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## Gender and cultural differences in school motivation

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### ABSTRACT

The purpose of this research was to explore gender differences and cultural differences in school motivation among students from eight culturally diverse groups from Western and non-Western societies. The selected groups come from Hong Kong, the Philippines, Singapore, Australia, the Netherlands, and Qatar. More than 10,000 secondary school students reported their mastery, performance, social, and extrinsic motivation. Results showed (very) small to moderately large gender differences, which were largely in line with prior research in Western societies. Moreover, significant differences in school motivation across the eight cultural groups were found, however, only the Qatari sample strongly deviated from the other samples. In all cultural groups, females had slightly higher scores on mastery motivation and social motivation (except for Qatari students), and in several Western and non-Western samples, males had slightly higher scores on performance motivation. Gender differences in extrinsic motivation were less straightforward.

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## 1. Introduction

### 1.1 Cultural differences in school motivation

From Western research, it is well known that there are a number of significant differences between genders on the nature and effects of different forms of school motivation and achievement. Western research suggests that females are somewhat more socially oriented in learning contexts (e.g. Hijzen, Boekaerts, and Vedder 2006; Korpershoek, Kuyper, and van der Werf 2014), while males are somewhat more competitively oriented (e.g. Hibbard and Buhrmester 2010; Van Vugt, De Cremer, and Janssen 2007). This is also manifested in their general orientation toward learning (Huang 2012; Hulleman et al. 2010). However, an important issue still to be

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investigated is whether these patterns are replicable across a wider range of cultural groups which include non-Western participants.

Zusho and Clayton (2011) stress that there is a need to extend our understanding of how cultural factors relate more generally to basic motivational processes, because commonly, White middleclass Anglo-American students represent the classic sample for motivation research (see also King and McInerney 2014; Zusho and Pintrich 2003). However, the meaning of motivational constructs might have a different connotation in Eastern and Western cultures. Watkins (2000), for example, claims that the validity of a number of basic Western notions regarding the nature of motivation and learning are questionable in Chinese societies. The idea that memorisation as a learning strategy does not involve understanding is found inconsistent with Chinese students' and teachers' beliefs about learning (see also Dahlin and Watkins 2000; Purdie and Hattie 2002). Dekker and Fischer (2008) reported that, in collectivist cultures (e.g. in Asian societies), performance goals are more salient, whereas in individualist cultures (e.g. in Western societies), mastery goals are more salient.<sup>1</sup> In highly competitive educational systems, being performance-oriented may be more adaptive (at least on the short-term) than being mastery-oriented (see also King, McInerney, and Watkins 2012; King and McInerney 2014). That is, endorsing performance goals (e.g. outperforming others) has been positively related to academic achievement, mastery goals, and group participation in Chinese societies (Chan and Lai 2006; Lau and Lee 2008; Lau, Liem, and Nie 2008). Additionally, King et al. (2012) found that, in Hong Kong, competitiveness, instead of leading to maladaptive behaviour, was a positive predictor of mastery goals in educational settings. In collectivist societies, students generally believe that competition leads to self-improvement, whereas in individualist societies, competitiveness is often seen as a negative trait (Fulop 1999; Watkins 2007).

In the present study, Personal Investment Theory (PIT) (Maehr 1984; Urdan and Maehr 1995) is used as theoretical framework to elaborate on different forms of school motivation among individuals in Western and non-Western societies. Maehrs' ideas on personal goals are particularly suitable for any analysis of motivation in cross-cultural settings (see King and McInerney 2012, 2014). In Eastern samples, the salience of social (solidarity) goals and extrinsic goals in achievement settings may be at least as important as the oft-studied mastery and performance goals in, for example, achievement goal theory (Elliot and McGregor 2001). The theory of personal investment uses a more elaborative framework, including both social solidarity goals and extrinsic goals alongside mastery (or task) and performance (or ego) goals (see also King, Ganotice, and Watkins 2014; King, McInerney, and Watkins 2013).

Social goals refer to the social-grounded reasons for studying, resulting from social affiliation and social concern (King and McInerney 2012). In collectivist societies, interdependent self-construal (focused on the collective) instead of independent self-construal (focused on the individual) is more salient (King and McInerney 2012; Kitayama et al. 1997). Striving towards social goals can direct students' learning behaviour, for example, when students try to achieve well for the sake of the group (Covington 2000; Tao and Hong 2014). Eastern cultures such as China more strongly value the collective (Brickman and Miller 2001; Oyserman, Coon, and Kimmelmeier 2002). Individual achievement and achievement motives are interdependent (mutually reliant) on the achievement and achievement motives of one's social others (e.g. Chang

and Wong 2008; Chang, Wong, & Teo, 2000; Markus and Kitayama 1991). Research conducted in Australia reveals that Aboriginal students were more influenced by social goals in school settings than were Anglo and immigrant Australian students (McInerney et al. 1998). These studies endorse the importance of including social goals when studying school motivation among Eastern samples. However, in contrast, the study of Li (2006) suggests that the collectivistic orientation Chinese people usually display in family relationships does not transfer to the school setting in which Chinese students are more individualistic oriented. Niles (1998) also found remarkable similarities between people's achievement goals in individualist (Anglo-Australian) and collectivist (Sri Lankan) cultures. This result has repeatedly been found in cross-cultural studies in recent years (e.g. Grouzet et al. 2005; McInerney and Ali 2006; McInerney et al. 1998). McInerney (2012) therefore states that, even if significant differences across cultures are found in motivational profiles, these are generally a matter of degree rather than kind.

PIT also includes extrinsic goals. Extrinsic goals refer to one's desire for external rewards such as praise (Maehr 1984). External rewards are incentives to continue one's work or task (Ryan and Deci 2000). Despite the fact that praising and giving students rewards (e.g. school grades) for their schoolwork and their learning efforts is common in everyday classroom practices, external motivation among students is generally seen as a negative trait. In highly competitive societies such as China, rewards such as high grades open up students' possibilities for further education. Therefore, we thought it important to include extrinsic goals in the cross-cultural comparisons as well.

## **1.2 Gender differences in school motivation**

In addition to exploring differences in school motivation among Western and non-Western samples, the present study investigates gender differences in school motivation among the cultural groups. Most studies on this topic (focusing on achievement goals) have been conducted in Western societies, which have yielded mixed results. In a Dutch study (Korpershoek, Kuyper, and van der Werf 2014), females were found to be more socially motivated, whereas males were more motivated to outperform others. No gender differences were found for mastery and extrinsic motivation. Hijzen, Boekaerts, and Vedder (2006) reported that Dutch males had a stronger preference for superiority goals (i.e. performance goals) than Dutch females, and that females preferred mastery and social goals. Cross and Madson (1997) emphasize that in Western societies, females generally have a more salient relational self than males, which might explain their preference for social goals and values (an interdependent self-construal as opposed to an independent self-construal). Similar to the Dutch findings, Anderman and Midgley (1997) found that, in the U.S., males were somewhat more performance oriented, whereas females were more mastery oriented in some domains (see also Roeser, Midgley, and Urdan 1996). Studies on competitiveness in the U.S. and the U.K. show that males were more competitive than females (Hibbard and Buhrmester 2010; Van Vugt, De Cremer, and Janssen 2007). In a Norwegian study, Skaalvik and Skaalvik (2004) investigated gender differences in goal orientations regarding learning language and mathematics among Norwegian youth and found that males had higher ego orientation (performance motivation) than females, albeit only

regarding learning mathematics. Finally, Patrick, Ryan, and Pintrich (1999) studied the relation between students' mastery and extrinsic goal orientations and self-regulated learning in the U.S. and found that males were generally more extrinsically motivated than females. No gender differences were found for mastery in their study. Other studies have identified no, or only small, gender differences in motivation (e.g., Steinmayr and Spinath 2008). To what extent these results hold among non-Western samples is unknown. Hence, the present study not only explores differences in school motivation among different cultural groups, but also investigates gender differences in motivation among those groups.

### 1.3 The present study

The present study compares males' and females' school motivation across eight culturally diverse student groups, each representing a unique cultural group. The aim was to find out whether the gender differences in motivation commonly found in Western samples (e.g. males reporting higher levels of performance motivation than females), also hold in non-Western samples, and to explore differences in school motivation among different cultural groups. The eight cultural groups included are Chinese students from Hong Kong (non-Western), Chinese and Malay students from Singapore (non-Western), Filipino students from the Philippines (non-Western), indigenous Aboriginal students from Australia (non-Western), Anglo-Australian students from Australia (Western), Western students from the Netherlands (Western), and Middle-Eastern Qatari students from Qatar (non-Western). This cross-cultural comparison provides comprehensive insights into the dynamics of gender and cultural differences in school motivation.

The measurement framework of McInerney and Ali (2006), which is based on PIT, was used to measure students' school motivation. Using one single measurement instrument, the Inventory of School Motivation (ISM) based upon PIT across the samples, the present study sheds light on the robustness of previously found gender differences in school motivation across culturally very different samples. The research questions were:

- (1) *To what extent do students from eight different cultural groups in secondary school endorse master, performance, social and extrinsic goals?*
- (2) *Are there significant differences in mean level endorsement of mastery, performance, social and extrinsic goals across the eight different cultural groups?*
- (3) *Are there significant differences in mean level endorsement of mastery, performance, social and extrinsic goals across gender across the eight different cultural groups?*

Prior to conducting the analyses, we examined whether the components of the measurement model were invariant across the gender groups and across cultural groups from different societies, using multi-group confirmatory factor analyses. These tests were necessary to demonstrate that the ISM measures students' school motivation in the same way across all samples.

