

# Development and Psychometric Examinations of a Simplified Chinese Mandarin Translation and Adaptation of the Adjustment Scales for Children and Adolescents

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## Abstract

*An absence of empirically validated scales limits the assessment of youth psychopathology in Chinese schools. The present study reports on the development and initial assessment of psychometric properties of a simplified Chinese Mandarin translation and adaptation of the Adjustment Scales for Children and Adolescents, a teacher-report behavior rating scale with a representative U.S. standardization sample. Comparisons of a large sample (n = 554) of Chinese elementary school students (Grade 1-6) with an age and grade matched sample (n = 709) from the ASCA standardization data found similar base rates of positive behaviors, rare problem behaviors, and common problem behaviors, suggesting cross-cultural similarity. Scale level assessment found no meaningful differences between the Chinese sample and the age and grade matched ASCA standardization sample in mean raw scores for ASCA core syndromes, supplementary syndromes, or global adjustment scales, as all effect sizes were trivial. Implications and suggestions for future research are discussed.*

## Introduction

Identification and awareness of psychopathology in children and adolescents are essential for planning and delivering mental health services in schools. Although Western nations have developed many standardized screening and diagnostic psychopathology measures, the Western instrument cannot be assumed to have the same clinical utility for Chinese individuals because of the remarkable differences between the societies. China is a country with a long civilization history and unique culture. Confucian philosophy and collectivist culture greatly impact mainland Chinese values, moral standards, and judgment of acceptable and unacceptable behaviors in the Chinese social context.

Cross-cultural psychologists question the wisdom of importing psychological measures across cultures. There are numerous challenges in cross-cultural assessment. First, differential item response or base rates, and bias, may occur. An anxiety scale item is biased if not equally endorsed across cultures (van de Vijver, 2000). As a result, some frequently endorsed items for children in American culture may result in infrequent or null endorsements in Chinese culture. Different response patterns to a stimulus may occur among people with different cultural backgrounds. Second, test bias may result from result interpretation. When used across cultural groups for which

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they are not normed, psychopathology measures may be negatively interpreted based on Western perspectives (Rogler, Malgady, & Rodriguez, 1989). For example, in Western society, shyness-inhibition may be a dispositional characteristic linked to internalizing problems such as negative self-regard (e.g., Rubin, LeMare, & Lollis, 1990). However, in Chinese children, shyness-sensitivity is not associated with negative self-perception of competence and self-worth, suggesting that perception of competence may be culture-specific (Chen et al., 2004). In Chinese culture, shy, restrained, and inhibited behavior is considered an indicator of social maturity and competence; shy and sensitive children are seen as well-behaved (Chen, 2000; Chen, Lee, & Stevenson, 1995; Chen et al., 1998).

Linguistic, conceptual, and metric equivalence must be considered in the adaptation of an instrument. Straightforward translation can be problematic because some concepts may be country-specific, such as *states* in the U.S., *provinces* in Canada and China, and *laender* in Germany. Cohen and Karsen (1999) raised concerns for adequate translations of concepts and words. Even though a measure may have evidence supporting reliability and validity in one cultural context, one cannot automatically assume the same psychometric properties in another culture without empirical support (van de Vijver & Hambleton, 1996). Thus, the instrument should have equivalent wording and content, the construct should have the same meaning, and it should assess the same psychometric features (Groth-Marnat, 2009). In addition, some cross-cultural psychologists posit that imported measures may miss some important culture-specific or *emic* constructs, creating a superficial appearance of cross-cultural homogeneity (Canino & Bravo, 1999).

Some researchers believe that psychopathological phenomena are universal but influenced by the social-cultural context in which they occur. Based on this perspective, disorders are neither entirely free of nor attributable to social or cultural shaping (Draguns, 1986; Kleinman & Good, 1985). Consistent with this perspective, importing and translating measures across cultures is acceptable if addressing similar phenomena as in the original version and culture (Helms, 1992). The advantages of adaptation and importation of measures are considerable, such as the use of accumulated psychometric evidence, and cross-cultural comparison of constituent constructs (Leung & Wong, 2003).

In 2006, China's central government reported the population with documented disabilities as 82,960,000 (6.34%), according to the 2006 *National Survey on the Status of the Disabilities* (National Bureau of Statistics, 2006). Prevalence of child psychopathology among Chinese children ranged from 3.1% to 13.0%, depending on case ascertainment, definition of diagnosis, duration, and setting (Guo, 1989; Shen, Wang, Yang, 1985; Yang et al., 2014). However, studies of well-validated standardized instruments of child psychopathology for the Chinese population are sporadic and limited. A comprehensive review of the literature on Asian child and adolescent psychopathology measures indicated that most questionnaires were imported and translated from the West (Leung & Wong, 2003).

There are a limited number of child and adolescent psychopathology measures adapted for use in China. The Child Behavior Checklist (CBCL), Teacher's Report Form (TRF), and Youth Self-Report (YSR; Achenbach, 1991a, 1991b, & 1991c) are available in Chinese, and different groups explored psychometric properties (e.g., Liu, Guo, Liu, & Sun, 1997; Yang, Soong, Chiang, & Chen, 2000; Tseng et al., 1988). The first use of the Chinese version of the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A; Butcher et al., 1992), as reported by Cheung and Ho (1997), indicated deviations on subscales possibly attributable to cultural

differences instead of higher base rates of psychopathology (Cheung, 1995). Good internal consistency ( $r_\alpha = .80-.91$  for different scales) and concurrent validity was reported for the MMPI-A (Chan, 2001). The General Health Questionnaire (GHQ) also demonstrated good internal consistency ( $r_\alpha = .88$ ) and split-half reliability ( $r = .78$ ) for scores in a Chinese sample (Shek, 1987).

