest reliability, and sensitivity should also be examined. Finally, future work could observe whether the self-reported moral behaviours through the PABSS correspond to the actual moral behaviours observed during training and competitions.
(Kavussanu, Stanger, et al., 2013). This would provide valuable information as to the predictive value of the PABSS.

**Conclusion**

This research supports the factorial validity, discriminant validity, and concurrent validity, and internal reliability of the Chinese version of PABSS. Having provided an established measurement instrument for research in related fields, it is believed that the use of the scale is likely to help proliferate morality research in sport, especially in the Chinese-speaking communities.
References


### Table 1

#### Standardized Factor Loadings ($\lambda$) across Samples 1 and 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Item Content</th>
<th>Sample 1 ($n = 194$)</th>
<th>Sample 2 ($n = 196$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT1</td>
<td>Gave positive feedback to a teammate</td>
<td>.65</td>
<td>.62</td>
</tr>
<tr>
<td>AO1</td>
<td>Criticised an opponent</td>
<td>.65</td>
<td>.67</td>
</tr>
<tr>
<td>AT1</td>
<td>Argued with a teammate</td>
<td>.65</td>
<td>.68</td>
</tr>
<tr>
<td>PO1</td>
<td>Helped an opponent off the floor</td>
<td>.57</td>
<td>.57</td>
</tr>
<tr>
<td>AO2</td>
<td>Deliberately fouled an opponent</td>
<td>.59</td>
<td>.60</td>
</tr>
<tr>
<td>PO2</td>
<td>Asked to stop play when an opponent was injured</td>
<td>.53</td>
<td>.70</td>
</tr>
<tr>
<td>AT2</td>
<td>Verbally abused a teammate</td>
<td>.84</td>
<td>.79</td>
</tr>
<tr>
<td>PT2</td>
<td>Encouraged a teammate</td>
<td>.71</td>
<td>.78</td>
</tr>
<tr>
<td>AO3</td>
<td>Retaliated after a bad foul</td>
<td>.75</td>
<td>.76</td>
</tr>
<tr>
<td>PO3</td>
<td>Helped an injured opponent</td>
<td>.81</td>
<td>.75</td>
</tr>
<tr>
<td>AT3</td>
<td>Criticised a teammate</td>
<td>.76</td>
<td>.72</td>
</tr>
<tr>
<td>PT3</td>
<td>Gave constructive feedback to a teammate</td>
<td>.77</td>
<td>.61</td>
</tr>
<tr>
<td>AO4</td>
<td>Tried to wind up an opponent</td>
<td>.72</td>
<td>.73</td>
</tr>
<tr>
<td>AT4</td>
<td>Swore at a team-mate</td>
<td>.77</td>
<td>.83</td>
</tr>
<tr>
<td>PT4</td>
<td>Congratulated a teammate for good play</td>
<td>.62</td>
<td>.58</td>
</tr>
<tr>
<td>AO5</td>
<td>Tried to injure an opponent</td>
<td>.80</td>
<td>.71</td>
</tr>
<tr>
<td>AO6</td>
<td>Intentionally distracted an opponent</td>
<td>.70</td>
<td>.75</td>
</tr>
<tr>
<td>AT5</td>
<td>Showed frustration at a teammate’s poor play</td>
<td>.63</td>
<td>.64</td>
</tr>
<tr>
<td>AO7</td>
<td>Intentionally broke the rules of the game</td>
<td>.58</td>
<td>.54</td>
</tr>
<tr>
<td>AO8</td>
<td>Physically intimidated an opponent</td>
<td>.64</td>
<td>.58</td>
</tr>
</tbody>
</table>
Notes. AT = Antisocial Behaviour toward Teammates, PT = Prosocial Behaviour toward Teammates, AO = Antisocial Behaviour toward Opponents, PO = Prosocial Behaviour toward Opponent.
### Table 2

*Descriptive Statistics, Correlations, and Internal Reliability*

<table>
<thead>
<tr>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>α</th>
<th>AT</th>
<th>PT</th>
<th>AO</th>
<th>PO</th>
<th>FF</th>
<th>IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>1-5</td>
<td>1.93</td>
<td>.67</td>
<td>.85</td>
<td>-</td>
<td>-.16**</td>
<td>.64**</td>
<td>.03</td>
<td>.25**</td>
</tr>
<tr>
<td>PT</td>
<td>1-5</td>
<td>3.78</td>
<td>.66</td>
<td>.76</td>
<td>-.24**</td>
<td>-</td>
<td>-.07</td>
<td>.34**</td>
<td>-.13*</td>
</tr>
<tr>
<td>AO</td>
<td>1-5</td>
<td>1.93</td>
<td>.62</td>
<td>.87</td>
<td>.78**</td>
<td>-.11*</td>
<td>-</td>
<td>.01</td>
<td>.26**</td>
</tr>
<tr>
<td>PO</td>
<td>1-5</td>
<td>3.17</td>
<td>.79</td>
<td>.69</td>
<td>-02</td>
<td>.44**</td>
<td>-.04</td>
<td>-</td>
<td>-.09</td>
</tr>
<tr>
<td>FF</td>
<td>1-5</td>
<td>2.50</td>
<td>.67</td>
<td>.71</td>
<td>.38**</td>
<td>-.21**</td>
<td>.36**</td>
<td>-.13*</td>
<td>-</td>
</tr>
<tr>
<td>IM</td>
<td>1-7</td>
<td>5.20</td>
<td>1.13</td>
<td>.77</td>
<td>-.19**</td>
<td>.53**</td>
<td>-.12*</td>
<td>.30**</td>
<td>-.19**</td>
</tr>
</tbody>
</table>

*Notes.* Latent factor correlations are presented below the diagonal and zero-order correlations are presented above the diagonal. AT = Antisocial Behaviour toward Teammates, PT = Prosocial Behaviour toward Teammates, AO = Antisocial Behaviour toward Opponents, PO = Prosocial Behaviour toward Opponent, FF = Fear of Failure, IM = Intrinsic Motivation.