Student samples were collected from pre-existing data sets from Western and non-Western societies that largely vary in their cultural characteristics and that had contributed to a range of studies using the Inventory of School Motivation (see [Appendix A](#) for an overview). Because each selected society holds different combinations of characteristics (though not exhaustive), this broad focus enhances our understanding of the potential impact of different cultural contexts on students' school motivation. Eight distinct cultural groups from six different societies were included in the study, covering more than ten thousand secondary school students. This exceptional dataset is the result of international collaboration of scholars that put their previously collected data at our disposal to conduct this study, generating the opportunity for the desired large-scale cross-cultural comparisons.

The present study is exploratory and descriptive in nature. Stating hypotheses about students based on the general characteristics of the societies they live in is an oversimplified approach and may run the strong risk of stereotyping cultural groups (see also [Hau and Ho 2008](#)). Furthermore, there are many confounding factors that may have an impact on gender differences in a society in addition to general characteristics, such as politics, national prosperity, socioeconomic status, et cetera. The impact of these factors on individuals could differ from person to person and from group to group; cultural groups are not necessarily homogeneous with similar characteristics. We operationalized culture primarily in terms of nation-of-origin. We believe that it is reasonable to assume at least some congruence in the minds of people that live and learn in more or less the same cultural context. We will return to this issue in the discussion section.

## 2. Method

### 2.1 Participants and procedures

As mentioned, the data were drawn from a number of discrete studies using the ISM to measure secondary school students' school motivation. All studies were conducted in regular secondary education classrooms. A short description of all datasets is included below. For a more elaborated description we refer to the following studies: Singapore ([Liem et al. 2013](#)), Hong Kong ([King, McInerney, and Watkins 2012](#)), The Philippines ([Ganotice, Bernardo, and King 2012](#)), Australia ([McInerney 2012](#); [McInerney et al. 2012](#)), The Netherlands ([Zijsling et al. 2009](#)), and Qatar ([Nasser and McInerney 2014](#)).

[Table 1](#) gives an overview of the included samples ( $N_{total} = 11,657$ ). Students were selected when they had filled in all ISM items and when their gender and age were known. Students

**Table 1.** Overview of the samples.

	Society	Sample size	Average age	Grade level	% Males
Chinese	Singapore	3335	14.2 (1.3)	7 <sup>th</sup> – 9 <sup>th</sup>	52.5
Malays	Singapore	900	14.2 (1.3)	7 <sup>th</sup> – 9 <sup>th</sup>	55.6
Chinese	Hong Kong	670	13.5 (1.3)	7 <sup>th</sup> and 9 <sup>th</sup>	50.6
Filipino	The Philippines	1494	14.5 (0.9)	9 <sup>th</sup>	45.0
Indigenous Aboriginal Australians	Australia	423	13.8 (1.5)	7 <sup>th</sup> – 12 <sup>th</sup>	45.4
Anglo-Australians	Australia	265	13.5 (1.1)	7 <sup>th</sup> – 12 <sup>th</sup>	55.5
Western Dutch	The Netherlands	3686	15.9 (0.5)	9 <sup>th</sup>	46.7
Middle-Eastern Qatari	Qatar	884	13.7 (1.5)	7 <sup>th</sup> – 9 <sup>th</sup>	46.5



that had indicated double cultural backgrounds (e.g. Chinese and Malay Singaporeans) were excluded to enable group comparisons.

The samples significantly differed as regards students' gender,  $\chi^2(7) = 57.99, p < .001$ , with the Singapore sample of non-Western Malays and the Anglo-Australians including somewhat more males and the Filipino, Indigenous Aboriginals, Dutch and Qatari samples including somewhat more females as compared to the other samples.

*Singapore.* An English survey was administered to more than 4,000 secondary school students from 136 classes in nine schools in Singapore (Liem et al. 2013). Most participants were Chinese students (about 2/3) or Malay students (about 1/5), others were Indian, Eurasian, Filipino, or Japanese or had other cultural backgrounds. The sample was representative of the overall student population in Singapore regarding cultural background (Singapore Department of Statistics 2010). We included two cultural groups, namely the Chinese and Malay students.

*Hong Kong.* The Hong Kong students were from three different schools (one high-ability school, one medium-ability school, and one low ability school; King, McInerney, and Watkins 2012). A convenience sampling method was used. All students were Hong Kong Chinese. The ISM was administered in Chinese (see King and Watkins 2013).

*Philippines.* Data for the Filipino sample were collected from four different schools in the Philippines (convenience sample). Students came from both public and private schools. All students included were Filipino. The ISM was administered to the students in Filipino (see Ganotice, Bernardo, and King 2012).

*Australia.* Data were collected from 13 high schools across Northern Territory in Australia as part of a longitudinal study of Indigenous motivation (McInerney 2012; McInerney et al. 2012). More than 1,000 participants contributed to the study, among which 66% Aboriginals and 30% non-Indigenous (Anglo-Australian) students, and small groups of Torres Strait Islanders and students with mixed cultural backgrounds. Most of the Anglo-Australian students were drawn from four high schools in remote areas. We included the Indigenous Aboriginal Australians and Anglo-Australians. The ISM was administered in English, which was a second language for most of the Indigenous students. Questions were read aloud to maximise understanding and completion rates.

*The Netherlands.* The data used were collected in Dutch as part of a large-scale longitudinal study in the Netherlands (Zijsling et al. 2009), which is fairly representative of the overall student population. For this project, 9<sup>th</sup> grade students from 81 different public schools were selected. Native Dutch students were selected (i.e. both parents born in the Netherlands).

*Qatar.* A convenience sample of four preparatory schools and one secondary school (middle schools; grades 7, 8, and 9) in Doha Qatar was used. The schools are so-called 'independent schools'. As part of recent educational reforms, public schools were transformed into independent schools where they conform to new curriculum standards and teaching methods. All schools in Qatar are sex segregated. Two schools were for boys and three were for girls. All students at each school in grades 7 to 9 participated by completing the survey instrument in Arabic (see Nasser and McInerney 2014).



## 2.2 The measure of school motivation

The original Inventory of School Motivation (ISM; McInerney and Ali 2006) consists of 43 motivation items, which were used in Hong Kong, the Philippines, and Qatar. The developers also derived a subset of 32 items from the original ISM that could be used when a shorter questionnaire was desired. This shorter version was used in the Netherlands, Australia, and Singapore. The factor structure of the original questionnaire was kept in this shorter version of the ISM. The items from this shorter version of the ISM were used here for comparison across countries. Paper-and-pencil questionnaires were administered at the schools. The 32 items represent the four motivation dimensions. Each dimension is based on two subscales, each measured with 3 to 5 items, using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Mastery motivation was based on *task* (e.g. ‘I like to see that I am improving in my schoolwork’) and *effort* (e.g. ‘When I am improving in my schoolwork I try even harder’), performance motivation on *competition* (e.g. ‘I work harder if I’m trying to be better than others’) and *social power* (e.g. ‘I often try to be the leader of a group’), social motivation on *social concern* (e.g. ‘It is very important for students to help each other at school’) and *affiliation* (e.g. ‘I prefer to work with other people at school rather than alone’), and extrinsic motivation on *praise* (e.g. ‘At school I work best when I am praised’) and *token* (e.g. ‘I work hard in class for rewards from the teacher’).

Table 2 shows that the internal consistency of the four motivation scales within each cultural group was moderately high to (very) high. The ISM has been validated in many countries since its original introduction, emphasizing its ability to capture the existence of multiple goal orientations among students across different cultures (Ganotice 2010; Ganotice, Bernardo, and King 2012; King et al., 2012; King and Watkins 2013; McInerney and Ali 2006; McInerney and Sinclair 1991, 1992; McInerney et al. 1997; McInerney, Dowson, and Yeung 2005; McInerney, Marsh, and Yeung 2003; Zijlsling et al. 2009).

## 2.3 Analyses

Confirmatory factor analyses were conducted with Mplus (version 7.3; Muthén and Muthén 1998–2017). CFAs for categorical data were used to examine the construct validity of the ISM for each cultural group and for both gender groups. After preliminary analyses of the baseline model, the response categories 1 and 2 of the 5-point Likert scale were collapsed due the fact that, in some samples, none or only a few students had scored the lowest category on several items.

**Table 2.** Cronbach’s alpha’s of the motivation scales in each cultural group.

	Mastery	Performance	Social	Extrinsic
Chinese (Singapore)	.82	.75	.79	.84
Malays (Singapore)	.80	.69	.75	.83
Chinese (Hong Kong)	.71	.73	.73	.82
Filipino (The Philippines)	.95	.95	.83	.94
Indigenous Aboriginal Australians (Australia)	.79	.84	.73	.86
Anglo-Australians (Australia)	.81	.75	.70	.79
Dutch (The Netherlands)	.77	.85	.73	.86
Qatari (Qatar)	.83	.82	.80	.79

Multigroup CFAs were conducted to test the invariance of the ISM across the cultural groups, across both gender groups and across gender within each cultural group. WLSMV estimation was used in all analyses; Muthén & Muthén, 1998–2017). Several goodness-of-fit indices were used to determine the model fit, including: chi-square statistic, root mean square error of approximation (RMSEA), Tucker-Lewis index (TLI), and comparative fit index (CFI). For large sample sizes, the chi-square statistic is almost always significant; therefore, other fit indices were used to evaluate the overall model fit. RMSEA values less than .06 indicate acceptable fit in combination with TLI and CFI values higher than .95 (Hu and Bentler 1999).

Measurement invariance tests were conducted to demonstrate whether the ISM measured students' school motivation with the same structure across different groups (Van de Schoot, Lugtig, and Hox 2012). First, a baseline model was developed (no equality constraints imposed; configural model). Correlations among item error variances were allowed within the first order factors (e.g. among the items measuring the first order factor *task*) to improve the model fit to the data. Thereafter, a second model was tested in which the factor loadings were constrained to be equal across both gender groups (metric model), and a third model in which the factor loadings and intercepts were constrained to be equal across both gender groups (scalar model). This was done on the overall student sample and within each cultural group.