Other specific measures of behavioral or emotional problems imported and modified for use in China include the Conners Parent Rating Scale (CPRS) and Conners Teacher Rating Scales (CTRS; Conners, 1969). On these measures, marginal to good interrater ( $r = .55$ ) and test-retest ( $r = .86$ ) reliability for the total scores were reported in a Chinese sample (Luk, Leung, & Lee, 1988). Adequate internal consistency ( $r_\alpha = .90$  State and  $r_\alpha = .81$  Trait) was reported with the Chinese version of the State-Trait Anxiety Inventory (STAI) in Chinese adolescents (Shek, 1988), and the five-factor model was supported (Shek, 1988, 1991a). In Chinese samples, the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was reported to have satisfactory internal consistency ( $r_\alpha = .86$ ) and split-half reliability ( $r = .77$ ; Shek, 1990) as well as convergent and discriminant validity (Shek, 1991b). A Chinese version of the Self-Rating Depression Scale (SDS; Zung, 1965) was used with Chinese adolescents to assess depressive symptoms (Liu, Ma, Kurita, & Tang, 1999), and a Chinese version of the Fear Survey Schedule for Children-Revised (FSSC-R; Ollendick, 1983) had high internal consistency ( $r_\alpha = .96$ ) and moderate 6-month stability ( $r = .67$ ; Dong, Yang, & Ollendick, 1994). The Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used with Chinese adolescents (Lee & Lee, 1996) with some items modified in translation and adaptation due to cultural differences, such as changing “cutting food into small bites” to “eating much more slowly” due to the use of chopsticks as utensils.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1987) was translated into Chinese (Lai et al., 2010) and evaluated and used in several studies in Hong Kong (Lai, Leung, Luk, & Wong, 2011, 2014; Lai et al., 2011). Du, Kou, and Coghil (2008) used the official Chinese translation of the SDQ to develop normative data for Shanghai, but questionable methods were used to assess structure (e.g., principal components analysis with varimax rotation), and results showed poor psychometric support (e.g., evident item cross-loadings and inadequate internal consistency estimates of less than .70 on all but Hyperactivity-Inattention [Parent and Teacher form] and Prosocial Behavior [Teacher form]). Yeung, Volpe, and Briesch (2020) created a Chinese translation of the Integrated Screening and Intervention System Teacher Rating (ITRF; Daniels, Volpe, Briesch, & Fabiano, 2014; Volpe & Fabiano, 2013) and assessed its psychometric properties. Although recommended EFA practices (Watkins, 2018) were used, the use of item polychoric correlations was not indicated (as is necessary with ordinal item ratings with 4 levels), so structural validity results and estimates may be inaccurate.

It is important to note that many of the imported measures summarized above were developed and validated in Hong Kong rather than mainland China. Essential differences exist between Hong Kong and mainland China culture (i.e., pure Chinese culture in mainland China versus a mixture of the East and West cultures in Hong Kong), language (i.e., Chinese Mandarin in mainland China versus Cantonese in Hong Kong), and politics (i.e., a socialist economy in mainland China versus a free market economy in Hong Kong), so the generalization of results from Hong Kong to mainland China is of concern. Hong Kong was a British colony for more than 150 years; the British legacy remains in the fabric of people’s daily living, long after the reunion with mainland China in 1997. In short, one cannot assume that Western instruments validated with

Hong Kong Chinese individuals will automatically ensure similar validity and clinical utility in mainland Chinese individuals.

A review of existing Chinese versions of general or specific child psychopathology instruments revealed that instruments measuring overall adjustment and learning behaviors in Chinese school settings have yet to be developed. Translation and adaptation of a psychometrically sound measure of child psychopathology (such as the Adjustment Scales for Children and Adolescents; McDermott, Marston, & Stott, 1993) could be of utility if determined to be psychometrically sound in the Chinese context.

**Adjustment Scales for Children and Adolescents.** The Adjustment Scales for Children and Adolescents (ASCA; McDermott et al., 1993) is a U.S. teacher-report behavior-rating instrument designed for use with noninstitutionalized youths ages 5-17 (Grades K-12). It was a major revision of the Bristol Social Adjustment Guides (BSAG; Stott, 1966; Stott, Marston, & Neill, 1975), which had British and Canadian norms. ASCA uses psychologist-preferred objective child and adolescent psychopathology definitions, and offers the advantage of unobtrusive observation. The ASCA and BSAG are unique in assessing psychopathology as teachers are not asked to provide perceived behavior frequency estimates (i.e., Never, Sometimes, Often, Very Often) or severity. Instead, teachers are asked to select the target child's typical responses or behaviors from a list of representative child behaviors in specific behavioral contexts in school environments. Psychopathology is uniquely defined by multi-situational expressions of problem behaviors that constitute specific syndromes. Another unique feature is that the ASCA is co-normed with the Differential Abilities Scale (DAS; Elliott, 1990) and the Learning Behaviors Scale (LBS; McDermott, Green, Francis, & Stott, 1999). This co-norming allows for multivariate descriptions of normal, sub-clinical, and clinical typologies, and behavioral, intellectual, academic achievement, and learning characteristics (McDermott, 1993, 1994; McDermott & Weiss, 1995), in addition to demographic and syndrome elevations, facilitating evidence-based differential classification.

Extensive psychometric evidence (including reliability, validity, and diagnostic utility) for ASCA scores is presented in the *ASCA Manual* (McDermott, 1994), in subsequently published research of the standardization sample, and in independent studies. Internal consistency estimates (Canivez, 2004, 2006a, 2006b; Canivez & Bohan, 2006; McDermott, 1993, 1994) are supportive, although the alpha coefficients are somewhat lower than those found in other teacher report behavior rating scales (Achenbach, 1991b; Achenbach & Edelbrock, 1983; Merrell, 1994; Reynolds & Kamphaus, 1992, 2004, 2015), likely due to the dichotomous nature of ASCA items that limits item and total raw score variability. Other teacher report rating scales typically have items rated on a three- or four-point ordinal scale. Short-term stability estimates (Canivez, Perry, & Weller, 2001; McDermott, 1993, 1994), and interrater agreement estimates (Canivez & Watkins, 2002; Canivez, Watkins, & Schaefer, 2002; McDermott, 1993, 1994; Schaefer, Watkins, & Canivez, 2001; Watkins & Canivez, 1997), have also supported ASCA syndrome reliability.

Convergent, divergent, and discriminant validity evidence of ASCA scores is supported (Canivez & Bordenkircher, 2002; Canivez, Neitzel, & Martin, 2005; Canivez & Rains, 2002; McDermott, 1993, 1994). The factor structure of the ASCA core syndromes with the standardization sample (McDermott, 1993, 1994) and with a large independent U.S. sample (Canivez, 2004) appears similar to the two-dimensional model of child psychopathology (conduct problem-externalizing versus withdrawal-internalizing) frequently identified in the child psychopathology assessment literature (Achenbach, 1991b; Achenbach & Edelbrock, 1983; Cicchetti & Toth, 1991; Merrell, 1994; Reynolds & Kamphaus, 1992, 2004, 2015; Quay, 1986).

