UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Students' sense of belonging at school in 41 countries: cross-cultural variability

Chiu, M.M.; Chow, B.W.Y.; McBride, C.; Mol, S.T.

DOI
10.1177/0022022115617031

Publication date
2016

Document Version
Final published version

Published in
Journal of Cross-Cultural Psychology

License
Article 25fa Dutch Copyright Act (https://www.openaccess.nl/en/policies/open-access-in-dutch-copyright-law-taverne-amendment)

Link to publication

Citation for published version (APA):
Chiu, M. M., Chow, B. W. Y., McBride, C., & Mol, S. T. (2016). Students' sense of belonging at school in 41 countries: cross-cultural variability. *Journal of Cross-Cultural Psychology*, *47*(2), 175-196. https://doi.org/10.1177/0022022115617031

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, P.O. Box 19185, 1000 GD Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:08 Nov 2026

Journal of Cross-Cultural Psychology
2016, Vol. 47(2) 175–196
© The Author(s) 2015
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0022022115617031
jccp.sagepub.com
SAGE

Students' Sense of Belonging at School in 41 Countries: Cross-Cultural Variability

Ming Ming Chiu[1], Bonnie Wing-Yin Chow[2], Catherine McBride[3], and Stefan Thomas Mol[4]

Abstract

This study examined whether students' sense of belonging at school (SOBAS) differed across attributes of countries, families, schools, teachers, or students. Multilevel analyses of survey and test data from 193,073 15-year-old students in 41 countries yielded four main findings. First, students in more egalitarian cultures often had higher SOBAS than those in more hierarchical cultures. Second, the teacher–student relationship had the strongest link with SOBAS and mediated the link between egalitarianism and SOBAS. Third, collectivism was not significantly linked to SOBAS. Finally, family characteristics (immigrant status, language spoken at home, socio-economic status [SES], books at home, family wealth, and family communication), schoolmates' characteristics (SES and social communication), teacher characteristics (teacher–student relationship, teacher support and disciplinary climate), and student characteristics (reading achievement, self-efficacy, and self-concept) were also linked to students' SOBAS and accounted for most of its variance. This ecological model shows how attributes at multiple levels are related to SOBAS.

Keywords

sense of belonging, school, teacher–student relationship, cultural values

Students' sense of belonging at school (SOBAS) is central to both their psychosocial well-being and their academic success. SOBAS is a psychological state in which students "view schooling as essential to their long-term well-being, as reflected in their participation in academic and non-academic pursuits" and "relations with school staff and other students" (Willms, 2003, p. 8). Students with higher SOBAS frequently show higher cognitive and psychosocial functioning (L. H. Anderman & Freeman, 2004). Specifically, adolescents with higher SOBAS often show higher academic performance, higher intrinsic motivation, and more positive attitudes toward school (e.g., L. H. Anderman, 2003; Gonzalez & Padilla, 1997; Goodenow, 1993; Roeser,

[1]Purdue University, West Lafayette, IN, USA
[2]City University of Hong Kong, Hong Kong
[3]The Chinese University of Hong Kong, Hong Kong
[4]The University of Amsterdam, The Netherlands

Corresponding Author:
Ming Ming Chiu, Department of Educational Studies, Purdue University, 5156 Beering Hall, 100 North Street, West Lafayette, IN 47907, USA.
Email: mingmingchiu@gmail.com

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Midgley, & Urdan, 1996). Also, students with higher SOBAS generally have fewer psychological health and social problems, specifically lower rates of delinquency, reduced social rejection from peers, lower depression, fewer incidences of dropping out of school, and less use of illicit drugs (E. M. Anderman, 2002; Finn, 1989). Moreover, these relationships are bi-directional; SOBAS contributes to these psychological and social factors while these psychological and social factors influence SOBAS (e.g., Willms, 2003). Although past studies focused on how SOBAS affects different psychological and social outcomes, few studies have examined the extent to which various factors contribute to the development of SOBAS, underscoring the importance of recognizing SOBAS as an outcome variable in its own right.

Scholars have examined SOBAS for two main reasons. First, schools not only impart academic knowledge but also enhance psychological growth in their students. Having positive feelings toward school and a sense of belonging therein is a crucial aspect of psychological well-being during schooling. Second, studies of SOBAS can shed light on different pathways to life outside of school, such as occupational success and life satisfaction. Despite the importance of understanding SOBAS, few researchers have conducted studies of SOBAS, and most studies to date were based in North America, a comparatively limited cultural context.

In light of the longstanding interest in investigating culture-level antecedents of belongingness (Anant, 1969) and understanding the cross-level relationships between culture and individuals via multilevel analyses (van de Vijver, van Hemert, & Poortinga, 2008), we used a multilevel design to examine whether students' SOBAS differs across cultures. Against the backdrop of Baumeister and Leary's (1995) belongingness hypothesis, previous theoretical work, and empirical findings on the need to belong and SOBAS, we specifically tested the extent to which both hierarchy and collectivism affect adolescents' SOBAS. To address these issues, we analyzed data from 193,841 students in 41 countries.

The Importance of a Sense of Belonging

Sense of belonging is fundamental to individual well-being. According to Baumeister and Leary (1995), "human beings have a pervasive drive to form and maintain at least a minimum quantity of lasting, positive, and significant interpersonal relationships" (p. 497). A person embedded in a stable social network (e.g., a child with two parents and several close friends at school) is more likely than those without this network (e.g., orphans without friends) to have a greater sense of belonging.

Context is important to a person's sense of belonging. A person's need to belong might be satisfied by others in multiple life domains as any one life domain might have insufficient resources to completely fulfill one's need. For example, a woman who has close friendships at work but poor relationships with her family may satisfy her need to belong largely at work rather than at home. Because most people are exposed to multiple contexts, examining sense of belonging in specific contexts (e.g., work, school, home, family, church) is necessary for a comprehensive understanding of sense of belonging (Osterman, 2000).

Moreover, sense of belonging might differ substantially across cultures. In collectivistic cultures, which tend to emphasize interdependence, belonging to a social group (such as one's family or peer group) can be so strong that it effectively replaces the individual (or independent) self as the functional unit of conscious reflection (Markus & Kitayama, 1991). Hence, interdependent cultures that prioritize their constituents' needs to belong may differ from independent cultures that prioritize their constituents' needs for autonomy. Moreover, Suh (2007) argues that the self, especially in East Asian cultures, becomes more context sensitive as a result of a stronger need to belong; the self is more prone to react differently across various interpersonal situations. Thus, focusing on the general outcomes of belonging without considering context could obscure potentially insightful discoveries.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Cultural Values and SOBAS

Environmental context exerts an important influence on the development of SOBAS. According to Bronfenbrenner's (2005) ecological systems theory, various levels of environmental contexts and their interactions play prominent roles in human development. They include microsystems that refer to the immediate and direct contexts, such as family and school; mesosystems that are the interconnections between microsystems; and macrosystems that describe the culture in which the individuals live. This study focused on cultural macrosystems by investigating how collectivism and egalitarianism in countries could affect students' SOBAS. We examined both the links between specific cultural values and SOBAS and how microsystems (e.g., teacher–student relationship) mediate these links. The need to belong might be universally uniform or it might differ across cultures. Whereas Baumeister and Leary (1995) proposed the universality of the need to belong, we propose that the need to belong might be culture specific. If needs fulfillment is related to subjective well-being (Diener & Lucas, 2000), then cross-cultural differences in subjective well-being (e.g., Suh & Oishi, 2011) imply that cultures differentially succeed in meeting their constituents' needs, such as the need to belong. We, therefore, considered how cultural values might account for differences in SOBAS, in an effort to examine whether SOBAS is indeed contingent upon culture.