Getting strong evidence of measurement invariance is difficult when testing complex models across a wide range of cultural groups given the model complexity and cultural differences in response styles (Smith 2004). Aiming for full measurement invariance may be 'too strict and unrealistic' (Milfont and Fischer 2010, 117). To interpret the measurement invariance tests, the change in CFI values were compared across the configural, metric, and scalar models. A decrease of less than .01 in the CFI could be taken as evidence of invariance. Cheung and Rensvold (2002) argued that from an applied perspective, the chi-square difference test may be overly restrictive; therefore, the change in CFI values was used when comparing the models with increasing constraints.

Descriptive statistics were conducted with SPSS version 23 (IBM Corporation).

## Results

### 3.1 Validity of the ISM across the samples

The CFA for the total sample with all the cultural groups included had a good fit regarding all goodness-of-fit indices. This overall model fits the data well, with a RMSEA of .05 and TLI and CFI values of .97. This means that the four-factor structure of mastery, performance, social, and extrinsic motivation was confirmed. Subsequently, separate CFAs were conducted for each of the eight cultural groups examined, to evaluate whether the four-factor structure also fitted the data for each cultural group separately (Table 3).

In the eight cultural groups, the RMSEAs were below or equal to the cut-off value of .06. Regarding the TLI and CFI values we can see some variation across the groups. The values varied from .86 to .99, indicating that for some cultural groups, particularly the Chinese students from Hong Kong, the model fit was not optimal. This means that

**Table 3.** Goodness of fit indices for each of the cultural groups and for the total sample.

Model	$\chi^2$	df	p	RMSEA	TLI	CFI
Chinese (Singapore) (N = 3,335)	6533.55	449	<.001	.06 (.06-.06)	.89	.90
Malays (Singapore) (N = 900)	1776.21	449	<.001	.06 (.06-.06)	.90	.91
Chinese (Hong Kong) (N = 670)	1647.52	449	<.001	.06 (.06-.07)	.86	.87
Filipino (The Philippines) (N = 1,494)	1586.58	449	<.001	.04 (.04-.04)	.99	.99
Indigenous Aboriginal Australians (Australia) (N = 423)	861.20	449	<.001	.05 (.04-.05)	.95	.95
Anglo-Australians (Australia) (N = 265)	800.24	449	<.001	.05 (.05-.06)	.89	.90
Dutch (The Netherlands) (N = 3,686)	4345.64	449	<.001	.05 (.05-.05)	.93	.94
Qatar (Qatari) (N = 900)	1650.42	449	<.001	.06 (.05-.06)	.94	.94
Total Sample (N = 11,657)	13,262.50	449	<.001	.05 (.05-.05)	.97	.97

Note:  $\chi^2$  = chi-square; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index; CFI = comparative fit index.

**Table 4.** Invariance tests across gender and cultural group using the total sample.

Model	$\chi^2$	df	p	RMSEA	TLI	CFI
Cultural groups (N = 11,657):						
Configural model	17,924.40	3592	<.001	.05 (.05-.05)	.95	.95
Metric model	21,585.91	3788	<.001	.06 (.06-.06)	.94	.94
Scalar model	30,889.92	4208	<.001	.07 (.07-.07)	.91	.91
Gender groups (N = 11,657):						
Configural model	13,768.93	898	<.001	.05 (.05-.05)	.97	.97
Metric model	13,688.95	926	<.001	.05 (.05-.05)	.97	.97
Scalar model	13,792.88	986	<.001	.05 (.05-.05)	.97	.97

Note:  $\chi^2$  = chi-square; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index; CFI = comparative fit index.

among these cultural groups, the four-factor model did not fit the data well. We will get back to this topic in the discussion. To evaluate statistically whether the basic four-factor structure held across all cultural groups, invariance of the responses to the ISM in each cultural group was examined (Table 4). Model fit for the configural model across cultural groups was acceptable (RMSEA = .05; TLI and CFI = .95). The model fit indicators of the metric model almost met the cut-off values (RMSEA = .06; TLI and CFI = .94). Based on the small change in CFI, the ISM demonstrated metric invariance across cultures (though not optimal), but not scalar invariance.<sup>2</sup> This means that the factor loadings were largely equal across cultures, but that the intercepts differed across cultures. Comparing mean level differences in motivation across cultures, using this four-factor model, is therefore not meaningful. The invariance of the responses to the ISM across gender (see also Table 4) showed scalar invariance<sup>3</sup> (RMSEA = .05; TLI and CFI = .97), indicating that the ISM responses were invariant across the gender groups. This finding supports comparison of mean level differences in motivation across the gender groups.

The gender invariance of the responses to the ISM was also examined within each of the eight cultural groups (see Appendix B), to evaluate whether mean level differences in motivation across the gender groups can be meaningfully interpreted within each cultural group. The results are in line with the overall models for each cultural group. Acceptable fit and scalar invariance was found for the Filipino sample and the Indigenous Aboriginal Australians, and the models for the Dutch and Qatari samples almost met the cut-off values. For these samples, the ISM seems invariant across the gender groups. For the two Chinese samples (Singapore and Hong Kong), the Malay

sample (Singapore), and the Anglo-Australians (Australia), model fit indices for the baseline models need some improvement (see Table 3), which implies that interpreting measurement invariance test and comparing mean level differences in motivation across the gender groups within these samples is not meaningful.

Taken together, metric invariance across the eight cultural groups allows for cross-cultural comparisons, with the caveat that the results for the Chinese, Malay and Anglo-Australian samples need to be interpreted with caution. Therefore, we will present a non-statistical comparison of the endorsement of the scales across the cultural groups and evaluate overall trends in the data.

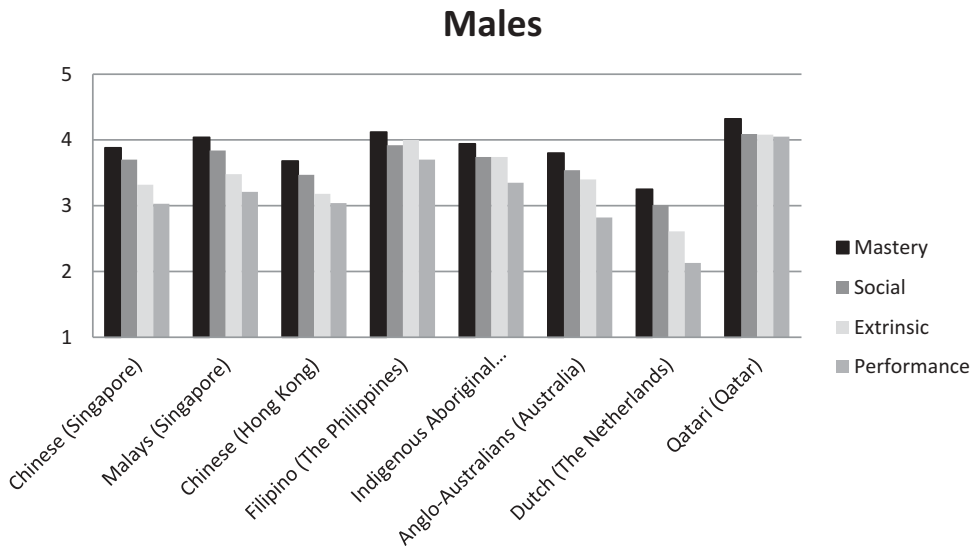
### 3.2 Endorsement of ISM scales

First, it was examined to what extent students from eight different cultural groups in secondary school endorse master, performance, social and extrinsic goals. Our results

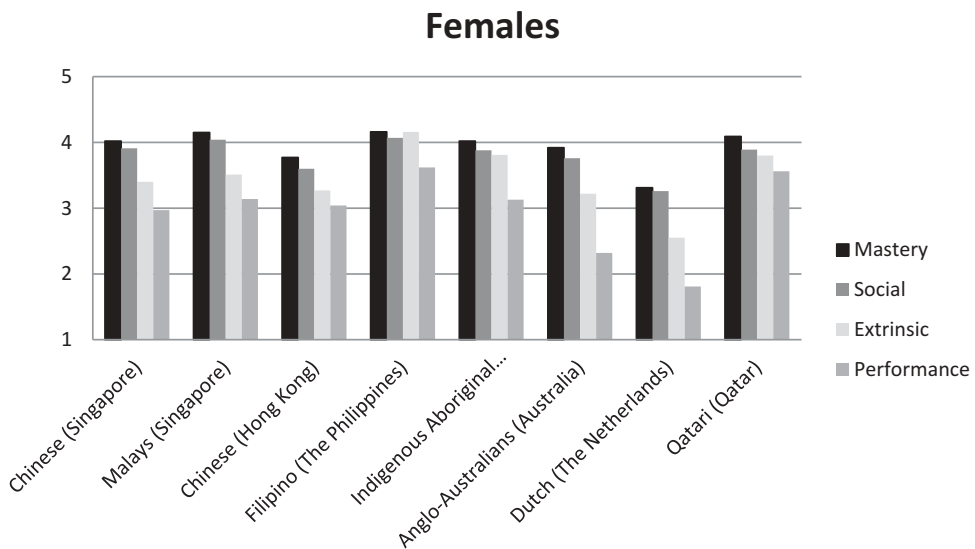
**Table 5.** Students' average scores on the four motivation scales, separately for males, females, and the overall student samples within each cultural group.