ASCA factor structure was further replicated in samples of Native American youths (Canivez, 2006a, 2006b, Canivez & Bohan, 2006), Hispanic/Latino youths (Canivez & Sprouls, 2010), and Canadian youths (Canivez & Beran, 2009). McDermott, Steinberg, and Angelo (2005) extended ASCA structural validity support by creating contextually based (*situtype*) scores in the ASCA standardization sample that comport well with the three primary problem-behavior contexts in school environments (peer, teacher, and academic).

Discriminative validity and diagnostic utility of the ASCA are also reported, and the ASCA showed excellent diagnostic accuracy for emotional disability and other groups (McDermott, 1993, 1994; McDermott et al., 1995), and for ADHD (Canivez & Sprouls, 2005). Such diagnostic utility led to the use of ASCA as a criterion in a discriminative validity and diagnostic utility study for ADHD (Canivez & Gaboury, 2016).

Given the absence of psychometrically-sound general and specific child psychopathology instruments measuring overall adjustment and specific problems in mainland Chinese school settings, the ASCA was selected for translation and adaptation into Chinese Mandarin. This study also empirically assesses the adaptation's initial psychometric properties in a mainland Chinese student sample, and makes comparisons to a matched sample from the U.S. ASCA standardization.

**Translation and adaptation of ASCA into simplified Chinese Mandarin.** The official language in China is Mandarin (the spoken version, based on the Beijing dialect, is Putonghua). Because the central government requires the use of Mandarin as the common language of communication, it is used in government, media, and school instruction. In addition, many regions and localities have dialects of spoken Chinese, and it is common to speak both the local dialect and standard Mandarin. The U.S. English male and female versions of the ASCA were translated into *simplified* Mandarin. In the 1950s, the central government reformed traditional classic Chinese writing to simplified vernacular Mandarin Chinese to simplify the shapes of many commonly used characters. For example, the word *wide* is spelled as 广 in simplified Chinese, and as 廣 in traditional Chinese. Simplified Chinese is used in mainland China, while traditional Chinese is used in the Republic of China (Taiwan) and Hong Kong.

Three independent bilingual researchers and one monolingual English-speaking researcher were involved in forward and backward translation and revision. All three bilingual researchers are native Chinese with proficiency in English as a second language, and attended English-speaking U.S. or Hong Kong graduate schools. The fourth (monolingual) researcher speaks and reads English only. The translation procedures consisted of (a) forward translation, (b) backward translation (Brislin, 1970), (c) comparison of the original English ASCA to the back-translated Mandarin ASCA, (d) revision of the Mandarin ASCA, and (e) a field test (Brislin, 1970).

One bilingual researcher independently provided ASCA forward translation of general instructions, 29 specific contextual school situations, and 156 behavioral descriptions within the school contexts, from English to Chinese Mandarin. A second bilingual researcher independently provided backward translation from Chinese Mandarin to English. The third researcher, a monolingual English speaker and reader with extensive research experience with the ASCA, independently compared the back-translated to the standard ASCA version. Few contextual school situations or behavioral descriptions required modification due to near-perfect matches between the back-translated and standard ASCA forms.

Modification of perceived non-equivalent items was provided by the first bilingual researcher, followed by an independent comparison of the modified to the original ASCA by the third bilingual researcher to assess measurement of the same behaviors, contextual school situations, and behavioral descriptions in the Chinese cultural context. Finally, a field test was

conducted in which several Chinese teachers read the modified Chinese Mandarin ASCA forms to determine if questions were understandable, and this led to slight modifications of wording to produce the final version.

Several items and behaviors in the U.S. version were judged to be unusual within Chinese culture, possibly resulting in null or infrequent endorsement at low base rates. For example, Item 12 (“answers before he/she has had time to think”) might be problematic in that blurt-out behaviors are typically strictly prohibited by classroom teachers in Chinese schools, and all students are required to raise hands before asking a question or making a comment. Thus, there might be a relatively low endorsement on this item due to situational prohibition. Item 53 (“answers back aggressively, makes threats, or creates a disturbance”) may be problematic (low base rate) in that confrontation is a behavior largely discouraged by Chinese culture, and students are taught not to confront teachers. Item 126 (“Sneaks books from library”) might be problematic because a library is not guaranteed in Chinese elementary and secondary schools. Some elementary and secondary schools may not have a library due to limited resources, thus the teachers might not endorse this item because of the absence of a library. Items 138 (“Uses dangerous drugs without a doctor’s prescription”) and 139 (“Supplies dangerous drugs to other students”) may be problematic in that many medications in China are non-prescription medications, although they may require prescription in the U.S.

Additionally, Chinese parents typically have a high level of authority and control over children, and many Chinese children might not have money to buy drugs, resulting in infrequent endorsements on items 138 and 139. Item 141 (“Has brought a deadly weapon to school”) is problematic if the item is perceived to relate to guns because the Chinese central government prohibits the sale of guns to the public in Chinese society; it is very unlikely that a Chinese student could bring a gun to school. However, this item does not specify a gun as the deadly weapon, so it is unknown if respondents would consider knives or other weapons. Item 155 (“Without provocation he/she comes out with a volley of swearing”) is also potentially problematic in that swearing is very unusual behavior in Chinese classroom settings. Swearing means that a student tries to assert or promise emphatically. Assertiveness is not a desired behavior in Chinese culture because students are expected to be humble in front of their teachers, who are considered superior to students. Such items might be so rare that differential base rates or null endorsement by teachers might occur given cultural differences between China and the U.S. To examine the initial psychometric properties of this translation and adaptation of the ASCA, the Chinese Mandarin ASCA was pilot tested in a Chinese elementary school.

## Method

**Participants.** The participants included 554 students in Grades 1 through 6 at an inner-city elementary school in the city of Shantou, a middle-sized city in the southern region of mainland China. The students at the selected school were primarily from families with relatively low SES. There were approximately 90-100 students in each grade, and all students were rated by their classroom teachers. Table 1 presents the distribution of male and female students across the six grades and there were roughly equivalent numbers across sex and grade. Each of the six grade levels had three teachers who taught an average of 31 children (range from 22-38).