Researchers have not investigated the relationship between SOBAS and cultural values, although some have examined the SOBAS of different racial or language groups (e.g., Faircloth & Hamm, 2005; Goodenow & Grady, 1993). Faircloth and Hamm (2005) examined SOBAS of adolescents who attended racially diverse high schools in North America; all students had higher SOBAS if they had better relationships with teachers, a higher engagement in school activities, or lower, perceived ethnic-based discrimination. Unlike Asian and Black American students, Latino and European American students who interacted with their peers more often had higher SOBAS. Although studies of this kind can identify differences among ethnic groups within schools within one society, they do not account for cultural differences across societies.

Across countries with different cultural values, SOBAS might differ. Specifically, two dimensions of cultural values, power distance (hierarchy vs. egalitarianism) and collectivism (vs. individualism; Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004) seem to have specific ramifications for the development and maintenance of interpersonal relationships that are fundamental to SOBAS. Among the issues that every society faces are (a) how to induce responsible individual behaviors and (b) whether to prioritize the interests of individuals or those of groups. To encourage responsible behaviors, a society might assign hierarchical roles and teach its citizens to obey authority (e.g., Romania). In contrast, more egalitarian societies, such as Switzerland, might encourage their citizens to appreciate their common humanity and thereby view, value, and act towards one another as equals. At the same time, a society may favor group interests (collectivism, e.g., Argentina) or individual interests (individualism, e.g., Sweden).

Power Distance and SOBAS

In egalitarian societies, people generally expect equal treatment regardless of their status; in hierarchical societies, however, less powerful members of institutions and organizations more readily accept the unequal distribution of power and their different statuses in society (House et al., 2004). "In an ideal job, it would be important to have a good working relationship with my direct superior" is one of the defining questions differentiating egalitarian versus hierarchical values (Hofstede, Hofstede, & Minkov, 2010, p. 92). People in egalitarian cultures such as Switzerland desire and try to cultivate friendly relationships with their superiors, peers, and subordinates (Hofstede et al., 2010). In more egalitarian cultures, people perceive one another as similar and more equal, so they are more likely to engage with one another, build friendships, and help one another (homophily bias; McPherson, Smith-Lovin, & Cook, 2001).

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

In hierarchical cultures such as Romania, however, people are expected simply to obey a superior; they do not expect to have friendships with those of different statuses (Hofstede et al., 2010). Likewise, superiors do not expect to be friends with their subordinates in hierarchical cultures (Mao, 2006). In India's caste system, for example, the Brahmin elite did not associate with untouchable Dalits, let alone befriend them (Dirks, 2001). Hence, in hierarchical cultures, people view those who differ in status as inherently different, so they are less likely to engage, interact, or support one another (Farh, Hackett, & Liang, 2007). Even among members of the same status, the desire for the privileges of greater status increase within-unit competition, resentful deviance, reduced member input, and withdrawal (Harrison & Klein, 2007). For these reasons, proportionally more relationships that are supportive are expected in egalitarian societies compared with hierarchical ones.

In the context of schools, students experience schooling primarily during classes directed by teachers, so teachers play a vital role in students' SOBAS (L. H. Anderman & Leake, 2007; Cemalcilar, 2010; Freeman, Anderman, & Jensen, 2007; Goodenow, 1993). Students with better teacher–student relationships or greater perceived teacher support had a higher SOBAS (see review by Osterman, 2000). Specifically, students' perceptions of their teacher (encouraging participation, enthusiasm, friendliness, helpfulness, organization, and preparation) accounted for nearly half of the variance in students' sense of belonging in class (Freeman et al., 2007).

As discussed above, people in egalitarian societies seek friendly and close relationships with their superiors, peers, and subordinates (Hofstede et al., 2010), so both teachers and their students are more likely to interact, build friendships, and help one another (McPherson et al., 2001), which contributes to greater SOBAS (Willms, 2003). In contrast, people do not expect to have friendships with those of different statuses; hence, students and teachers are less likely to interact and support one another (Farh et al., 2007; Hofstede et al., 2010). In short, students in hierarchical countries are expected to perceive greater status differences with teachers, interact with them less, have fewer friendly relationships with them, and consequently feel less SOBAS, compared with students in egalitarian countries.

Collectivism and SOBAS

Meanwhile, individualistic and collectivistic societies differ according to the strength of people's ties to one another within their social circles (Hofstede et al., 2010). People in collectivistic societies such as Argentina favor group interests, attend to one another, conform to group norms, and cooperate more than those in other societies. As people in collectivistic societies value group interests over individual interests, they emphasize group goals more than people in individualistic societies such as Sweden (House et al., 2004). To achieve these group goals, people in collectivistic cultures observe and listen to one another more carefully (Chiu & Chen, 2014). By doing so, they conform more closely to group norms, such as turn-taking (Chiu & Chow, 2011), which helps them cooperate more effectively than those in individualistic cultures to find consensus (Kirkman & Shapiro, 2001).

As classmates in collectivistic societies are expected to cooperate and help one another more effectively, they are more likely to influence a student's learning compared with those in other societies. Compared with that of students in individualistic countries, the academic achievement of students in collectivist countries was linked more strongly to classmates' past achievement (Chiu & Chow, 2015), and classmates' meta-cognitive strategies (Chiu, Chow, & McBride-Chang, 2007). Schoolmates' greater attentiveness to a student, greater adherence to group norms, more effective cooperation to reach group consensus can all serve to increase similarity among group members and enhance group cohesion (McPherson et al., 2001), which are expected to have a positive impact on SOBAS.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Teachers, Schoolmates, and SOBAS

Although schoolmates influence a student's SOBAS, teachers likely have a stronger impact on student SOBAS because teachers control classroom activities and are likely perceived to be the most proximal representative of their school; students spend most of their school time in class, where teachers primarily control the classroom environment through their design and implementation of discipline rules, learning activities, and assessments (McNeely, Nonnemaker, & Blum, 2002). Furthermore, a student primarily interacts with teachers inside school and during school hours, whereas school friends are likely to also meet outside school and outside school hours (Roeser et al., 1996). Thus, students tend to view their teachers as more closely connected with school, in comparison with their school friends. For all these reasons, teachers likely have greater influences than schoolmates on a student's SOBAS.