	Total	Males	Females	Gender difference <sup>a</sup>	Effect Size <sup>b</sup>
Mastery motivation:					
Chinese (Singapore)	3.95	3.88	4.02	-0.14	<b>0.25</b>
Malays (Singapore)	4.09	4.04	4.15	-0.11	<b>0.22</b>
Chinese (Hong Kong)	3.73	3.68	3.77	-0.09	<b>0.20</b>
Filipino (The Philippines)	4.14	4.12	4.16	-0.04	0.04
Indigenous Aboriginal Australians (Australia)	3.98	3.94	4.02	-0.08	0.13
Anglo-Australians (Australia)	3.85	3.80	3.92	-0.12	<b>0.20</b>
Dutch (The Netherlands)	3.28	3.25	3.31	-0.06	0.10
Qatari (Qatar)	4.20	4.32	4.09	0.23	<b>0.38</b>
Performance motivation:					
Chinese (Singapore)	3.00	3.03	2.97	0.06	0.09
Malays (Singapore)	3.18	3.21	3.14	0.07	0.11
Chinese (Hong Kong)	3.04	3.04	3.04	0.00	0.00
Filipino (The Philippines)	3.65	3.70	3.62	0.08	0.07
Indigenous Aboriginal Australians (Australia)	3.23	3.35	3.13	0.22	<b>0.24</b>
Anglo-Australians (Australia)	2.59	2.82	2.32	0.50	<b>0.74</b>
Dutch (The Netherlands)	1.96	2.13	1.81	0.32	<b>0.43</b>
Qatari (Qatar)	3.79	4.05	3.56	0.49	<b>0.63</b>
Social motivation:					
Chinese (Singapore)	3.80	3.70	3.91	-0.21	<b>0.35</b>
Malays (Singapore)	3.93	3.84	4.04	-0.20	<b>0.34</b>
Chinese (Hong Kong)	3.53	3.47	3.60	-0.13	<b>0.27</b>
Filipino (The Philippines)	4.00	3.92	4.07	-0.15	<b>0.23</b>
Indigenous Aboriginal Australians (Australia)	3.81	3.74	3.88	-0.14	<b>0.22</b>
Anglo-Australians (Australia)	3.64	3.54	3.76	-0.22	<b>0.38</b>
Dutch (The Netherlands)	3.14	3.01	3.26	-0.25	<b>0.42</b>
Qatari (Qatar)	3.98	4.09	3.89	0.20	<b>0.31</b>
Extrinsic motivation:					
Chinese (Singapore)	3.36	3.32	3.40	-0.08	0.10
Malays (Singapore)	3.50	3.48	3.51	-0.03	0.04
Chinese (Hong Kong)	3.22	3.18	3.27	-0.09	0.14
Filipino (The Philippines)	4.09	4.00	4.16	-0.16	0.17
Indigenous Aboriginal Australians (Australia)	3.78	3.74	3.81	-0.07	0.08
Anglo-Australians (Australia)	3.32	3.40	3.22	0.18	<b>0.25</b>
Dutch (The Netherlands)	2.58	2.61	2.55	0.06	0.08
Qatari (Qatar)	3.93	4.08	3.80	0.28	<b>0.42</b>

Notes. <sup>a</sup> Mean males' minus mean females' scores. <sup>b</sup> Effect sizes > .20 are printed in bold.



**Figure 1.** Average mean scores for males on all motivation dimensions.



**Figure 2.** Average mean scores for females on all motivation dimensions.

revealed a highly consistent pattern across cultural groups regarding the endorsement of the scales. With few exceptions, and in line with previous studies, mastery was the most highly endorsed goal, followed by social, extrinsic and, finally, performance goals (Table 5). Despite the fact that scalar invariance could not be established across the cultural groups, and therefore tests of mean differences were not conducted, there evolved a highly consistent pattern in the salience of the four motivation dimensions (see also Figures 1 and 2). Two exceptions were that among the Filipino students the social and extrinsic motivation scales were reversed, and that among Indigenous

Aboriginal Australians males the scores on social and extrinsic motivation were equal. Nevertheless, there seems to be a similar trend in the salience of the four motivation dimensions across all cultural groups.

### 3.3 Differences in motivation across gender and cultural groups

Table 5 also shows students' average scores on mastery, performance, social, and extrinsic motivation, separately for males and females from the eight cultural groups. We acknowledge that the goodness of fit indices were less than ideal in some cases, but given the scope and complexity of the sample we decided to present the results for all samples. Mean gender differences (males' minus females' scores) and effect sizes (Cohen's  $d$ ) are reported (effect sizes  $> .20$  are printed in bold) for ease of interpretation.

On the whole, the gender differences in school motivation within each sample were (very) small to moderately large, that is, the effect sizes varied from 0.00 to 0.74. Among all cultural groups except Qatari students, females had (on average) higher scores on mastery motivation than males. Effect sizes  $\geq 0.20$  were found for Chinese and Malay students (Singapore), Chinese students (Hong Kong) and Anglo-Australian students (Australia). Among the Qatari sample, the males had higher scores than the females on this scale (Cohen's  $d = 0.38$ ). In fact, the Qatari males' scores on all four scales were higher than the Qatari females' scores (effect sizes varying from 0.31 to 0.63). Among both Australian groups, the Dutch, and the Qatari students, the males had higher scores on performance motivation than the females (effect sizes  $\geq 0.20$ ). Effect sizes were, however, much smaller in the Asian samples. For social motivation, all effect sizes were larger than 0.20. Females (on average) had higher scores on this scale than males among all cultural groups, except for Qatari students, as was the case for mastery. Finally, for the extrinsic motivation scale, among the Anglo-Australian and Qatari students, males' average score was higher than females' score (effect sizes  $\geq 0.20$ ). Gender differences in extrinsic motivation were much smaller among the other cultural groups and generally pointed in the other direction, thus females scoring slightly higher on this scale (except for the Dutch students). The latter effects were, however, very small.

## 4. Conclusions and discussion

### 4.1 Discussion of the findings

The first research question asked to what extent do students from eight different cultural groups in secondary school endorse master, performance, social and extrinsic goals. Our results revealed a highly consistent pattern across cultural groups regarding the endorsement of the scales. This is in line with McInerney (2012) that differences across cultures are generally a matter of degree rather than kind. Mastery was, on average (average endorsement 3.9), the most salient motivation dimension among the students across the eight groups. There is abundant international research indicating the benefits of students holding mastery goals (Coutinho and Neuman 2008; Elliot and Murayama 2008; Gonida, Voulala, and Kiosseoglou 2009; McInerney 2008; Pajares, Britner, and Valiante 2000). That mastery is highly endorsed by students across diverse cultures, as indicated in this

study, reveals the essential role mastery should play in engaging students in effective learning (Gonida, Voulala, and Kiosseoglou 2009; McInerney and Ali 2006; Meece, Anderman, and Anderman 2006). The fact that students also strongly endorsed the social motivation items (only marginally weaker than mastery goals, average social motivation across the eight groups, 3.7) emphasizes that students strongly endorse social concern and social affiliation in educational settings, regardless of the type of society in which they live. Both Western and non-Western groups appear to value the social aspects of learning in the same way (e.g. Grouzet et al. 2005; McInerney et al. 1998; Niles 1998; Li 2006). The importance of group learning and peer and social support for learning seem to be endorsed in most societies nowadays (see also Dowson, McInerney, and Nelson 2006; Meece, Anderman, and Anderman 2006). The strong endorsement of social goals across the cultural groups highlights the anomaly that social goals are still relatively marginalized in the education research literature on motivation, although increasing international research is examining the role of social goals in engaged learning (King 2017; King, McInerney, and Watkins 2013; King, Ganotice, and Watkins 2014; King and McInerney 2012; Liem 2016).

The relatively low endorsement of performance motivation across all cultural groups (except Qatari males) supports the belief of many educators that performance orientation is a less salient motivator (with an average endorsement level of 3.05, if Qatari is excluded 2.95). A style of motivation based on competition which underlies much teaching and assessment practice, is apparently dis-endorsed by the students themselves, at least in these self-report data. This is a paradox to be investigated through further research. Alternatively, the low endorsement of performance motivation (competition and power) may reflect a self-serving bias that students do not want to admit to being performance oriented (that is competitive and social-power seeking). If this is the case then this is also an interesting cross-cultural phenomenon that appears to be relatively consistent across a wide variety of cultural groups.

Finally, the average endorsement of extrinsic motivation across the groups was moderate at 3.5. The relatively higher endorsement of extrinsic motivation across the Filipino (4.09) and Indigenous Australian (3.78) groups suggests that something inherent in the cultural socialisation practices of these societies (and, for example, the endorsement of achievement goals in schools) may explain why learning for rewards and praise is more common. In the Philippines, qualitative studies have revealed that Filipino students see schooling as a pathway to better career prospects and upward social mobility (Church and Katigbak 1992). Socialization practices emphasize the importance of academic success so that students can financially support their families after graduation (Bernardo, Salanga, and Aguas 2008). These cultural factors may account for the salience of extrinsic motivation among Filipino samples. Similar processes may be at work in Indigenous Australian cultures.