**Instrument.** The Adjustment Scales for Children and Adolescents (ASCA; McDermott et al., 1993) is a teacher-report behavior-rating instrument designed for use with noninstitutionalized youths aged 5-17 (Grades K-12). The ASCA consists of 156 behavioral descriptions within 29 specific school situations in which teachers may observe students’ behaviors. Of the 156 items, 97

are problem behaviors used in assessing psychopathology, and based on a factor analysis of standardization data, singularly assigned to one of six *core syndromes* (Attention-Deficit/Hyperactive [ADH], Solitary Aggressive-Provocative [SAP], Solitary Aggressive-Impulsive [SAI], Oppositional Defiant [OPD], Diffident [DIF], and Avoidant [AVO]) or two *supplementary syndromes* (Delinquent [DEL] and Lethargic/Hypoactive [LEH]). The core syndromes combine into two composite syndrome indexes: Overactivity (ADH, SAP, SAI, and OPD syndromes) and Underactivity (DIF and AVO syndromes). Twenty-six ASCA items are positive behaviors observed in more than 50% of the U.S. standardization sample.

**Table 1**  
*Chinese Student Sex Distribution Across Grades 1-6*

Grade	Sex		Total
	Female	Male	
1	49	49	98
2	44	48	92
3	43	47	90
4	45	48	93
5	47	47	94
6	44	43	87
Total	272	282	554

**Procedures.** Teacher volunteers rated students in their classroom using the ASCA and another rating scale under development over one week. The study was conducted near the end of the school year, so all of the teachers were very familiar with school behaviors of their students. Following scale completion, all rating forms were processed by the second author, and demographic and item data were entered into spreadsheets by graduate student research assistants for data analyses.

**Analyses.** Item endorsement base rates for positive behaviors (behaviors observed in  $\geq 50\%$  of the U.S. ASCA normative sample) and problem behaviors (behaviors identified in  $< 30\%$  of the U.S. ASCA normative sample) were calculated for comparison, as in McDermott (1994) and McDermott and Schaefer (1996). Differences in base rates (prevalence) between the Chinese sample ( $n = 554$ ) and an age- and grade-matched subsample ( $n = 709$ ) of the U.S. ASCA standardization were compared using proportion-difference  $z$  tests, using the Watkins (2007) *SimpleStat Tests* program, and based on the formula by Bruning and Kintz (1997). Statistical significance calculations were adjusted by a Bonferroni-corrected alpha due to multiple item comparisons.

Internal consistency estimates for the ASCA core syndromes, supplementary syndromes, and global adjustment scales were calculated using Cronbach's alpha coefficient. These estimates were provided for the Chinese and matched U.S. sample for comparison. Estimates were also separately made for male, female, Grades 1-3, and Grades 4-6. Items with null endorsements were not included in alpha estimations.

The ASCA core syndrome, supplementary syndrome, and overall adjustment scale raw scores from the Chinese sample were compared to those from the matched U.S. sample using MANOVA and ANOVA. Partial  $\eta^2$  provided effect size estimates, interpreted using Cohen's (1988) criteria (.01 is small, .09 is medium, .25 is large). Core syndrome, supplementary syndrome,

and overall adjustment scale raw score mean differences between the Chinese and U.S. samples were also interpreted using Cohen's  $d$  effect size (.20 is small, .50 is medium, .80 is large). Effect sizes below Cohen's benchmarks ( $\eta^2 < .01$ ,  $d < .20$ ) were classified as trivial.

## Results

**Behavior Frequencies.** As predicted, there were infrequent item endorsements that were thought to have potential cultural differences: Items 12 (6.3%), 53 (1.3%), 126 (0%), 138 (0%), 139 (0%), 141 (0.5%), and 155 (0%) had extremely low or null base rates, likely reflective of hypothesized cultural differences. Items with no endorsement were excluded from behavior frequency counts of rare problem behaviors.

**Positive Behaviors.** Table 2 (at end) presents 24 of 26 ASCA items reflecting positive behaviors endorsed in greater than 50% of the Chinese sample. The remaining two positive behaviors not endorsed included Item 66 ("Cautious but tries new tasks": Chinese 44.4%, U.S. 51.6%,  $ns$ ) and Item 39 ("Overly friendly with teacher": Chinese 4.9%, U.S. 67.8%,  $p < .001$ ). Given the low base rate, Item 39 might be considered a problem behavior in the Chinese cultural context, but may also simply reflect cultural norms. Of the 24 positive behaviors, 17 did not differ significantly from the matched U.S. sample base rates. Of seven statistically significant proportional differences, the Chinese sample had higher proportions on Item 131 ("Respects others' property") and Item 61 ("Works well by self").

**Rare Problem Behaviors.** Table 3 (at end) presents the 20 most-infrequently-endorsed problem behavior items in the Chinese sample (excluding four items with no teacher endorsements: 126, 138, 139, 155). SAI-syndrome Item 126 ("Sneaks books from the library"; 0.4%) and DEL-syndrome Items 138 ("Uses dangerous drugs"; 0.4%) and 139 ("Supplies dangerous drugs to others"; 0.1%) were among the rarest problem behaviors in the U.S. sample. Item 155 ("Without provocation he/she comes out with a volley of swearing") is not an item keyed to an ASCA core or supplementary syndrome, and base rates were not reported by McDermott and Schaefer (1996).

The 20 rarest problem behaviors in the Chinese sample had base rates less than or equal to 2%, and 18 of the 20 were from ASCA core syndromes associated with the global Overactivity scale. Of the 20 rarest problem behaviors, 11 (excluding the three with a null base rate: Items 126, 138, and 139) were the same as those identified by McDermott & Schaefer (1996) within the full ASCA standardization sample ( $n = 1,400$ ), and 15 did not significantly differ from those of the matched U.S. sample, while 5 items had significantly smaller proportions of endorsement in the Chinese sample. Chinese children had lower base rates on "Involved in pranks with gang" (Item 132), "Appears to live in a dream world" (Item 58), "Doesn't stay in seat" (Item 80), "Poor loser, distrusts games" (Item 95), and "Uses bad, offensive language" (Item 136). Two of the rarest problem behaviors were from the Lethargic/Hypoactive scale, while the other 18 were related to overactive, aggressive, and delinquent behaviors. Thus, most of the least common problem behaviors did not differ in teacher-endorsement proportion between the Chinese and matched U.S. samples.