*p < .05, **p < .01.*
Table 3

Results of Multiple Group Invariance Test (younger group = 193, senior group = 197)

<table>
<thead>
<tr>
<th>Model</th>
<th>SBχ² (df)</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA (90% CI)</th>
<th>SRMR</th>
<th>ΔSBχ² (Δdf)</th>
<th>ΔCFI</th>
<th>ΔRMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Younger group</td>
<td>261.34(164)</td>
<td>.934</td>
<td>.924</td>
<td>.055 (.043, .068)</td>
<td>.068</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Model 2: Senior group</td>
<td>268.16(164)</td>
<td>.916</td>
<td>.903</td>
<td>.057 (.044, .069)</td>
<td>.064</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Model 3: Configural invariance</td>
<td>529.51(328)</td>
<td>.926</td>
<td>.914</td>
<td>.056 (.047, .065)</td>
<td>.066</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Model 4: Metric invariance</td>
<td>542.96(344)</td>
<td>.927</td>
<td>.919</td>
<td>.054 (.046, .063)</td>
<td>.069</td>
<td>3 vs. 4</td>
<td>.001</td>
<td>.002</td>
</tr>
<tr>
<td>Model 5: Scalar invariance</td>
<td>572.67(364)</td>
<td>.923</td>
<td>.920</td>
<td>.054 (.046, .063)</td>
<td>.073</td>
<td>3 vs. 5</td>
<td>41.05(36)</td>
<td>.003</td>
</tr>
</tbody>
</table>

Notes. SBχ² = Satorra-Bentler scale chi-square, df = degree of freedom, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, CI = confidence interval.
## Appendix

### Scale Items

<table>
<thead>
<tr>
<th></th>
<th>PABSS</th>
<th>Chinese PABSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT1</td>
<td>Gave positive feedback to a teammate</td>
<td>给队友正面的反馈</td>
</tr>
<tr>
<td>AO1</td>
<td>Criticised an opponent</td>
<td>批评对方球员</td>
</tr>
<tr>
<td>AT1</td>
<td>Argued with a teammate</td>
<td>和队友争吵</td>
</tr>
<tr>
<td>PO1</td>
<td>Helped an opponent off the floor</td>
<td>把倒在地上的对方球员拉起来</td>
</tr>
<tr>
<td>AO2</td>
<td>Deliberately fouled an opponent</td>
<td>故意对对方球员犯规</td>
</tr>
<tr>
<td>PO2</td>
<td>Asked to stop play when an opponent was injured</td>
<td>当发现对方球员受伤时，要求中断比赛</td>
</tr>
<tr>
<td>AT2</td>
<td>Verbally abused a teammate</td>
<td>辱骂队友</td>
</tr>
<tr>
<td>PT2</td>
<td>Encouraged a teammate</td>
<td>鼓励队友</td>
</tr>
<tr>
<td>AO3</td>
<td>Retaliated after a bad foul</td>
<td>报复对方球员对我方的犯规</td>
</tr>
<tr>
<td>PO3</td>
<td>Helped an injured opponent</td>
<td>帮助对方受伤的球员</td>
</tr>
<tr>
<td>AT3</td>
<td>Criticised a teammate</td>
<td>批评队友</td>
</tr>
<tr>
<td>PT3</td>
<td>Gave constructive feedback to a teammate</td>
<td>给队友有用的反馈</td>
</tr>
<tr>
<td>AO4</td>
<td>Tried to wind up an opponent</td>
<td>朝对方球员发火</td>
</tr>
<tr>
<td>AT4</td>
<td>Swore at a team-mate</td>
<td>跟队友发火</td>
</tr>
<tr>
<td>PT4</td>
<td>Congratulated a teammate for good play</td>
<td>祝贺表现好的队友</td>
</tr>
<tr>
<td>AO5</td>
<td>Tried to injure an opponent</td>
<td>试图让对方球员受伤</td>
</tr>
<tr>
<td>AO6</td>
<td>Intentionally distracted an opponent</td>
<td>故意干扰对方球员</td>
</tr>
<tr>
<td>AT5</td>
<td>Showed frustration at a teammate’s poor play</td>
<td>对表现不好的队友表示不满</td>
</tr>
<tr>
<td>AO7</td>
<td>Intentionally broke the rules of the game</td>
<td>故意制造犯规</td>
</tr>
<tr>
<td>AO8</td>
<td>Physically intimidated an opponent</td>
<td>使用肢体动作吓唬对手</td>
</tr>
</tbody>
</table>

*Notes.* AT = Antisocial Behaviour toward Teammates, PT = Prosocial Behaviour toward Teammates, AO = Antisocial Behaviour toward Opponents, PO = Prosocial Behaviour toward Opponent.