Our second research question asked whether there were statistically significant differences in mean level endorsement of mastery, performance, social and extrinsic goals across the eight different cultural groups. As the CFA analyses did not demonstrate scalar equivalence across the cultural groups it was considered inappropriate to conduct statistical analyses across the eight groups on the four motivation dimensions. Our third research question asked whether there were statistically significant differences in mean level endorsement of mastery, performance, social and extrinsic goals across



gender across the eight different cultural groups. The ISM measurements used in this study were generally invariant across gender within each cultural group. Overall, the gender differences we found within cultural groups were (very) small to moderately large, and generally in line with prior research conducted in Western societies. Namely, mastery and social goals appear more salient to females, while performance and extrinsic goals appear more salient to males, with a few minor exceptions. Given the vastly different socialisation processes that occur across these diverse cultural groups, the strong similarities in patterns across groups is to be noted as potentially a universal effect. However, it is also possible that because the surveys were conducted within a school context, the responses may represent school socialisation effects more than cultural effects per se. This issue could be followed up with further research using a modification of the ISM so that it is generalised to ‘out of school’ activities such as social and sporting activities. An exception to this pattern of similarities was provided by Qatar. Qatar was the only society included that showed strong cultural-specific gender differences. The combination of cultural characteristics (e.g. collectivistic and Islamic society) and sex-segregated schools seem to be reflected in males’ and females’ school motivation. A possible reason for why Qatari students were very different from the other samples may be the limited opportunities for females in creating careers for themselves after school. While new educational opportunities have opened up for Qatari women, they only earn 69% of men’s wages and are more than twice as likely to be unemployed compared to men (World Economic Forum 2013). Qatar ranked 111<sup>th</sup> out of 146 countries in terms of the gender inequality index, and is ranked 111<sup>th</sup> out of 135 in the Global Gender Gap Index (World Economic Forum 2013). The limited job opportunities for Qatari women may have decreased their school motivation, thus accounting for why Qatari male students scored higher across all the motivation dimensions measured in this study. As a simpler explanation, however, it is also possible that there is a strong response bias among Qatari boys to answer at the extremes of the scales used. In all cases their average response was  $>4$ .

#### **4.2 Limitations of the study**

There are a number of limitations to consider when interpreting the findings of our study. Firstly, the model fit for the Anglo-Australian sample (Australia) and the Chinese sample (Hong Kong) was unsatisfactory. In contrast with the Chinese students from Singapore, the Chinese students from Hong Kong filled out the questionnaire in Chinese language. The translation of the items from English to Chinese might have resulted in small differences in nuance in some of the items. Regarding the Anglo-Australian sample, it remains unclear why the fit indices were unsatisfactory, which is why these results need to be replicated in other Anglo-Australian samples for validation. The Anglo-Australians in the sample were drawn from the very remote areas. Teachers in these areas believe that these students differ from other Anglo-Australians from the same areas whose parents sent them to boarding schools. The families remaining behind seem less academically oriented than those who sent their children to boarding schools. Therefore, the sample may not cover the entire range of school motivation due to this selective sample. Notwithstanding the need for replication, we

note here that applying strict cut-off values rather than rules of thumb may have been too restrictive (for a discussion on this topic, see Marsh, Hau, and Wen 2004).

Secondly, as stated by Hau and Ho (2008), simple dichotomies such as East-West are far from adequate in describing cultural variations in the world. Mixtures of different cultures are present within each society, complicating the opportunity of conducting 'clean' cross-cultural comparisons. By focusing on specific cultural groups within societies rather than societies as a whole, and by elaborating on the cultural characteristics of each sample (see Appendix A), we tried to bring about a valid comparison to answer our research questions. While we used nation-of-origin as a proxy for culture, we did ensure to the extent it was possible, that the national groups considered were homogeneous, for example, all the Qatari students were Arabic Qatari, all the Indigenous Australians were Aboriginal, and all the Anglo-Australians were from Anglo background.

Thirdly, the data were drawn from a number of discrete studies that were conducted on different occasions and under different circumstances (e.g. sampling procedures; school inclusion criteria) and with different sample sizes, which may have impacted upon the results. Moreover, although the societal characteristics in which the students grow up and go to school differ to a large extent, all the students in the primary samples attended regular secondary education classrooms. In all included societies, attending secondary education is, in principle, mandatory, resulting in participating student samples that are expected to be fairly representative of the specific cultural groups in each society. We do acknowledge that the samples differed to some extent with regard to students' socioeconomic backgrounds, which is important to keep in mind while interpreting the findings. As a more general note, day-to-day classroom practices and curricula may vary largely across the different societies, but education in those societies evidently shares important characteristics, such as taking classes in mandatory school subjects (mother tongue and foreign language lessons, mathematics and science lessons, history and geography, et cetera), teacher-centred (in some societies in combination with student-centred) approaches to learning, and regular performance tests per school subject to assess student performance. Cross-cultural comparisons in this commonly shared educational context provides, in our view, valuable information about gender differences in school motivation within and across those societies. Notwithstanding the societal differences and different sampling methods used in the primary studies, the broad similarities and consistencies in the gender differences across the various groups are striking.

#### **4.3 Suggestions for further research and educational practice**

In addition to the stated need to replicate the findings, it would be useful to include other relevant student characteristics in future studies. Some studies conducted in Western societies found gender differences in motivation only among particular ability groups, for example, only among low-ability students (Meece and Jones 1996; males reported a stronger mastery orientation than did females). Furthermore, gender differences in self-perceptions (e.g. self-efficacy beliefs) may influence the ways that males and females perceive their learning environment and, consequently, they may adjust their goal orientations accordingly. For example, Anderman and Midgley (1997) found that males perceived their classroom as more performance oriented than females did.

Some studies have found positive associations between self-efficacy beliefs and goal adoption, such as mastery goals (Greene et al. 2004), but it is unclear how gender, self-efficacy beliefs, and achievement goals are interrelated. Studying gender differences in motivation in accordance with gender differences in self-efficacy beliefs across various cultural groups could produce useful insights regarding these issues.

With regard to educational practice, our research demonstrates that, in addition to the essential acknowledgement of students' cultural backgrounds for purposes of making learning relevant and embedded (culturally relevant teaching), at the end of the day, generic teaching techniques emphasizing mastery learning approaches, set within a positive and socially supportive learning environment (e.g. Lau and Nie 2008; Urdan and Schoenfelder 2006; Rolland 2012), are most likely to be successful in all classrooms internationally and should form the basis of international best practice. The lesser endorsement of extrinsic and performance orientations across all groups included in this study suggests that classrooms as far afield as China, Australia, Qatar, and the Netherlands should de-emphasize extrinsic rewards and performance based systems, not because they do not provide some incentive for students to engage in learning, but rather because there are other approaches and incentives that are potentially more powerful, such as mastery and social, that will lead to more engaged learning.

## Notes

1. Students pursuing mastery goals attempt to understand the topic at hand, gain knowledge, and improve their skills, whereas performance-oriented students are particularly focussed on demonstrating their ability (Elliot and McGregor 2001; Maehr 1984; McInerney et al. 1997; Tapola and Niemivirta 2008).
2. Model comparisons for cultural groups were as follows: Metric versus configural model:  $\chi^2(196) = 3541.49, p < .001$ . Scalar versus metric model:  $\chi^2(420) = 11,727.18, p < .001$ .
3. Model comparisons for gender groups were as follows: Metric versus configural model:  $\chi^2(28) = 240.85, p < .001$ . Scalar versus metric model:  $\chi^2(60) = 600.07, p < .001$ .

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## References

- Anderman, E. M., and C. Midgley. 1997. "Changes in Achievement Goal Orientations, Perceived Academic Competence, and Grades across the Transition to Middle Level Schools." *Contemporary Educational Psychology* 22: 269–298. doi:10.1006/ceps.1996.0926.
- Australian Bureau of Statistics. 2011. *Census of Population and Housing*. Australia: Bureau of Statistics.
- Bernardo, A. B. I., G. C. Salanga, and K. M. Aguas. 2008. "Filipino Adolescent Students' Conceptions of Learning Goals." In *What the West Can Learn from the East: Asian Perspectives on the Psychology of Learning and Motivation*, edited by O. Tan, D. M. McInerney, A. D. Liem, and A. G. Tan, 169–190. Charlotte, NC: Information Age Publishing.
- Brickman, S. J., and R. B. Miller. 2001. "The Impact of Sociocultural Context on Future Goals and Self-Regulation." In *Research on Sociocultural Influences on Motivation and Learning*, edited by D. M. McInerney and S. Van Etten, 119–138. Greenwich: Information Age Publishing.
- Chan, K. W., and P. Y. Lai. 2006. "Revisiting the Trichotomous Achievement Goal Framework for Hong Kong Secondary Students: A Structural Model Analysis." *The Asia-Pacific Education Researcher* 16: 11–22. doi:10.3860/taper.v16i1.88.
- Chang, W., W. Wong, and G. Teo. 2000. "The Socially Oriented and Individually Oriented Achievement Motivation of Singaporean and Chinese Students." *Journal of Psychology in Chinese Societies* 1: 39–63.
- Chang, W. C., and K. Wong. 2008. "Socially Oriented Achievement Goals of Chinese University Students in Singapore: Structure and Relationships with Achievement Motives, Goals and Affective Outcomes." *International Journal of Psychology* 2008: 880–885. doi:10.1080/00207590701836398.
- Cheung, G. W., and R. B. Rensvold. 2002. "Evaluating Goodness-Of-Fit Indexes for Testing Measurement Invariance." *Structural Equation Modeling* 9: 233–255. doi:10.1207/s15328007sem0902\_5.
- Church, A. T., and M. S. Katigbak. 1992. "The Cultural Context of Academic Motives: A Comparison of American and Filipino College Students." *Journal of Cross-Cultural Psychology* 23: 40–58. doi:10.1177/0022022192231003.
- Coutinho, S. A., and G. Neuman. 2008. "A Model of Metacognition, Achievement Goal Orientation, Learning Style and Self-Efficacy." *Learning Environments Research* 11: 131–151. doi:10.1007/s10984-008-9042-7.
- Covington, M. V. 2000. "Goal Theory, Motivation, and School Achievement: An Integrative Review." *Annual Review of Psychology* 51: 171–200. doi:10.1146/annurev.psych.51.1.171.