**Common Problem Behaviors.** Table 3 (at end) also presents the 20 most-frequently-endorsed problem behaviors with base rates for the Chinese sample from 10.6% to 35.7%. Of the 20, 12 were identical to problem behaviors identified by McDermott & Schaefer (1996) as most common in the full U.S. standardization sample, and eight items had significantly larger proportions of endorsement in the Chinese sample. One item had a significantly lower proportion (Item 13: "Answers except when in bad mood"), and 11 items did not significantly differ in



proportion between the Chinese and the matched samples. The Attention Deficit-Hyperactive syndrome produced the greatest number of common problem behaviors (8 of 20), but equal numbers of items from the global Overactive and Underactive scales contributed to the 20 most common problem behaviors endorsed.

**Internal Consistency.** Internal consistency estimates for the Chinese sample and the matched ASCA standardization sample are presented in Table 4 (at end). Separate analyses were provided for females, males, Grades 1-3, Grades 4-6, and the total samples. Alpha coefficients were consistently lower in the Chinese sample, not unexpectedly due to the probably more-homogenous sample. Lower alpha coefficients may also result from fewer items after removing items with no endorsement.

**Syndrome Comparisons with U.S. Sample.** MANOVA and ANOVA comparisons of syndrome raw scores between Chinese and matched U.S. samples are reported in Table 5, while descriptive statistics for raw scores by group are presented in Table 6. The core syndrome raw scores MANOVA was statistically significant, Wilks  $\Lambda = .97$ ,  $F(6, 1256) = 5.99$ ,  $p < .001$ , multivariate effect size = .028, power = 1.0. ANOVA identified statistically significant group differences for ADH and DIF core syndromes; however, all core syndrome group differences had trivial effect sizes (see Table 6).

**Table 5**

*(M)ANOVA: Core, Supplemental, and Global Adjustment Scale Syndromes Raw Scores*

	<i>SS</i>	<i>SS Error</i>	<i>MS</i>	<i>MS Error</i>	<i>F</i>	<i>p</i>	$\eta^2$
<u>Core Syndrome</u>							
ADH	87.84	11,522.74	87.84	9.14	9.61	.002	.008
SAP	4.42	2,251.41	4.42	1.79	2.47	.116	.002
SAI	0.17	408.16	0.17	0.32	0.53	.469	.000
OPD	3.83	2,265.95	3.83	1.80	2.13	.144	.002
DIF	21.74	4,587.39	21.74	3.64	5.98	.015	.005
AVO	6.43	2,398.77	6.43	1.90	3.38	.066	.003
<u>Supplemental Syndrome</u>							
DEL	0.37	154.88	0.37	0.20	1.81	.178	.002
LEH	5.22	1,432.84	5.22	1.40	3.72	.054	.004
<u>Global Adjustment Scale</u>							
OVR	77.74	32,671.90	77.74	25.91	3.00	.083	.002
UNR	51.81	9,009.77	51.81	7.15	7.25	.007	.006

*Note.* ADH = Attention-Deficit Hyperactive, SAP = Solitary Aggressive (Provocative), SAI = Solitary Aggressive (Impulsive), OPD = Oppositional Defiant, DIF = Diffident, AVO = Avoidant, DEL = Delinquent, LEH = Lethargic-Hypoactive, OVR = Overactivity, UNR = Underactivity,  $\eta^2$  = partial  $\eta^2$ . Core Syndrome and Global Adjustment Scale Syndrome samples included all participants (Chinese Sample  $n = 554$ , Matched ASCA Standardization Sample  $n = 709$ ); but Delinquency (Chinese Sample  $n = 351$ , ASCA Standardization Sample  $n = 415$ ) and Lethargic-Hypoactive (Chinese Sample  $n = 415$ , ASCA Standardization Sample  $n = 609$ ) syndromes are not scored for certain subgroups (DEL not scored for females under age 12; LEH not scored for males or females above age 11) based on U.S. standardization sample.

The ANOVA for the ASCA DEL syndrome raw scores was not statistically significant,  $F(1, 764) = 1.81$ ,  $p = .178$ , partial  $\eta^2 = .002$ . The ANOVA for the ASCA LEH syndrome raw scores also was not statistically significant,  $F(1, 1022)^1 = 3.72$ ,  $p = .054$ , partial  $\eta^2 = .004$ . Table 6 illustrates the group difference trivial effect sizes.

The ASCA overall adjustment scales (OVR and UNR) raw scores MANOVA was statistically significant: Wilks  $\Lambda = .99$ ,  $F(2, 1260) = 5.39$ ,  $p < .005$ , multivariate effect size = .008, power = 0.844. Univariate ANOVA identified statistically significant group differences for the UNR scale, but like other group differences, the effect size was trivial.

Group descriptive statistics for ASCA core syndromes, supplementary syndromes, and global adjustment scales are presented in Table 6. While three comparisons were statistically significant based on univariate ANOVAs (ADH, DIF, UNR), this was due primarily to the large sample sizes. The Chinese sample did not meaningfully differ from the age- and grade- matched U.S. ASCA standardization sample on any of the ASCA syndromes, given the trivial effect sizes.

**Table 6**  
*Descriptive Statistics, F, and Effect Size Estimates*

	Chinese Sample		Matched U.S. Sample		<i>F</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<u>Core Syndrome</u>						
ADH	2.07	2.50	2.60	3.38	9.61*	.175
SAP	0.64	1.33	0.52	1.34	2.47	.090
SAI	0.17	0.56	0.15	0.58	0.53	.035
OPD	0.70	1.01	0.81	1.55	2.13	.082
DIF	1.60	1.79	1.34	2.00	5.98*	.136
AVO	0.94	1.32	0.79	1.42	3.38	.109
<u>Supplemental Syndromes</u>						
DEL	0.14	0.37	0.18	0.51	1.81	.089
LEH	0.66	1.13	0.52	1.22	3.72	.118
<u>Overall Adjustment Scales</u>						
OVR	3.58	4.30	4.08	5.63	3.00	.098
UNR	2.54	2.54	2.13	2.77	7.25*	.153

*Note.* ADH = Attention-Deficit Hyperactive, SAP = Solitary Aggressive (Provocative), SAI = Solitary Aggressive (Impulsive), OPD = Oppositional Defiant, DIF = Diffident, AVO = Avoidant, DEL = Delinquent, LEH = Lethargic-Hypoactive, OVR = Overactivity, UNR = Underactivity. Core Syndrome and Global Adjustment Scale Syndrome samples included all participants (Chinese Sample  $n = 554$ , ASCA Standardization Sample  $n = 709$ ); but Delinquency (Chinese Sample  $n = 351$ , ASCA Standardization Sample  $n = 415$ ) and Lethargic-Hypoactive (Chinese Sample  $n = 415$ , ASCA Standardization Sample  $n = 609$ ) syndromes are not scored for certain subgroups (DEL not scored for females under age 12; LEH not scored for males or females above age 11) based on U.S. standardization sample.