Furthermore, as power distance likely operates through teachers to affect SOBAS, and collectivism likely operates through students to affect SOBAS (as discussed above), we expect the power distance–SOBAS relationship to be stronger than the collectivism–SOBAS relationship. Power distance rather than collectivism drives the teacher–student relationship, defined as "verbal and nonverbal communication expressed by teachers that reduces both physical and psychological distance between teachers and students" (Neuliep, 1997, p. 431). Hence, we hypothesize that power distance, not collectivism, influences the student–teacher relationship, which in turn affects SOBAS. Although we explicate the theoretical link between collectivism and relationships among students, we lack the data to directly test it.

The Present Study

This study investigated how students' SOBAS might differ across countries with different cultural values. By analyzing the SOBAS of 193,073 15-year-olds across 41 countries, we tested whether correlates of SOBAS are universal or vary along cultural dimensions. Specifically, we tested four hypotheses.

Hypothesis 1 (H1): Hierarchy is negatively related to students' SOBAS.
Hypothesis 2 (H2): Collectivism is positively related to students' SOBAS.
Hypothesis 3 (H3): The hierarchy–SOBAS link is stronger than the collectivism–SOBAS link.
Hypothesis 4 (H4): Teacher–student relationship mediates the link between hierarchy and SOBAS.

As other country, family, school, classroom, and student characteristics might be linked to SOBAS, we included them as control variables (country income, income inequality, other cultural values, homophily, immigrant status, family socio-economic status [SES], educational resources at home, family communication, schoolmate family characteristics, gender, student academic achievement, self-efficacy, and self-concept). As other cultural values were not significantly related to SOBAS, we do not discuss them here.

Method

This study tested the above hypotheses with data on 15-year-olds in 41 countries. Although the analysis in this study resembles that of Chiu and Chow (2011), that journal article modeled classroom discipline, whereas this one models SOBAS.

Data

The Program for International Student Assessment (PISA) of the Organization for Economic Cooperation and Development (OECD; 2002a) assessed 193,073 15-year-olds' reading achievement

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

and asked students and principals to fill out questionnaires to evaluate education systems worldwide. International experts from OECD and non-OECD countries defined reading achievement, built assessment frameworks, created test items, forward- and backward-translated them, and pilot-tested them to check their validity and reliability (for details and sample items, see OECD, 2002b, and www.pisa.oecd.org). Participating students completed a 2-hr assessment booklet and then a 30- to 40-min questionnaire. We also used economic data (World Bank, 2004) and cultural values data (House et al., 2004).

Similar to OECD's PISA, a consortium of 150 researchers collected over 17,300 responses to a survey of cultural values from middle managers in finance, telecommunications, and food processing in 61 cultures (House et al., 2004). House et al. (2004) created all indices of cultural values from polychoric correlation-based factor analyses of managers' responses to questions on a 7-point Likert scale, so managers' cultural values serve as proxies for those of the entire nation, including its students. Note, however, that the variances of the two cultural values (power distance and collectivism) within a country exceeded its variances across countries (86% > 14% and 87% > 13%, respectively), and their internal consistencies were marginal (Cronbach's αs: .66 and .74, respectively; House et al., 2004). This introduces error into the cultural value measures and reduces statistical power to detect non-significant effects. Still, significant results retain their usual meanings.

Methodological Design

Investigating the above research questions across many countries and schools requires representative sampling, valid tests and questionnaires, and suitable statistical models. In each country, OECD (2002b) chose 150 representative schools based on neighborhood SES and student intake, and sampled at least 30 15-year-olds from each school (stratified sampling), without regard to their classes. OECD excluded students who were mentally incapable, refused to take the exam, could not physically take it, or did not speak the test language (less than 5% of the sample). Some countries sampled more students for their own specific purposes (e.g., to study racial minorities). All these 193,841 selected students received the test booklet. Of these 193,841 students, 193,073 students (99.6%) completed the SOBAS portion. With suitable weights, OECD (2002b) created representative samples of each country's schools and 15-year-olds.

Students received *subtests* (overlapping subsets of all multiple choice and open-ended questions) for wider coverage of reading skills while reducing student fatigue and test-learning effects (*balanced incomplete block* test; Baker & Kim, 2004). A graded response Rasch model of these subtests measured the difficulty of each test item to estimate each student's reading competence more precisely (Baker & Kim, 2004).

To reduce measurement error, multiple questionnaire items were used for each theoretical construct (e.g., SES) to create an index via a Rasch model (Warm, 1989). The multigroup Rasch models for each item in each country yielded similar parameters, indicating measurement equivalence across countries (May, 2006). (Unlike factor analysis, a multigroup Rasch model has the advantages of requiring only one invariant anchor item across countries and modeling heterogeneous use of the ordinal rating scale; Rossi, Gilula, & Allenby 2001.) Other studies also showed consistent questionnaire responses and participant understandings across countries (Brown, Micklewright, Schnepf, & Waldmann, 2007; OECD, 2002b; Schulz, 2003).

Multilevel analysis of plausible values yields more precise standard errors and reduces sampling error compared with ordinary least squares analyses (Goldstein, 1995; Monseur & Adams, 2009). As nested data (students within schools within countries) can have correlations among unexplained components (*residuals*) at each level that may bias the results, we used a multilevel analysis to separate the residuals into student (Level 1), school (Level 2), and country (Level 3) components, to remove the correlation and thereby remove the bias.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Missing questionnaire response data (4%) can reduce estimation efficiency, complicate data analyses, and bias results. Testing whether the data are missing in a systematic manner, the Little (1988) analysis result (p = .87) suggested that the data were missing completely at random (MCAR). (A true MCAR test requiring follow-up interviews of respondents was too costly.) Markov Chain Monte Carlo multiple imputation estimates the values of the missing data, which addresses these missing data issues more effectively than deletion, mean substitution, or simple imputation (Peugh & Enders, 2004).

Variables

SOBAS has been widely tapped by direct self-report measures. Some researchers argue that SOBAS is reflected through observable behavioral variables such as attendance and dropout rates (Rumberger & Thomas, 2000). However, studies have shown that the link between SOBAS and these behaviors is not necessarily strong (e.g., Willms, 2003). Hence, we used a more direct, self-reported measure of SOBAS from the OECD-PISA data collection (OECD, 2002b).

We modeled SOBAS using country-level variables, family variables, schoolmate family variables, school variables, and student variables. See Table 1 for summary statistics and descriptions of significant variables. We created *school means* of the family variables to examine how schoolmates' families were linked to a student's SOBAS. Hence, all schoolmate variables are at the school level. Likewise, we created school means of the teacher variables to examine how the school environment was linked to a student's SOBAS, as distinguished from specific teacher effects.