- Cross, S. E., and L. Madson. 1997. "Models of the Self: Self-Construals and Gender." *Psychological Bulletin* 122: 5–37. doi:10.1037/0033-2909.122.1.5.
- Dahlin, B., and D. Watkins. 2000. "The Role of Repetition in the Processes of Memorising and Understanding: A Comparison of the Views of German and Chinese Secondary School Students in Hong Kong." *The British Journal of Educational Psychology* 70: 65–84. doi:10.1348/000709900157976.
- Dekker, S., and R. Fischer. 2008. "Cultural Differences in Academic Motivation Goals: A Meta-Analysis across 13 Societies." *Journal of Educational Research* 102: 99–110. doi:10.3200/joer.102.2.99-110.
- Dowson, M., D. M. McInerney, and G. F. Nelson. 2006. "An Investigation of the Effects of School Context and Sex Differences on Students' Motivational Goal Orientations." *Educational Psychology* 26: 781–811. doi:10.1080/01443410600941920.
- Elliot, A. J., and H. A. McGregor. 2001. "A 2 × 2 Achievement Goal Framework." *Journal of Personality and Social Psychology* 80: 501–519. doi:10.1037//0022-3514.80.3.501.
- Elliot, A. J., and K. Murayama. 2008. "On the Measurement of Achievement Goals: Critique, Illustration, and Application." *The Journal of Educational Psychology* 100: 613–828. doi:10.1037/0022-0663.100.3.613.
- Fulop, M. 1999. "Students' Perception of the Role of Competition in Their Respective Countries: Hungary, Japan, USA." In *Young Citizens in Europe*, edited by A. Ross, 195–219. London: University of North London Press.
- Ganotice, F. A. 2010. "A Confirmatory Factor Analysis of Scores on Inventory of School Motivation (ISM), Sense of Self Scale, and Facilitating Conditions Questionnaire (FCQ): A Study Using A Philippine Sample." *The Educational Measurement and Evaluation Review* 1: 59–77.
- Ganotice, F. A., A. B. I. Bernardo, and R. B. King. 2012. "Testing the Factorial Invariance of the English and Filipino Versions of the Inventory of School Motivation with Bilingual Students in the Philippines." *Journal of Psychoeducational Assessment* 30: 298–303. doi:10.1177/0734282911435459.
- Gonida, E. N., K. Voulala, and G. Kiosseoglou. 2009. "Students' Achievement Goal Orientations and Their Behavioral and Emotional Engagement: Co-Examining the Role of Perceived School Goal Structures and Parent Goals during Adolescence." *Learning and Individual Differences* 19: 53–60. doi:10.1016/j.lindif.2008.04.002.
- Greene, B. A., R. B. Miller, H. M. Crowson, B. L. Duke, and K. L. Akey. 2004. "Predicting High School Students' Cognitive Engagement and Achievement: Contributions of Classroom Perceptions and Motivation." *Contemporary Educational Psychology* 29: 462–482. doi:10.1016/j.cedpsych.2004.01.006.
- Grouzet, F. M., T. Kasser, A. Ahuvia, J. M. F. Dols, Y. Kim, S. Lau, R. M. Ryan, S. Saunders, P. Schmuck, and K. M. Sheldon. 2005. "The Structure of Goals across 15 Cultures." *Journal of Personality and Social Psychology* 89: 800–816. doi:10.1037/0022-3514.89.5.800.
- Hau, K.-T., and I. T. Ho. 2008. "Editorial: Insights from Research on Asian Students' Achievement Motivation." *International Journal of Psychology* 43: 865–869. doi:10.1080/00207590701838030.
- Hibbard, D. R., and D. Buhrmester. 2010. "Competitiveness, Gender, and Adjustment among Adolescents." *Sex Roles* 63: 412–424. doi:10.1007/s11199-010-9809-z.
- Hijzen, D., M. Boekaerts, and P. Vedder. 2006. "The Relationship between the Quality of Cooperative Learning, Students' Goal Preferences, and Perceptions of Contextual Factors in the Classroom." *Scandinavian Journal of Psychology* 47: 9–21. doi:10.1111/j.1467-9450.2006.00488.x.
- Hong Kong Government. 2010. *Hong Kong Statistics*. Hong Kong: Census and Statistics Department, Hong Kong Government.
- Hu, L., and P. M. Bentler. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives." *Structural Equation Modeling* 6: 1–55. doi:10.1080/10705519909540118.

- Huang, C. 2012. "Discriminant and Criterion-Related Validity of Achievement Goals in Predicting Academic Achievement: A Meta-Analysis." *The Journal of Educational Psychology* 104: 48–74. doi:10.1037/a0026223.
- Hulleman, C. S., S. M. Schrager, S. M. Bodmann, and J. M. Harackiewicz. 2010. "A Meta-Analytic Review of Achievement Goal Measures: Different Labels for the Same Constructs or Different Constructs with Similar Labels?" *Psychological Bulletin* 136: 422–449. doi:10.1037/a0018947.
- King, R. B. 2017. "Social Goals and Well-Being." *Journal of Experimental Education* 85: 107–125. doi:10.1080/00220973.2015.1111853.
- King, R. B., and D. A. Watkins. 2013. "Validating the Chinese Version of the Inventory of School Motivation." *International Journal of Testing* 13: 175–192. doi:10.1080/15305058.2012.656162.
- King, R. B., and D. M. McInerney. 2012. "Including Social Goals in Achievement Motivation Research: Examples from the Philippines." *Online Readings in Psychology and Culture, Unit 5*. Retrieved from <http://scholarworks.gvsu.edu/orpc/vol5/iss3/4>
- King, R. B., and D. M. McInerney. 2014. "Culture's Consequences on Student Motivation: Capturing Cross-Cultural Universality and Variability through Personal Investment Theory." *Educational Psychologist* 49: 175–198. doi:10.1080/00461520.2014.926813.
- King, R. B., D. M. McInerney, and D. A. Watkins. 2012. "Competitiveness Is Not that Bad ... at Least in the East: Testing the Hierarchical Model of Achievement Motivation in the Asian Setting." *International Journal of Intercultural Relations* 36: 446–457. doi:10.1016/j.ijintrel.2011.10.003.
- King, R. B., D. M. McInerney, and D. A. Watkins. 2013. "Examining the Role of Social Goals in School: A Study in Two Collectivist Cultures." *European Journal of Psychology of Education* 28: 1505–1523. doi:10.1007/s10212-013-0179-0.
- King, R. B., F. A. Ganotice, and D. A. Watkins. 2014. "A Cross-Cultural Analysis of Achievement and Social Goals among Chinese and Filipino Students." *Social Psychology of Education* 17: 439–455. doi:10.1007/s11218-014-9251-0.
- Kitayama, S., H. R. Markus, H. Matsumoto, and V. Norasakkunkit. 1997. "Individual and Collective Processes in the Construction of the Self: Self-Enhancement in the United States and Self-Criticism in Japan." *Journal of Personality and Social Psychology* 72: 1245–1267. doi:10.1037/0022-3514.72.6.1245.
- Korpershoek, H., H. Kuyper, and M. P. C. van der Werf. 2014. "Differences in Students' School Motivation: A Latent Class Modelling Approach." *Social Psychology of Education* 18: 137–163. doi:10.1007/s11218-014-9274-6.
- Lau, A. D., A. D. Liem, and Y. Nie. 2008. "Task and Self-Related Pathways to Deep Learning: The Mediating Role of Achievement Goals, Classroom Attentiveness, and Group Participation." *British Journal of Educational Psychology* 78: 639–662. doi:10.1348/000709907x270261.
- Lau, K.-T., and J. Lee. 2008. "Examining Hong Kong Students' Achievement Goals and Their Relations with Students' Perceived Classroom Environment and Strategy Use." *Educational Psychology* 28: 357–372. doi:10.1080/01443410701612008.
- Lau, S., and Y. Nie. 2008. "Interplay between Personal Goals and Classroom Goal Structures in Predicting Student Outcomes: A Multilevel Analysis of Person-Context Interactions." *Journal of Educational Psychology* 28: 15–29. doi:10.1037/0022-0663.100.1.15.
- Li, J. 2006. "Self in Learning: Chinese Adolescents' Goals and Sense of Agency." *Child Development* 77: 482–501. doi:10.1111/j.1467-8624.2006.00883.x.
- Liem, G. A. D. 2016. "Academic and Social Achievement Goals: Their Additive, Interactive, and Specialized Effects on School Functioning." *British Journal of Educational Psychology* 86: 37–56. doi:10.1111/bjep.12085.
- Liem, G. A. D., H. W. Marsh, A. J. Martin, D. M. McInerney, and A. S. Yeung. 2013. "The Big-Fish-Little-Pond Effect and a National Policy of Within-School Ability Streaming: Alternative Frames of Reference." *American Educational Research Journal* 50: 326–370. doi:10.3102/0002831212464511.