\* $p < .05$ .

## Discussion

Instruments translated and adapted into Chinese are often validated in Hong Kong, rather than mainland China, where significant cultural differences exist. Instruments validated in Hong Kong also utilize traditional Chinese rather than simplified Chinese Mandarin. Chinese versions of general and specific child psychopathology instruments measuring overall adjustment and learning behaviors in school settings appear to be absent. Translation and adaptation of the ASCA (McDermott et al., 1993) and initial psychometric evaluations for use in the mainland Chinese context was presented in this study.

Using back-translation methods (Brislin, 1970), the ASCA was translated and adapted into simplified Chinese Mandarin. While most items appeared to have relevance to the Chinese context,

seven items produced very low (Items 12 and 53) or null (Items 126, 138, 139, 141, and 155) base rates in the sample of children in the Shantou city school where data were collected. These items involved children blurting out answers or answering aggressively in response to teachers, drug or weapon use, and unprovoked verbal aggression. Given the single school in a single city in China, similar results may not generalize in a broader, more heterogeneous sample, but item content appears to reflect behaviors antithetical to Chinese culture and likely to be extremely rare.

Positive behaviors reflected by ASCA items were remarkably similar between the ratings of Chinese students to those in the matched U.S. ASCA standardization sample, with 17 of the 26 showing no significant differences in base rates. Only two items (Items 66 and 39) were not endorsed in greater than 50% of the Chinese sample, and only one (Item 39: “Overly friendly with teacher”) was significantly lower than in the U.S. ASCA standardization sample and reflected cultural norm differences. Overall, it appears that behaviors reflected in ASCA item content created to measure positive behaviors, and observed as such in the U.S. standardization sample, were also similarly observed in the present Chinese sample, supporting cross-cultural similarity.

The rarest problem behaviors (with lowest base rate) identified in the ASCA standardization sample (McDermott & Schaefer, 1996) were similarly observed to be the rarest problem behaviors among the Chinese student sample. The four ASCA items with null base rates in the Chinese sample were also extremely rare among the U.S. ASCA standardization sample, with base rates of less than .5% (McDermott & Schaefer, 1996). All 20 of the rarest problem behaviors in the Chinese sample had base rates less than or equal to 2%, and 18 of the 20 were from ASCA core syndromes associated with the Overactivity scale. Remarkable similarities were observed between the present Chinese sample and the matched U.S. ASCA standardization sample, and base rates for 15 of the 20 did not significantly differ from those from the matched U.S. ASCA standardization sample. Like positive behaviors, it appears there are substantial similarities in rare problem behaviors across the two cultures.

Among the 20 most common problem behaviors noted in the present Chinese sample, base rates ranged from 10.6% to 35.7%, and 12 of the 20 were identical to common problem behaviors reported by McDermott and Schaefer (1996). Somewhat greater variability in common problem behaviors was observed in the Chinese sample, with eight behaviors showing higher base rates than the matched U.S. ASCA standardization sample, and one showing a significantly lower base rate. However, 11 of the 20 did not evidence significant differences in base rates among the Chinese and matched U.S. ASCA standardization samples. The ADH syndrome contained the greatest number of common problem behaviors in the Chinese sample (8 of 20), illustrating the commonality of overactive and impulsive behaviors. Thus, like positive and rare problem behaviors, common problem behaviors were similar between the Chinese and U.S. ASCA standardization samples, indicating cross-cultural similarities.

Scale level raw score comparisons (core syndromes, supplemental syndromes, global adjustment scales) between the Chinese and matched U.S. ASCA standardization sample showed remarkable similarities in mean raw score totals among the ASCA core syndromes, supplemental syndromes, and global adjustment scales. The statistically significant group differences on the ADH and DIF core syndromes and the UNR global adjustment scale resulted from large sample sizes, but all effect sizes reflected trivial differences that were of no practical significance. These results also suggest the cross-cultural similarity of measurement of core and supplemental syndromes, as well as global adjustment scales, with the ASCA.

**Limitations.** As with all studies, there are a variety of limitations that qualify results. The first limitation relates to the restricted sample from one school in one geographic region and city

in China, limiting generalization beyond this sample. Thus, there is a need for additional samples of Chinese students from other geographic locations as well as greater diversity regarding rural and urban and higher and lower socioeconomic status. Another limitation is the grade range in the present sample (Grades 1-6); information regarding middle school (Grades 7-9) and high school (Grades 10-12) students is absent. Future studies need to extend the present study by examining students at these higher educational levels.

Another limitation relates to the sample size, which, while adequate for present analyses, is inadequate for item-level exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) to test the latent factor structure beginning with the items as measured variables or indicators. Supplemental data collection to add to the present results may increase the sample size to a level that would allow for such important analyses. Knowing how well the latent ASCA factors are quantified within a Chinese sample would determine the viability of that structure's scoring (AERA, APA, NCME, 2014).

While syndrome (core, supplementary, global scale) mean score group comparisons showed no meaningful differences in raw scores, such comparisons do not adequately discern item-level bias detectable by differential item functioning (DIF), which should be the topic of further examination (French & Finch, 2016). It would be useful to examine DIF across variables of sex and grade level to determine equivalence that would allow for comparisons across such variables. Differences in base rates of positive behaviors, common problem behaviors, and rare problem behaviors identified in the present study may or may not reflect measurement bias, so assessment of this would be helpful.