SES. To create the SES factor, we used LISREL software (Jöreskog & Sörbom, 2012) to conduct a single-level confirmatory factor analysis on the SES indicators. The results showed a good fit, root mean square error of approximation = .01, $\chi^2(1) = 0.18$, p = .68; Cronbach's alpha = .73; explained variance = .478; and high factor loadings (mothers' years of schooling = .73, fathers' years of schooling = .75, and highest job status of parents = .59). (Note that a random variable was added to enable sufficient degrees of freedom; for a detailed discussion, see Holmes-Smith, 1999.) Then, we computed the composite factor scores for this SES factor. OECD (2000) used Ganzeboom, de Graaf, and Treiman's (1992) index to measure the highest job status among a student's parents (ranging from 16 to 90). OECD (2002a) did not collect data on family income, which could have improved our measure of SES.

Homogeneity of students in schools by SES (homophily). We estimated the degree to which homogeneous students are *clustered* together in the same schools with the following ratio. We computed the ratio of variance of SES across schools over the country total SES variance. This ratio accounts for the differences in numbers of students both across schools and across countries, unlike the segregation index, dissimilarity index, and Gini coefficient (Gorard & Smith, 2004; Massey & Denton, 1988).

With such a large sample size, normality tests are overly sensitive, so a histogram is the best indicator of each variable's normality (Sheskin, 2004). Judging from the histograms, the distributions of variables were sufficiently close to normal. SOBAS had the highest skew of .52, whereas disciplinary climate had the highest kurtosis, 3.83. These are well within the acceptable limits for regression analysis, which yields robust results even when the variables' distributions deviate substantially from a normal distribution (Tabachnick & Fidell, 2006). As continuous student-level explanatory variables might have biased regression coefficients (if correlated with country-level random effects), they were centered on their country means to remove this bias.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 1. Summary Statistics of Significant Variables.

Variable	*M*	*SD*	Description
SOBAS	−0.02	0.97	A psychological state in which students "view schooling as essential to their long-term well-being, as reflected in their participation in academic and non-academic pursuits" and "relations with school staff and other students." Data collection was designed based on Willms's (2003) definition of SOBAS. Index of "I feel like an outsider," "I make friends easily," "I feel like I belong," "I feel awkward and out of place," "Other students seem to like me," and "I feel lonely." Choices were strongly disagree, disagree, agree, and strongly agree. Reliability = .77. Minimum = −3.40, Maximum = 2.33.
Country-level variables			
Log GDP per capita	9.09	0.60	Minimum = 7.625, Maximum = 9.881. Source: Heston, Summers, and Aten (2002). We also tested linear GDP per capita, but it did not fit the data as well.
GDP Gini (inequality)	35.14	8.42	Gini scores range from 0 (perfect equality with the same income for all) to 100 (one person has all the income). Minimum = 24.4, Maximum = 59.1. World Bank (2004).
Power distance	53	22	Hierarchical cultural value (vs. egalitarian). Minimum = 11, Maximum = 93. Source: House, Hanges, Javidan, Dorfman, and Gupta (2004).
Collectivism	52	23	In-group collectivism cultural value (vs. individualism). Minimum = 12.4, Maximum = 89.4. Source: House et al. (2004).
Masculine	49	19	Gender role rigidity cultural value (vs. gender egalitarianism). Minimum = 5, Maximum = 88. Source: House et al. (2004).
Uncertainty avoidance	69	22	The degree to which a person in society feels uncomfortable with a sense of uncertainty and ambiguity. Cultural value (vs. tolerance of uncertainty). Minimum = 23, Maximum = 112. Source: House et al. (2004).
SES homogeneity of schoolmates (Homophily)	0.29	0.10	Ratio of SES variance across schools over SES variance in a country. Minimum = 0.144, Maximum = 0.560.
Family variables at the student level			
First generation	0.04	0.19	1 = first generation (the student, mother, and father were all born outside the country)
Foreign language	0.11	0.32	1 = foreign language spoken at home
SES	−0.05	1.04	Standardized composite factor score created by CFA of mother's years of schooling, father's years of schooling, and highest parent job status. Minimum = −3.591, Maximum = 2.372.
Number of books at home	4.18	1.58	"How many books are there in your home?" Percent of students who made each choice are in parentheses: (a) none (2%), (b) 1-10 books (13%), (c) 11-50 books (23%), (d) 51-100 books (21%), (e) 101-250 books (18%), (f) 251-500 books (13%), and (g) more than 500 books (10%). Regressions with dummy variables representing each sub-range of books showed linear effects and substantively identical findings. So, we use this ordered variable to facilitate interpretation.

(continued)

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 1. (continued)

Variable	*M*	*SD*	Description
Family wealth	−0.48	1.21	The financial situation at home. Index of "Which items do you have in your home?": (a) a dishwasher, (b) a room of your own, (c) educational software, (d) a link to the Internet, (e) mobile phones, (f) television sets, (g) computers, (h) motor cars, and (i) bathrooms. Choices for (a) to (d) were yes or no. Choices for (e) to (i) were: 0, 1, 2, and 3 or more. Reliability = .70. Minimum = −5.05, Maximum = 3.38.
Family social communication	0.02	1.02	The degree of social interactions with parents. Index of "How often students engaged with parents in: (a) discussing how well they were doing at school, (b) eating the main meal with them around a table, and (c) spending time simply talking with them." Choices were never or hardly ever, a few times a year, about once a month, several times a month, and several times a week. Reliability = .58. Minimum = −3.65, Maximum = 1.20.
Family cultural communication	0.06	1.02	The degree of interaction with parents on cultural issues. Index of "How often students engaged with parents in: (a) discussing political or social issues, (b) discussing books, films or television programs, and (c) listening to music." Choices were never or hardly ever, a few times a year, about once a month, several times a month, and several times a week. Reliability = .55. Minimum = −2.20, Maximum = 2.72.
Schoolmate family variables at the school level			
School SES	−0.05	0.68	School mean of SES. Minimum = −3.10, Maximum = 1.61.
School mean social communication	0.02	0.40	School mean of family social communication. Minimum = −1.84, Maximum = 1.20.
Student perceptions of teacher variables at the student level			
Teacher–student relationship	0.11	1.02	The quality of the relationships between teachers and students. Index of "Students get along well with most teachers," "Most teachers are interested in students' well-being," "Most of my teachers really listen to what I have to say," "If I need extra help, I will receive it from my teachers," and "Most of my teachers treat me fairly." Choices were strongly disagree, disagree, agree, and strongly agree. Reliability = .79. Minimum = −2.90, Maximum = 2.84.
Teacher support	0.04	0.96	The level of support given by the teacher. Index of "The teacher shows an interest in every student's learning," "The teacher gives students an opportunity to express opinions," "The teacher helps students with their work," "The teacher continues teaching until the students understand," "The teacher does a lot to help students," and "The teacher helps students with their learning." Choices were never, some lessons, most lessons, and every lesson. Reliability = .87. Minimum = −3.03, Maximum = 1.95.