- Maehr, M. L. 1984. "Meaning and Motivation: Toward a Theory of Personal Investment." In *Research on Motivation in Education, Vol. 1*, edited by C. Ames and R. Ames, 115–144. New York: Academic Press.
- Markus, H. R., and S. Kitayama. 1991. "Culture and the Self: Implications for Cognition, Emotion and Motivation." *Psychological Review* 98: 224–253. doi:10.1037/0033-295x.98.2.224.
- Marsh, H. W., K.-T. Hau, and Z. Wen. 2004. "In Search of Golden Rules: Comment on Hypothesis-Testing Approaches to Setting Cutoff Values for Fit Indexes and Dangers in Overgeneralizing Hu and Bentler's (1999) Findings." *Structural Equation Modeling* 11: 320–341. doi:10.1207/s15328007sem1103\_2.
- McInerney, D. M. 2008. "Personal Investment, Culture and Learning: Insights into School Achievement across Anglo, Aboriginal, Asian and Lebanese Students in Australia." *International Journal of Psychology* 43: 870–879. doi:10.1080/00207590701836364.
- McInerney, D. M., L. Fasoli, P. Stephenson, and J. Herbert. 2012. "Building the Future for Remote Indigenous Students in Australia. An Examination of Future Goals, Motivation, Learning and Achievement in Cultural Context." In *Handbook on Psychology of Motivation: New Research*, edited by J. N. Franco and A. E. Svensgaard, 61–84. New York: Nove Science Pub .
- McInerney, D. M. 2012. "Conceptual and Methodological Challenges in Multiple Goal Research among Remote and Very Remote Indigenous Australian Students." *Applied Psychology* 61: 634–668. doi:10.1111/j.1464-0597.2012.00509.x.
- McInerney, D. M., H. W. Marsh, and A. S. Yeung. 2003. "Toward a Hierarchical Goal Theory Model of School Motivation." *Journal of Applied Measurement* 4: 335–357.
- McInerney, D. M., and J. Ali. 2006. "Multidimensional and Hierarchical Assessment of School Motivation: Cross-Cultural Validation." *Educational Psychology* 26: 595–612. doi:10.1080/01443410500342559.
- McInerney, D. M., J. Hinkley, M. Dowson, and S. Van Etten. 1998. "Aboriginal, Anglo, and Immigrant Australian Students' Motivational Beliefs about Personal Academic Success: Are There Cultural Differences?" *Journal of Educational Psychology* 90: 621–629. doi:10.1037/0022-0663.90.4.621.
- McInerney, D. M., and K. E. Sinclair. 1991. "Cross-Cultural Testing: Inventory of School Motivation." *Educational and Psychological Measurement* 51: 123–133. doi:10.1177/0013164491511011.
- McInerney, D. M., and K. E. Sinclair. 1992. "Dimensions of School Motivation: A Cross-Cultural Validation Study." *Journal of Cross-Cultural Psychology* 23: 389–406. doi:10.1177/0022022192233009.
- McInerney, D. M., L. A. Roche, V. McInerney, and H. W. Marsh. 1997. "Cultural Perspectives on School Motivation: The Relevance and Application of Goal Theory." *American Educational Research Journal* 34: 207–236. doi:10.3102/00028312034001207.
- McInerney, D. M., M. Dowson, and A. S. Yeung. 2005. "Facilitating Conditions for School Motivation: Construct Validity and Applicability." *Educational and Psychological Measurement* 65: 1046–1066. doi:10.1177/0013164405278561.
- Meece, J. L., E. M. Anderman, and L. H. Anderman. 2006. "Classroom Goal Structure, Student Motivation, and Academic Achievement." *Annual Review of Psychology* 57: 487–503. doi:10.1146/annurev.psych.56.091103.070258.
- Meece, J. L., and M. G. Jones. 1996. "Gender Differences in Motivation and Strategy Use in Science: Are Girls Rote Learners?" *Journal of Research in Science Teaching* 33: 393–406. doi:10.1002/(sici)1098-2736(199604)33:4<393::aid-tea3>3.3.co;2-3.
- Milfont, T. L., and R. Fischer. 2010. "Testing Measurement Invariance across Groups: Applications in Cross-Cultural Research." *International Journal of Psychological Research* 3: 111–121. doi:10.21500/20112084.857.
- Muthén, L. K., and B. O. Muthén. 1998–2017. *Mplus User's Guide, Eighth Edition*. Los Angeles, CA: Muthén & Muthén.



- Nasser, R., and D. M. McInerney. 2014. "Achievement Oriented Beliefs and Its Relation to Academic Expectation and School Achievement among Qatari Students." *Educational Psychology* 36: 1219–1241. doi:10.1080/01443410.2014.993928.
- Niles, S. 1998. "Achievement Goals and Means: A Cultural Comparison." *Journal of Cross-Cultural Psychology* 29: 656–667. doi:10.1177/0022022198295004.
- Oyserman, D., H. M. Coon, and M. Kemmelmeier. 2002. "Rethinking Individualism and Collectivism: Evaluation of Theoretical Assumptions and Meta-Analyses." *Psychological Bulletin* 128: 3–72. doi:10.1037/0033-2909.128.1.3.
- Pajares, F., S. L. Britner, and G. Valiante. 2000. "Relation between Achievement Goals and Self-Beliefs of Middle School Students in Writing and Science." *Contemporary Educational Psychology* 25: 406–422. doi:10.1006/ceps.1999.1027.
- Patrick, H., A. M. Ryan, and P. R. Pintrich. 1999. "The Differential Impact of Extrinsic and Mastery Goal Orientations on Males' and Females' Self-Regulated Learning." *Learning and Individual Differences* 11: 153–171. doi:10.1016/s1041-6080(00)80003-5.
- Purdie, N., and J. Hattie. 2002. "Assessing Students' Conceptions of Learning." *Australian Journal of Educational and Developmental Psychology* 2: 17–32.
- Qatar Statistics Authority. 2013. *Population Structure*. Qatar: Qatar Statistics Authority.
- Republic of the Philippines, National Statistics Office. 2010. *The 2010 Census of Population and Housing*. The Philippines: National Statistics Office.
- Roeser, R. W., C. Midgley, and T. C. Urdan. 1996. "Perceptions of the School Psychological Environment and Early Adolescents' Psychological and Behavioral Functioning in School: The Mediating Role of Goals and Belonging." *Journal of Educational Psychology* 88: 408–422. doi:10.1037/0022-0663.88.3.408.
- Rolland, R. G. 2012. "Synthesizing the Evidence on Classroom Goal Structures in Middle and Secondary Schools: A Meta-Analysis and Narrative Review." *Review of Educational Research* 82: 396–435. doi:10.3102/0034654312464909.
- Ryan, R. M., and E. L. Deci. 2000. "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being." *American Psychologist* 55: 68–78. doi:10.1037/0003-066x.55.1.68.
- Singapore Department of Statistics. 2010. *Census of Population 2010*. Singapore: Department of Statistics.
- Skaalvik, S., and E. Skaalvik. 2004. "Gender Differences in Math and Verbal Self-Concept, Performance Expectations, and Motivation." *Sex Roles* 50: 241–252. doi:10.1023/b:sers.0000015555.40976.e6.
- Smith, P. B. 2004. "Acquiescent Response Bias as an Aspect of Cultural Communication Style." *Journal of Cross-Cultural Psychology* 35: 50–61. doi:10.1177/0022022103260380.
- State Department, U. S. 2012. *International Religious Freedom Report for 2012: Qatar*. Washington, D.C.: U.S. Department of State. doi:10.1094/PDIS-11-11-0999-PDN.
- Statistics Netherlands. 2012. *Statline*. The Netherlands: CBS.
- Steinmayr, R., and B. Spinath. 2008. "Sex Differences in School Achievement: What are the Roles of Personality and Achievement Motivation." *European Journal of Personality* 22: 185–210. doi:10.1002/per.676.
- Tao, V. Y. K., and -Y.-Y. Hong. 2014. "When Academic Achievement Is an Obligation: Perspectives from Social-Oriented Achievement Motivation." *Journal of Cross-Cultural Psychology* 45: 110–136. doi:10.1177/0022022113490072.
- Tapola, A., and M. Niemivirta. 2008. "The Role of Achievement Goal Orientations in Students' Perceptions of and Preferences for Classroom Environment." *British Journal of Educational Psychology* 78: 291–312. doi:10.1348/000709907x205272.
- Urdan, T., and E. Schoenfelder. 2006. "Classroom Effects on Student Motivation: Goal Structures, Social Relationships, and Competence Beliefs." *Journal of School Psychology* 44: 331–349. doi:10.1016/j.jsp.2006.04.003.
- Urdan, T. C., and M. L. Maehr. 1995. "Beyond A Two-Goal Theory of Motivation and Achievement: A Case for Social Goals." *Review of Educational Research* 65: 213–243. doi:10.3102/00346543065003213.

- Van de Schoot, R., P. Lugtig, and J. Hox. 2012. "A Checklist for Testing Measurement Invariance." *European Journal of Developmental Psychology* 9: 486–492. doi:10.1080/17405629.2012.686740.
- Van Vugt, M., D. De Cremer, and D. P. Janssen. 2007. "Gender Differences in Cooperation and Competition: The Male Warrior Hypothesis." *Psychological Science* 18: 19–23. doi:10.1111/j.1467-9280.2007.01842.x.
- Watkins, D. A. 2000. "Learning and Teaching: A Cross-Cultural Perspective." *School Leadership and Management* 20: 161–173. doi:10.1080/13632430050011407.
- Watkins, D. A. 2007. "The Nature of Competition: The Views of Students from Three Regions of the People's Republic of China." In *Culture, Motivation, and Learning: A Multicultural Perspective*, edited by F. Salili and R. Hoosain, 217–233. Charlotte, NC: Information Age Publishing.
- World Economic Forum. 2013. *The Global Gender Gap Report 2013*. Geneva: World Economic Forum.
- Zijlsing, D., J. Keuning, H. Kuyper, T. V. Batenburg, and B. Hemker. 2009. "Cohortonderzoek COOL5–18. Technisch Rapport Eerste Meting in Het Derde Leerjaar Van Het Voortgezet Onderwijs." [Cohort study COOL5–18. Technical report of the first wave in the 9th grade of secondary education]. Groningen/ Arnhem, the Netherlands: GION/Cito.
- Zusho, A., and P. R. Pintrich. 2003. "A Process-Oriented Approach to Culture: Theoretical and Methodological Issues in the Study of Culture and Motivation." In *Teaching, Learning, and Motivation in a Multicultural Context*, edited by F. Salili and R. Hoosain, 33–65. Greenwich, CT: Information Age.
- Zusho, A., and K. Clayton. 2011. "Culturalizing Achievement Goal Theory and Research." *Educational Psychologist* 46: 239–260. doi:10.1080/00461520.2011.614526.