**Conclusion.** Results of the present study show a viable translation and adaptation of the ASCA into simplified Chinese Mandarin that would allow for research applications and future clinical use. Remarkable similarities were observed in the present sample of Chinese students compared to the matched U.S. ASCA standardization sample in terms of base rates of positive behaviors, rare problem behaviors, and common problem behaviors. This suggests some similarities across the two cultures and potential utility for the assessment of child psychopathology. Further, no meaningful differences were observed between the Chinese sample and the matched U.S. ASCA standardization sample on ASCA core syndromes, supplemental syndromes, or global adjustment scales, further supporting the cross-cultural similarity of measured child psychopathology.

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### **Conflict of Interest**

Paul A. McDermott is author of Adjustment Scales for Children and Adolescents and holds copyright for all translated versions.

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## Additional Tables

**Table 2**

*Precedence and Prevalence of Positive Behaviors on the Adjustment Scales for Children and Adolescents Among Chinese Students (n = 554)*

Item Number/Positive Behavior	Situation	Chinese Sample Precedence Rank	Chinese Sample Prevalence (%)	U.S. Prevalence <sup>1</sup> (%)
142. Attendance good except for illness	School attendance	1	93.7	95.1
131. Respects others' property	Respecting others' property	2	91.2*	83.1
92. Accepts rules	Playing fairly	3	85.0	83.5
84. Keeps and cares for school materials	Caring for books, etc.	4	80.3	79.7
89. Joins in team games	Playing fairly	5	79.2	78.1
104. Gets along with two or more companions	Companions	6	78.5	79.4
61. Works well by self	Working by self in class	7	77.6*	64.9
97. Engages in sensible unorganized play	Informal unorganized play	8	74.2	67.8
110. Is a good mixer with agemates	Getting along with others	9	72.4	69.1
1. Greets teacher as most children do	Greeting the teacher	10	73.1	70.9
119. Stands up for self when necessary	Standing one's own ground	11	72.0	77.2
121. Behaves well standing in line	Behaving in line	12	71.5	77.2
23. Talks freely with teacher	Talking with teacher	13	71.1	74.6
54. Generally listens well (schoolwork)	Attending to schoolwork	14	68.8	68.8
70. Sticks to it working with hands	Work with hands (shop, art)	15	67.5	72.5
51. Accepts correction without fuss	Reaction to correction	16	64.6*	73.3
8. Willing or eager to help teacher	Helping teacher with jobs	18	63.5	64.7
37. Friendly, smiles readily with teacher	General manner with teacher	18	63.5	65.9
47. Generally is not untruthful	Telling the truth	18	63.5*	78.1
18. Asks for teacher's help when needed	Seeking/accepting teacher's help	20	63.4*	72.5
32. Likes teacher's praise	Valuing teacher's attention	21	59.7*	68.7
41. Well-behaved in classroom	Behaving in classroom	22	59.6*	70.7
81. Sits in sensible, alert position	Sitting at desk	23	59.2	62.1
14. Answers questions if able	Answering questions	24	56.5*	73.9

*Note.* Of the 26 positive ASCA behaviors identified in the U.S. standardization sample, only two were not endorsed for  $\geq 50\%$  of the Chinese sample: Item 66 (Cautious but tries new tasks): Chinese (44.4%), U.S. (51.6%) *n.s.*; Item 39 (Overly friendly with teacher): Chinese (4.9%), U.S. (67.8%)  $p < .0001$ .

<sup>1</sup>National prevalence estimates obtained from the ASCA standardization sample ages 6-13 and grades 1-6 ( $n = 709$ ) to match Chinese sample demographic features; ASCA standardization sample data provided by Dr. Paul McDermott.

\* $p < .05$  (Bonferroni corrected  $\alpha = .0025$ ).

**Table 3**

*Precedence and Prevalence of 20 Rarest and 20 Most Common Problem Behaviors on the Adjustment Scales for Children and Adolescents Among Chinese Students (n = 554)*

Item Number/Problem Behavior	Situation	Surface Syndrome	Chinese Sample Precedence Rank	Chinese Sample Prevalence (%)	U.S. Prevalence <sup>1</sup> (%)
<b><i>Rarest Problems</i></b>					
134. Is a leader in illicit activities <sup>†</sup>	Obeying laws/rules outside school	DEL	1	0.2	0.8
132. Involved in pranks with gang	Obeying laws/rules outside school	DEL	2	0.4*	4.7
133. Has damaged property <sup>†</sup>	Obeying laws/rules outside school	DEL	3	0.4	0.4
6. Responds with angry look or turns away <sup>†</sup>	Greeting the teacher	OPD	4	0.5	0.0
141. Brought deadly weapon to school <sup>†</sup>	Obeying laws/rules in school	DEL	5	0.5	0.3
129. Steals from other pupils <sup>†</sup>	Respecting other's property	SAP	6	0.7	1.6
137. Makes sexually offensive gestures, remarks <sup>†</sup>	Obeying laws/rules in school	SAI	7	0.7	0.6
140. Regularly takes alcoholic beverages <sup>†</sup>	Obeying laws/rules in school	DEL	8	0.7	0.0
127. Snatches other's objects	Respecting other's property	SAI	9	0.9	2.7
153. Without warning, throws objects across room <sup>†</sup>	Containing sudden outbursts	SAP	10	1.3	0.8
53. Answers aggressively, threatens, creates disturbances	Reaction to correction	OPD	11	1.3	1.7
148. Constantly involuntary movements <sup>†</sup>	Nervous habits	SAI	12	1.4	1.0
58. Appears to live in a dream world	Attending to schoolwork	LEH	13	1.6*	6.3
75. Has ruined their work purposely <sup>†</sup>	Work with hands (shop, art)	SAP	14	1.6	1.8
80. Doesn't stay in seat	Sitting at desk	ADH	15	1.6*	12.6
95. Poor loser, disrupts games	Playing fairly	OPD	16	1.6*	8.9
136. Uses bad, offensive language	Obeying laws/rules outside school	SAI	17	1.6	1.6
33. Sometimes seeks disapproval	Valuing teacher's attention	OPD	18	2.0*	6.2
36. Has dejected look	General manner with teacher	LEH	19	2.0	3.8
154. Rushes about shouting madly <sup>†</sup>	Containing sudden outbursts	SAI	20	2.0	0.4