(continued)

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 1. (continued)

Variable	*M*	*SD*	Description
Disciplinary climate	0.04	0.99	The level of students' discipline in class. Index of "The teacher waits a long time for students to quiet down," "Students cannot work well," "Students don't listen to what the teacher says," "Students don't start working for a long time after the lesson begins," "There is noise and disorder, " and "At the start of class, more than five minutes are spent doing nothing." Choices were never, some lessons, most lessons, and every lesson. Index was inverted, so low values show poorer discipline. Reliability = .81. Minimum = −2.96, Maximum = 2.92.
Student variables			
Reading score	471	109	Reading test scores. Minimum = 48, Maximum = 855.
Self-efficacy	0.03	0.87	The belief in one's capability to succeed academically. Index of "I am certain I can understand the most difficult material presented in readings," "I am confident I can do an excellent job on assignments and tests," and "I am certain I can master the skills being taught." Choices were almost never, sometimes, often, and almost always. Reliability = .70. Minimum = −2.90, Maximum = 2.28.
Academic self-concept	0.02	0.87	The belief in one's competence in school subjects. Index of "I learn things quickly in most school subjects," "I am good at most school subjects," and "I can do well in most school subjects." Choices were strongly disagree, disagree, agree, and strongly agree. Reliability = .79. Minimum = −2.51, Maximum = 1.85.

Note. All data are from PISA, unless otherwise specified. OECD (2002b) created Warm (1989) indices and tested them for reliability. PISA indices were initially standardized (*M* = 0, *SD* = 1) for OECD countries. Non-OECD countries were added later, so negative means indicate lower values for non-OECD countries. SOBAS = sense of belonging at school; CFA = confirmatory factor analysis; SES = socio-economic status; PISA = Program for International Student Assessment; OECD = Organization for Economic Cooperation and Development.

Analysis

We modeled SOBAS with four sets of explanatory variables at three levels: country (country variables), school (school variables), and student (family and student variables). First, country variables might affect family variables. As families often have at least some say in choosing their children's schools, family variables might affect school variables. All these might affect students. Hence, we entered the variables in four successive models as follows: (a) country, (b) family, (c) school, and (d) student (see variable descriptions in Table 1). The variables were entered in sequential sets to estimate the variance explained by each set through a multilevel analyses with MLn software (Rasbash & Woodhouse, 1995).

$$\begin{aligned}\mathbf{SOBAS}_{ijk} &= \beta_{000} + e_{ijk} + f_{0jk} + g_{00k} + \beta_{00u}\mathbf{Country}_{00k} + \\ &\beta_{vjk}\mathbf{Family}_{ijk} + \beta_{0wk}\mathbf{School}_{0jk} + \beta_{zjk}\mathbf{Student}_{ijk}\end{aligned} \quad (1)$$

The outcome $\mathbf{SOBAS}_{ijk}$ of student i in school j in country k has a grand mean intercept β_{000} with student, school, and country residuals (e_{ijk}, f_{0jk}, g_{00k}). To test H1, H2, and H3 regarding the direct relationships between the cultural values (House et al., 2004) and **SOBAS**, we entered country variables: economic growth (log GDP per capita), economic inequality (Gini), power

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

distance (hierarchical vs. egalitarian), collectivism (vs. individualism), and other cultural values (gender role flexibility, uncertainty avoidance, short-term orientation, harmony, mastery, external dynamism, and social cynicism) and homogeneity of students in schools by SES (**Country**, see Table 1). We tested whether sets of predictors were significant with a nested hypothesis test (χ^2 log likelihood; Kennedy, 2008). To formally test H3, we applied the Lagrange multiplier test, which determines whether one regression coefficient differs significantly from another (Kennedy, 2008). Then, we tested for interaction effects within **Country**. Non-significant variables were removed.

Next, we applied the procedure for **Country** to the *v* family variables: first generation, second generation, foreign language spoken at home, SES, number of books at home, family wealth, family social communication, and family cultural communication (**Family**). Applying a random effects model (Goldstein, 1995), we tested if the *v* student-level regression coefficients ($\beta_{vjk} = \beta_{v00} + f_{vjk} + g_{v0k}$) differed at the country level ($g_{v0k} \neq 0$?) or correlated with the above country characteristics (**Country**). Then, we applied the procedure for **Family** to the *w* school variables (the school means of each of the student-level family variables, teacher–student relationship, teacher support, and disciplinary climate [**School**]) and to the *z* student variables (girl, reading achievement, self-efficacy, and academic self-concept [**Student**]).

Finally, we tested whether the links between explanatory variables and SOBAS differed across countries due to economic characteristics or cultural values via a random effects model (Goldstein, 1995). Specifically, we tested whether or not the regression coefficients ($\beta_{xjk} = \beta_{x00} + g_{x0k}$) differed significantly at the country level ($g_{x0k} \neq 0$?). If so, we tested whether they depended on the aforementioned country characteristics (Country). We also tested all two-way interactions among variables within a country.

To test H4 regarding whether the teacher–student relationship mediates the hierarchy–SOBAS link, we used multilevel mediation tests across the above vectors (Krull & MacKinnon, 2001). For significant mediators, the proportional change was $1 - (b'/b)$, where b' and b were the regression coefficients of the explanatory variable, with and without the mediator in the model, respectively. Then, we did a three-level path analysis (Goldstein, 1995).

We report how a 10% increase in each continuous variable above its mean was linked to SOBAS (Result = $b \times SD \times [10\%/34\%]$; 1 $SD \approx 34\%$). As percent increase is not linearly related to standard deviation, scaling is not warranted.

We used an alpha level of .05. To reduce false positives, we used the two-stage linear step-up procedure, which outperformed 13 other methods in computer simulations (Benjamini, Krieger, & Yekutieli, 2006). For robustness, we did two-level regressions (school and student) for each country. Using standardized scores within each country, we repeated the three- and two-level analyses. The small sample of countries ($N = 41$) limits identification of non-significant country-level results (for a .4 effect size at $p = .05$, statistical power = .75; Konstantopoulos, 2008). We analyzed country-level and school-level residuals of regression coefficients for influential outliers to examine differences at the country level and at the school level.

Results

Summary Statistics

SOBAS varied substantially across countries from a low of −.46 in Hong Kong to a high of .45 in Israel (OECD mean = 0, $SD = 1$). Compared with a student in an average OECD country, students in Hong Kong averaged 16% lower SOBAS, whereas students in Israel averaged 15% higher SOBAS. The countries also varied from poor, very unequal, hierarchical, collectivist nations (e.g., Indonesia) to rich, relatively equal, egalitarian, individualistic ones (e.g., Switzerland). See Table 1 for summary statistics (see the appendix for correlation and covariance matrices).

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Explanatory Model

Country, family, schoolmate families, school, and student variables all explained differences in students' SOBAS (Table 2). Most of the variance in students' SOBAS occurred at the student level (92%), rather than at the school (3%) or country (5%) levels. Hence, students' SOBAS differed substantially among students within a school and much less between schools or between countries. All results discussed below describe first entry into the regression, controlling for the effects of all previously included variables.