## Appendix A

### Cultural characteristics of the included societies

For easier interpretation of the results, a short overview of some relevant characteristics of the included societies is summarized here.

#### Singapore

Singapore is a non-Western society. The largest cultural groups in Singapore ([www.singstat.gov.sg](http://www.singstat.gov.sg)) are Chinese (74%), Malays (13%), and Indians (9%), and 3% come from other cultural backgrounds. The Malays and Indians originate from neighbouring countries (Malaysia and Indonesia). Singapore has four official languages: English, Mandarin Chinese, Malay, and Tamil. Typical for Singapore is the stratified educational system in which students are placed in different secondary education tracks based on their results in a national examination at the end of primary education. There are both co-educational as well as single-sex schools in Singapore, although the former is more common.

Singapore is characterized by a diversity of religions. The most followed religion is Buddhism (33%), followed by Christianity (18%). Other religions adhered to in Singapore are Taoism (11%) and Hinduism (5%). Indians are mostly Hindus, although a significant number is also Muslim. Additionally, the majority of the Malays are Muslim, resulting in an overall percentage of 15% of Islamic residents. Further, 17% of the population indicate that they are non-religious or are adherents of other religions (1%) (Singapore Department of Statistics 2010).

#### Hong Kong

Hong Kong is officially named 'Hong Kong Special Administrative Region of the People's Republic of China' since the transfer of sovereignty from the United Kingdom in 1997. Hong Kong's population is 95 percent cultural Chinese and 5 percent from other cultural groups (e.g. Indians, Pakistanis, Filipinos, British) (Hong Kong Government 2010). The main religions are Buddhism (21%) and Taoism (14%), and various local Chinese religions (49%), followed by

Christianity (12%), Islam (3%), Hinduism (< 1%) and Sikhism (<1%). The official languages are Cantonese and English.

The educational system is broadly based on the British educational system and is typically focused on high achievement for both males and females. Secondary education is not tracked as is the case in, for example, Singapore, however, secondary students do go to so-called 'banded' schools with Band 1 being considered the most desirable in comparison with Band 2 and Band 3. Admission is based on students' performance in primary school examinations. There are three main groups of secondary schools; government schools, subsidized schools (e.g. run by charitable bodies), and private schools. In the majority of the secondary schools Chinese is currently the medium of instruction. In about 28% of the schools English (still or again) is the medium of instruction. There are both co-educational as well as single-sex schools in Hong Kong, although the former is more common.

### **The Philippines**

The Republic of the Philippines represents a diverse population of multiple cultures that are found throughout the islands. The largest groups are formed by non-indigenous inhabitants from Southeast Asia; that is about 80% of the population. Next to small groups of other non-indigenous inhabitants from Western societies (mostly from Spain), about 60 indigenous cultures are found throughout the islands. The largest group are the Tagalogs (Republic of the Philippines National Statistics Office, 2010). Each indigenous group has its own culture, however, more than 90% of the population are Christians (mostly Roman Catholic) as a result of Spanish cultural influence in the history of the republic. The second largest religion in the Philippines is Islam (5%). Similar to Hong Kong and Singapore, the Philippine culture is a combination of Eastern (Asian) and Western cultures. An important difference is that the European influence generally originates from the Spaniards rather than the British as was the case in Singapore and Hong Kong. This is also represented by the differences in religion among the three societies.

Similar to Singapore and Hong Kong, co-education is more common than single-sex schools. The current educational system in secondary education is moderately tracked with a core curriculum for all students. There are both public and private schools in the Philippines. English and Filipino are both used as language of instruction from primary education onwards.

### **Australia**

Australia is officially called the 'Commonwealth of Australia'. The current population of Australia consists of a large group (> 90%) of Anglo-Australian inhabitants, several non-Western groups from diverse Asian origins (about 5%), and numerous smaller groups of non-Western inhabitants with various cultural backgrounds (e.g., 3% mainland Aboriginals and Torres Strait Islanders; Australian Bureau of Statistics 2011).

Australia is a Western society. Australia has no official language, although English (Australian English or General Australian) is spoken by the majority of the citizens as a de facto national language, and is used as a language of instruction in schools. Nevertheless, for 23% of the population, another language (e.g. Mandarin, Italian, Arabic, Vietnamese, or one of the about 70 Indigenous Australian languages) is commonly spoken at home. More than 60% of the Australians are Christians, 22% have no religion, and 7% follow a non-Christian religion, mostly Buddhism, Islam, or Hinduism (Australian Bureau of Statistics 2011).

The educational system in Australia is a comprehensive educational system which is not stratified, although there are selective public high schools which have competitive entry standards. Each state or territory government regulates the public and private schools in its own region. Currently, a national curriculum is being developed that will become mandatory in all schools. There are both co-educational and single-sex schools in Australia.

### **The Netherlands**

The Netherlands is a Western society. There are no single-sex secondary schools in the Netherlands. Similarly to Singapore, the Dutch educational system is highly tracked. Entering

the different tracks is based on students' results on national tests administered at the end of primary education as well as the primary school teachers' recommendations. Dutch is the medium of instruction in secondary schools, and a small percentage of schools offer a bilingual Dutch-English program.

Dutch and Frisian are the two official languages of the country (additionally, English is an official language in other parts of the Kingdom). The majority of the population of the Netherlands is ethnically Dutch (79%). Of the 21% non-Dutch population, 45% stems from other Western societies and 55% stems from non-Western societies (Statistics Netherlands 2012). The largest groups are Indonesian (2%), German (2%), Turkish (2%), Surinamese (2%), Moroccan (2%), Antillean and Aruban (1%).

The Netherlands is one of the most secular countries in Western Europe. More than 40% of the population is non-religious (Statistics Netherlands 2012). Only one in five people visits church regularly. Christianity is the most adhered to religion across the country. The largest religious group is Roman Catholic (29%), followed by Protestants (19%). Furthermore, 4% of the Dutch population is Muslim, and 4% follows other religions (Buddhism or Hinduism, or is Jewish or orthodox Christian).

### **Qatar**

Qatar is a sovereign Arab state in the Middle East. The Qatari culture can be considered an Arab culture. Shari'a (Islamic law) is the main source of legislation in Qatar. More than 80% of the population is Muslim, almost 9% is Christian, and 10% has another religion. Islam is, however, the state religion, adhered to by virtually all of the indigenous population (U.S. Department of State, 2012). Gender roles are relatively distinct, schooling is gender-segregated. High-level positions are held predominantly by men, whilst women take government jobs. An important fact is that women are only one-quarter of the population due to the large influx of foreign workers (Qatar Statistics Authority 2013).

Although Arab culture is widespread in Qatar, the population consists of multiple Arab and non-Arab groups: Qatari (Arab) 15%, other Arab 13%, Indian 24%, Nepali 16%, Filipino 11%, Sri Lankan 5%, Bangladesh 5%, Pakistani 4%, other 7% (U.S. Department of State, 2012). Arabic is the official language of Qatar. Schools are organized and controlled by the Supreme Education Council. As stated, single-sex education is dominant. Public schools use Arabic as language of instruction, private schools (e.g. international schools) use both English and Arabic as medium of instruction.

## **Appendix B**

Measurement invariance tests were conducted to analyse whether the ISM measured females' and males' school motivation with the same structure across different groups. Table B1 shows the results

**Table B1.** Invariance tests across males and females within each cultural group.

Model	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA	TLI	CFI
Chinese (Singapore)						
Configural model	6546.33	898	< .001	.06 (.06-.06)	.90	.91
Metric model	6535.86	926	< .001	.06 (.06-.06)	.90	.91
Scalar model	6640.33	986	< .001	.06 (.06-.06)	.91	.91
Malays (Singapore)						
Configural model	2162.75	898	< .001	.06 (.05-.06)	.90	.91
Metric model	2163.00	926	< .001	.05 (.05-.06)	.91	.91
Scalar model	2225.67	986	< .001	.05 (.05-.06)	.91	.91
Chinese (Hong Kong)						
Configural model	2079.44	898	< .001	.06 (.06-.06)	.85	.87
Metric model	2098.08	926	< .001	.06 (.06-.06)	.86	.87
Scalar model	2164.59	986	< .001	.06 (.06-.06)	.87	.87
Filipino (The Philippines)						
Configural model	2278.67	898	< .001	.05 (.04-.05)	.99	.99
Metric model	2284.68	926	< .001	.04 (.04-.05)	.99	.99
Scalar model	2505.77	986	< .001	.05 (.04-.05)	.99	.99
Indigenous Aboriginal Australians (Australia)						
Configural model	1282.78	898	< .001	.05 (.04-.05)	.95	.96
Metric model	1294.05	926	< .001	.04 (.04-.05)	.96	.96
Scalar model	1357.71	986	< .001	.04 (.04-.05)	.96	.96
Anglo-Australians (Australia)						
Configural model	1257.46	898	< .001	.06 (.05-.06)	.88	.89
Metric model	1279.36	926	< .001	.05 (.05-.06)	.89	.89
Scalar model	1337.57	986	< .001	.05 (.05-.06)	.89	.89
Dutch (The Netherlands)						
Configural model	4814.96	898	< .001	.05 (.05-.05)	.93	.94
Metric model	4945.02	926	< .001	.05 (.05-.05)	.93	.93
Scalar model	5164.12	986	< .001	.05 (.05-.05)	.93	.93
Qatari (Qatar)						
Configural model	2068.24	898	< .001	.05 (.05-.05)	.93	.94
Metric model	2003.77	926	< .001	.05 (.05-.05)	.94	.95
Scalar model	2087.57	986	< .001	.05 (.05-.05)	.94	.94

Note:  $\chi^2$  = chi-square; RMSEA = root mean square error of approximation; TLI = Tucker-Lewis index; CFI = comparative fit index.