**Table 3 continued**

Item Number/Problem Behavior	Situation	Surface Syndrome	Chinese Sample Precedence Rank	Chinese Sample Prevalence (%)	U.S. Prevalence <sup>1</sup> (%)
<b>Common Problems</b>					
29. Wants your interest but holds back <sup>†</sup>	Valuing teacher's attention	DIF	1	35.7*	20.9
50. Improves for moment, doesn't last <sup>†</sup>	Reaction to correction	ADH	2	30.9*	17.3
42. Misbehaves when teacher attends to others <sup>†</sup>	Behaving in classroom	ADH	3	23.5	22.6
15. Freezes up, doesn't answer	Answering questions	DIF	4	22.0*	6.5
55. Talks, gazes around, plays with things <sup>†</sup>	Attending to schoolwork	ADH	5	19.3	20.6
5. Welcomes you loudly	Greeting the teacher	ADH	6	18.8*	7.2
82. Constantly restless, moving, rapping <sup>†</sup>	Sitting at desk	ADH	7	17.9	13.8
16. Not shy but rarely offers answer <sup>†</sup>	Answering questions	AVO	8	16.2	12.1
78. Sits lifelessly most of time	Sitting at desk	AVO	9	16.1*	9.3
30. Uses various devices to gain teacher attention <sup>†</sup>	Valuing teacher's attention	ADH	10	15.0	16.1
116. Does not stand up for self	Standing one's own ground	DIF	11	14.8*	7.1
85. Loses or forgets books, materials, etc. <sup>†</sup>	Caring for books, etc.	ADH	12	13.9	17.5
98. Rather loud but not disruptive <sup>†</sup>	Informal unorganized play	ADH	13	13.0	14.5
56. So quiet don't know if attending <sup>†</sup>	Attending to schoolwork	DIF	14	12.3	10.0
93. Plays only for self	Playing fairly	SAP	15	11.6*	4.8
38. Shy but not unfriendly <sup>†</sup>	General manner with teacher	DIF	16	11.2*	22.7
87. Needs encouragement to join in <sup>†</sup>	Taking part in team games	DIF	17	11.0	14.7
67. Won't attempt tasks	Coping with new learning	LEH	18	10.8	7.2
34. Distant, makes no relationship	General manner with teacher	AVO	19	10.6	6.3
13. Answers except when in bad mood	Answering questions	OPD	20	10.6*	4.2

*Note.* Four of the 97 ASCA problem behavior items had no teacher endorsements for any of the Chinese students ( $n = 554$ ) who had complete ASCA data and are not included in this table. One item (126) was from the Solitary Aggressive-Impulsive syndrome and three items (135, 138, 139) were from the Delinquent syndrome. All four of these behaviors are among the rarest 20 behaviors from the total ASCA standardization sample (McDermott & Schaefer, 1996).

ADH = Attention Deficit Hyperactive, SAP = Solitary Aggressive (Provocative), SAI = Solitary Aggressive (Impulsive), OPD = Oppositional Defiant, DIF = Diffident, AVO = Avoidant, DEL = Delinquent, LEH = Lethargic (Hypoactive).

<sup>1</sup>National prevalence estimates obtained from the ASCA standardization sample ages 6-13 and grades 1-6 ( $n = 709$ ) to match Chinese sample demographic features; ASCA standardization sample data provided by Dr. Paul McDermott.

<sup>†</sup>Items matching the rarest and most common problem behaviors from the ASCA standardization sample ( $n = 1,400$ ) (McDermott & Schaefer, 1996).

\* $p < .05$  (Bonferroni correction  $\alpha = .0025$  for rare problem behaviors,  $\alpha = .0025$  for common problem behaviors).



**Table 4**

*Internal Consistency Estimates (Alpha) for ASCA Core Syndromes and Overall Adjustment Scales for the Chinese Sample (n = 554) and Age and Grade Matched ASCA U.S. Standardization Sample (n = 709)*

ASCA Syndrome/Scale	Chinese Sample					Matched U.S. ASCA Standardization Sample				
	Female <i>n</i> = 272	Male <i>n</i> = 282	Grades 1-3 <i>n</i> = 280	Grades 4-6 <i>n</i> = 274	Total <i>n</i> = 554	Female <i>n</i> = 346	Male <i>n</i> = 363	Grades 1-3 <i>n</i> = 344	Grades 4-6 <i>n</i> = 365	Total <i>n</i> = 709
<u>Core Syndrome</u>										
ADH	.76	.75	.74	.78	.76	.86	.84	.85	.86	.85
SAP	.52 <sup>a</sup>	.74	.60 <sup>b</sup>	.75	.72	.78	.79	.83	.73	.79
SAI	.41 <sup>cd</sup>	.57 <sup>c</sup>	.23 <sup>ce</sup>	.61 <sup>c</sup>	.53 <sup>c</sup>	.75	.57	.70	.57 <sup>c</sup>	.64
OPD	.31 <sup>f</sup>	.45	.35	.42 <sup>f</sup>	.41	.73 <sup>f</sup>	.78	.75 <sup>f</sup>	.77 <sup>f</sup>	.76 <sup>f</sup>
DIF	.61	.66	.60	.67	.63	.79	.76	.79	.76	.78
AVO	.56	.58	.52	.64	.58	.60	.75	.70	.73	.72
<u>Global Adjustment Scale</u>										
OVR	.81 <sup>acdf</sup>	.85 <sup>c</sup>	.81 <sup>bce</sup>	.87 <sup>cf</sup>	.85 <sup>c</sup>	.91 <sup>f</sup>	.90 <sup>f</sup>	.91 <sup>c</sup>	.90 <sup>cf</sup>	.91 <sup>f</sup>
UNR	.70	.69	.66	.73	.70	.78	.80	.81	.77	.79

*Note.* ASCA = Adjustment Scales for Children and Adolescents, ADH = Attention-Deficit Hyperactive, SAP = Solitary Aggressive (Provocative), SAI = Solitary Aggressive (Impulsive), OPD = Oppositional Defiant, DIF = Diffident, AVO = Avoidant, OVR = Overactivity, UNR = Underactivity.

<sup>a</sup>Item 75 not included due to no endorsement. <sup>b</sup>Item 129 not included due to no endorsement. <sup>c</sup>Item 126 not included due to no endorsement. <sup>d</sup>Item 127 not included due to no endorsement. <sup>e</sup>Item 136 not included due to no endorsement. <sup>f</sup>Item 6 not included due to no endorsement