Country. Power distance and homophily were linked to SOBAS. Specifically, when a country's hierarchical cultural value was 10% higher than the mean, its students averaged 1.3% lower SOBAS (−1.3% = −0.13 × 10%). This result shows that hierarchy is negatively related to students' SOBAS, supporting H1. Negatively correlated with hierarchical cultural values ($r = -.69$), log GDP per capita is not significantly linked to SOBAS in the regression model (they have a weak, direct correlation, $r = .08$). Although richer countries are often more egalitarian than poorer ones, only power distance (not a country's economy) is linked to SOBAS. Collectivism was not significantly linked to students' SOBAS, which failed to support H2. The remaining cultural values also did not show significant effects on SOBAS. These results along with the significant Lagrange multiplier test ($\chi^2 = 6.17$) showed that the hierarchy–SOBAS link is stronger than the collectivism–SOBAS link, supporting H3. In countries that clustered more homogeneous students within a school (as measured by students' family SES), students had higher SOBAS. This result suggests a homophily bias, as students with more schoolmates with similar SES have greater SOBAS. These country variables accounted for 2% of the total variance in student's SOBAS.

Family. Family characteristics (immigrant status, language spoken at home, SES, books at home, family wealth, and family communication) were also linked to SOBAS. These results suggest that a student's family characteristics can influence their experience at school. Family wealth mediated the relationship between hierarchical cultural value and SOBAS by 16% ($z = -7.0$, $p < .001$); this result indicates that students in more egalitarian cultures tend to have more family wealth and greater SOBAS, which is consistent with the high correlation between log GDP per capita and egalitarianism. Together, family variables accounted for an extra 3% of the variance in students' SOBAS.

School. Both schoolmates' characteristics (SES, family social communication) and teacher attributes (teacher–student relationship, teacher support, and disciplinary climate) were linked to students' SOBAS. Notably, the teacher–student relationship showed the strongest link to SOBAS. Furthermore, teacher–student relationship and disciplinary climate mediated the relationship between hierarchical cultural value and SOBAS by 24%, supporting H4 ($z = -2.4$, $p = .02$; $z = -2.7$, $p = .01$, respectively). Also, disciplinary climate and collectivism showed a positive interaction effect on students' SOBAS. Increasing both disciplinary climate and collectivism in a country by 10% above their means yielded an extra 0.2% increase in SOBAS beyond the increase linked to disciplinary climate alone. Together, these results show the importance of both teachers and schoolmates to a student's SOBAS. School variables accounted for an extra 7% of the differences in students' SOBAS.

Student. Student characteristics (reading achievement, self-efficacy, and self-concept) were linked to SOBAS. Reading achievement and collectivism in a country showed a positive interaction effect on students' SOBAS. Increasing both reading achievement and collectivism by 10% yielded an extra 1.1% increase in SOBAS above the increase linked to reading achievement

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 2. Summaries of Four Multilevel Regression Models of SOBAS, With Unstandardized Coefficients, Standard Errors (in Parentheses), and Standardized Coefficients.

	SOBAS			
Explanatory variable	Model 1:Country	Model 2: + Family	Model 3: + School	Model 4: + Student
Log real GDP per capita	.03	−.05	.02	−.02
	(0.08)	(0.08)	(0.07)	(0.07)
	.02	−.03	.01	−.01
Hierarchical	−.01*	−.01*	−.01***	−.01***
	(0.00)	(0.00)	(0.00)	(0.00)
	−.13	−.11	−.08	−.07
Collectivist	.00	.00	.00	.00
	(0.00)	(0.00)	(0.00)	(0.00)
	−.02	.01	.04	.03
SES homogeneity of schoolmates (Homophily bias)	.80*	.73*	.68*	.70*
	(0.32)	(0.32)	(0.29)	(0.27)
	.08	.08	.07	.07
First generation		−.06***	−.09***	−.10***
		(0.01)	(0.01)	(0.01)
		−.07	−.09	−.10
Foreign language spoken at home		−.08***	−.07***	−.07***
		(0.01)	(0.01)	(0.01)
		−.08	−.07	−.07
SES		.01***	.01***	.00
		(0.00)	(0.00)	(0.00)
		.02	.01	.00
Number of books at home		.02***	.02***	.01*
		(0.00)	(0.00)	(0.00)
		.03	.02	.01
Family wealth		.07***	.07***	.07***
		(0.00)	(0.00)	(0.00)
		.08	.09	.09
Family social communication		.12***	.09***	.08***
		(0.00)	(0.00)	(0.00)
		.13	.09	.08
Family cultural communication		.02***	.01***	.00
		(0.00)	(0.00)	(0.00)
		.03	.01	.00
School mean SES			.05***	.02***
			(0.01)	(0.01)
			.04	.02
School mean of family social communication			.07***	.03*
			(0.01)	(0.01)
			.03	.01
Teacher–student relationship			.18***	.16***
			(0.00)	(0.00)
			.19	.17
Teacher support			.08***	.08***
			(0.00)	(0.00)
			.08	.08

(continued)

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 2. (continued)

Explanatory variable	SOBAS			
	Model 1:Country	Model 2: + Family	Model 3: + School	Model 4: + Student
Disciplinary climate			.04***	.03***
			(0.00)	(0.00)
			.04	.04
Teacher–Student Relationship × Teacher Support			.04***	.04***
			(0.00)	(0.00)
			.04	.04
Teacher–Student Relationship × Disciplinary Climate			.03***	.03***
			(0.00)	(0.00)
			.04	.04
Disciplinary Climate × Collective			.00***	.00*
			(0.00)	(0.00)
			.01	.01
Reading achievement				.00***
				(0.00)
				.05
Reading Achievement × Collectivist				.00***
				(0.00)
				.05
Self-efficacy				.08***
				(0.00)
				.07
Academic self-concept				.05***
				(0.00)
				.04
Country	.44	.45	.57	.62
School	.00	.28	.39	.47
Student	.00	.03	.09	.10
Total	.02	.05	.12	.13

Note. SOBAS = sense of belonging at school; SES = socio-economic status.
*$p < .05$. **$p < .01$. ***$p < .001$.

alone. Together, these results show that a student's individual characteristics and accomplishments are related to his or her SOBAS. These variables accounted for an extra 1% of the differences in students' SOBAS.

This model accounted for 62% of the variance across countries, 47% of the variance across schools, and 10% of the variance across students.

Differences Across Countries and Schools

Regression coefficients varied substantially across countries (Table 3). Students with higher reading scores showed higher SOBAS in more collectivist countries (59%). In less collectivist countries such as Australia, Finland, and Sweden, students, respectively, averaged 5%, 3%, and 2% *lower* SOBAS per extra 10% of reading score.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Table 3. Summary of Two-Level Parameter Estimates Modeling SOBAS for Each Country (Upon First Entry).

	Regression coefficient				% of countries		
Predictor	*M*	*SD*	Minimum	Median	Maximum	Signif−	Signif+
First generation	−0.12	0.22	−0.76	−0.11	0.47	29%	0%
Foreign language spoken at home	−0.14	0.13	−0.52	−0.10	0.03	39%	0%
SES	0.07	0.04	−0.02	0.06	0.17	0%	76%
Number of books at home	0.04	0.02	−0.01	0.04	0.08	0%	63%
Family wealth	0.07	0.04	0.01	0.07	0.18	0%	80%
Family social communication	0.14	0.03	0.06	0.14	0.19	0%	98%
Family cultural communication	0.02	0.03	−0.04	0.03	0.11	0%	37%
School mean SES	0.04	0.08	−0.11	0.05	0.19	2%	24%
School mean family social communication	0.11	0.16	−0.31	0.11	0.67	2%	37%
Teacher–student relationship	0.21	0.04	0.07	0.21	0.28	0%	100%
Teacher support	0.08	0.04	0.02	0.08	0.21	0%	90%
Disciplinary climate	0.04	0.03	−0.03	0.03	0.17	0%	44%
Teacher–student relationship × Teacher support	0.04	0.02	0.00	0.04	0.11	0%	71%
Teacher–student relationship × Disciplinary climate	0.04	0.02	−0.02	0.04	0.08	0%	61%
Reading achievement	0.00	0.00	0.00	0.00	0.00	7%	59%
Self-efficacy	0.09	0.06	−0.08	0.10	0.26	0%	80%
Academic self-concept	0.05	0.06	−0.09	0.04	0.25	0%	46%

Note. Signif− vs. Signif+ indicates proportion of countries with significantly negative vs. positive results, respectively, for each explanatory variable. SOBAS = sense of belonging at school; SES = socio-economic status.

These results did not vary much across schools within a country. The regression coefficients of teacher–student relationship, the interaction of teacher–student relationship and teacher support, and the interaction of teacher–student relationship and disciplinary climate varied across schools in 56%, 39%, and 32% of the countries, respectively. The remaining regression coefficients showed no significant differences across schools within a country. None of these schools showed significant explanatory variable results opposite to that of the overall result in their respective country.

Discussion

In this study, we examined whether sense of belonging is universal or differs across cultures. Four hypotheses were tested regarding two cultural values that might influence students' SOBAS, namely power distance and collectivism. The results supported three hypotheses, H1 (students in more hierarchical cultures have lower SOBAS), H3 (the hierarchical–SOBAS link is stronger than the collectivism–SOBAS link), and H4 (teacher–student relationship mediates the hierarchy–SOBAS link), but not H2 (students in more collectivistic cultures did not have significantly greater SOBAS). Nevertheless, family, schoolmate, and teacher attributes accounted for much more of the variance in SOBAS compared with country attributes.

Power Distance

As hypothesized (H1), students in more hierarchical cultures tended to have lower SOBAS, and this relationship was mediated by weaker teacher–student relationships (H4). When both country

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

income and cultural values were included in the regression model, only the cultural value of hierarchy-egalitarianism was significant, suggesting that this cultural value is more important to student SOBAS than economic conditions. Furthermore, these results support our proposed theoretical mechanism. In hierarchical countries, students likely perceive greater status differences with their teachers (Spencer-Oatey, 1997). As a result, these students might interact with them less often and have weaker relationships with them (McPherson et al., 2001) as compared with students in more egalitarian countries. As teachers both strongly influence students' behaviors and are strongly identified with schools (Skinner & Belmont, 1993), these students' weaker relationships with their teachers appear to reduce their SOBAS in hierarchical cultures. As the teacher–student relationship showed the strongest link to SOBAS, these results reinforce the importance of strong teacher–student relationships for students' SOBAS (Libbey, 2004), especially in more hierarchical societies.

In addition to the teacher–student relationship, perceived classroom discipline climate and family wealth also mediated the hierarchy–SOBAS link. As students in more hierarchical countries likely perceive greater status differences with their teachers (Spencer-Oatey, 1997), they might be less likely to follow their classroom rules, resulting in weaker classroom discipline (Gilligan, 1996). In classrooms with weaker discipline, a student is more likely to be disrespected by classmates and/or fear their disrespect (Chiu, 2009), which might reduce a student's SOBAS. Future studies can test these speculations.

The result showing that family wealth mediated the hierarchy–SOBAS link might be related to the above correlation between country income and hierarchy. People in more hierarchical cultures have less income and less family wealth. Another possibility is that students with less family wealth are less likely to attract friends and hence experience less SOBAS (Battistich, Soloman, Watson, & Schaps, 1997). Future studies can test these hypotheses.

Collectivism

Collectivism was not linked to SOBAS, though it moderated the disciplinary climate–SOBAS and reading achievement–SOBAS links. With greater sensitivity to their classmates' behaviors (Chiu & Chow, 2015), a student in a collectivist culture is more likely than one from an individualist culture to recognize, appreciate, and adopt well-disciplined classmates' model behaviors (Chiu, Chow, & McBride-Chang, 2007), receive positive feedback from teachers (Houghton, Wheldall, Jukes, & Sharpe, 1990), feel more connected to teachers (Chiu, Pong, Mori, & Chow, 2012), feel more successful at school (Roeser et al., 1996), and hence have a greater SOBAS (L. H. Anderman, 2003). However, a student in a collectivist culture is also more sensitive than one from an individualist culture to poorly disciplined students (Chiu & Chow, 2015), more likely to adopt their disruptive behaviors, receive negative feedback from teachers (Miller, Ferguson, & Byrne, 2000), feel less connected to the teacher (Chiu et al., 2012), feel less successful at school (Roeser et al., 1996), and hence have less SOBAS (L. H. Anderman, 2003). Likewise, a student from a collectivist culture is more likely than one from an individualist culture to both (a) benefit from high-achieving classmates' correct ideas (Chiu & Chow, 2015), be academically successful (Roeser et al., 1996), be praised by teachers, and have greater SOBAS (L. H. Anderman, 2003); and (b) be misled by low-achieving students' wrong ideas, show lower academic performance, feel academically unsuccessful (Roeser et al., 1996), and have lower SOBAS (L. H. Anderman, 2003).

These results are consistent with past studies showing greater sensitivity to classmates' behaviors and past achievement in collectivist cultures (Chiu & Chow, 2015; Chiu et al., 2007). In collectivist cultures (whether hierarchical, harmonious *face* or egalitarian, competitive *honor* ones), people accept and respond to others' evaluations of oneself, unlike people in individualist cultures (especially egalitarian *dignity* ones) who are generally indifferent to others' evaluations of oneself (Kim, Cohen, & Au, 2010). In short, students in collectivist cultures are more sensitive than students in individualist cultures to their classmates' actions, abilities, and judgments.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

As hypothesized (H4), the hierarchy–SOBAS link was stronger than the collectivism–SOBAS link. Although schoolmates influence a student's SOBAS, teachers likely have a stronger impact on student SOBAS not only because they control what happens in the classroom but also because they are likely viewed as the most proximal representative of their school. Students spend most of their school time in class, where teachers primarily control the classroom environment through their design and implementation of discipline rules, learning activities, and assessments. Furthermore, a student primarily interacts with teachers inside schools and during school hours, whereas school friends often meet outside school and outside school hours. Hence, students typically identify their teachers more closely with school in comparison with their school friends. For all these reasons, teachers likely have greater influence than do schoolmates on a student's SOBAS. As hierarchy (vs. egalitarian) is linked to the *student–teacher relationship* (which has the strongest link to SOBAS), it has a stronger link to SOBAS than collectivism does.

Limitations and Further Studies

The present study had at least four major limitations. First, this study only examined 15-year-olds, so the results might not generalize to students of different ages. Across cultures, adolescents often have stronger ties to peers than younger children do (Nickerson, 2005). Second, the present study included cross-sectional data across a wide variety of cultures. Future studies can collect longitudinal data to analyze how SOBAS might change over time, which can inform design of practical intervention strategies. Third, cultural values were country-level variables rather than individual-level variables, so we could not model possible conflicts between different cultural values at the country versus individual levels. Future researchers might investigate the effects of interactions between individual's and their country's cultural values. Specifically, the lack of a significant relationship between collectivism and SOBAS at the country level might be shrouded by cultural rejectionism at the individual level (Leung & Cohen, 2011). Fourth, this study zoomed in on a contextualized manifestation of sense of belongingness, namely, sense of belongingness at school. Future researchers can examine sense of belonging in different life domains to consider how they may interact to yield overall sense of belongingness.

Conclusion

This study of students in 41 countries showed that attributes of countries, families, schools, teachers, and students were related to students' SOBAS. Students in more hierarchical cultures perceive weaker relationships with their teachers, which in turn is linked to lower SOBAS. In contrast, students' SOBAS did not differ across collectivist versus individualistic cultural values. Students in countries with greater SES homogeneity of students within the same school also had higher SOBAS, suggesting a homophily bias.

Furthermore, family characteristics were related to students' SOBAS. Students who were first-generation immigrants or spoke a foreign language at home had lower SOBAS. In contrast, students in higher SES families, with more books at home, or with greater family wealth had higher SOBAS. Likewise, students who enjoyed greater family social or cultural communication also had higher SOBAS.

At school, schoolmate and teacher characteristics were also linked to a student's SOBAS. When schoolmates had higher family SES or greater social communication with their family, a student perceived greater SOBAS. Meanwhile, students who perceived a stronger relationship with their teachers, greater teacher support, or a more disciplined classroom climate experienced greater SOBAS. Teachers and schoolmates accounted for most of the explained variance in SOBAS.

Finally, student characteristics were also linked to their SOBAS. Students with greater self-efficacy, self-concept, or reading achievement had higher SOBAS. Together, these results highlight the need for a comprehensive ecological model for a full understanding of students' SOBAS.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Appendix

Correlation-Variance-Covariance Matrix of Outcome Variables and Significant Predictors.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	**0.93**	0.04	−2.57	−1.65	−0.05	−0.67	0.00	−0.01	−0.02	0.08	0.14	0.15	0.14	0.10	0.05	0.02	0.22	0.17	0.06	11.41	0.15	0.14
2	.08	**0.36**	−8.97	−12	0.38	−4.02	−0.03	0.01	−0.03	0.16	0.26	0.42	0.01	−0.02	0.16	0.01	−0.09	−0.03	−0.07	26.49	−0.02	0.00
3	−.12	−.69	**467**	342	7.97	248	0.51	−0.44	0.39	−3.83	−7.39	−14	1.52	0.81	−3.83	1.52	−1.88	0.23	−2.35	−691	0.25	−0.42
4	−.07	−.83	.68	**547**	−57	222	1.06	−0.37	0.63	−7.16	−9.76	−14	−0.31	0.86	−7.16	−0.31	2.46	−0.08	1.97	−922	0.06	−1.71
5	.00	.03	.02	−.13	**376**	40	0.56	0.07	−0.08	−0.12	−1.29	−0.96	−0.23	0.30	−0.12	−0.23	0.20	−0.33	1.60	−45	0.53	0.12
6	−.03	−.31	.53	.43	.10	**477**	0.92	−0.37	−0.53	−1.03	−1.40	−7.17	2.44	1.25	−1.03	2.44	−0.80	−0.76	0.11	−380	0.82	−0.77
7	.04	−.47	.24	.45	.29	.42	**0.01**	0.00	0.00	−0.02	−0.02	−0.04	0.01	0.01	−0.02	0.01	0.01	0.00	0.00	−2.80	0.01	0.00
8	−.03	.12	−.11	−.08	.02	−.09	−.10	**0.04**	0.01	0.00	−0.01	0.00	−0.01	0.00	0.00	0.00	0.00	0.00	0.00	−0.84	0.00	0.00
9	−.06	−.15	.06	.08	−.01	−.08	−.01	.24	**0.10**	−0.07	−0.07	−0.05	−0.03	−0.02	−0.05	−0.02	0.01	−0.01	0.01	−5.86	−0.01	−0.01
10	.08	.26	−.17	−.30	−.01	−.05	−.17	−.02	−.20	**1.08**	0.74	0.48	0.13	0.16	0.46	0.08	−0.08	−0.02	0.02	41.16	0.11	0.11
11	.09	.27	−.22	−.26	−.04	−.04	−.15	−.05	−.14	.45	**2.48**	0.66	0.24	0.31	0.46	0.11	−0.09	−0.03	0.02	72.45	0.16	0.15
12	.13	.58	−.52	−.51	−.04	−.27	−.32	.00	−.14	.39	.34	**1.45**	0.06	0.06	0.33	0.02	−0.13	−0.02	−0.13	48.47	0.04	0.04
13	.15	.02	.07	−.01	−.01	.11	.05	−.03	−.09	.13	.15	.05	**1.05**	0.44	0.08	0.16	0.12	0.16	0.05	13.96	0.12	0.11
14	.10	−.04	.04	.04	.02	.06	.09	−.01	−.05	.16	.19	.05	.42	**1.03**	0.06	0.08	0.11	0.12	0.02	15.18	0.16	0.14
15	.08	.39	−.26	−.45	−.01	−.07	−.26	.01	−.23	.66	.43	.40	.11	.09	**0.46**	0.08	−0.08	−0.02	0.01	32.80	0.05	0.05
16	.06	.05	.18	−.03	−.03	.28	.12	−.05	−.19	.19	.18	.04	.39	.20	.29	**0.16**	−0.01	0.02	0.00	7.97	0.02	0.03
17	.23	−.15	−.09	.10	.01	−.04	.07	.00	.03	−.07	−.06	−.11	.12	.10	−.12	−.03	**1.05**	0.42	0.20	−5.37	0.17	0.18
18	.18	−.05	.01	.00	−.02	−.04	.02	.01	−.03	−.02	−.02	−.02	.16	.12	−.02	.06	.43	**0.92**	0.13	−2.26	0.13	0.13
19	.06	−.11	−.11	.09	.08	.01	−.01	.01	.03	.02	.01	−.11	.04	.02	.02	.01	.20	.14	**0.98**	3.06	0.05	0.06
20	.11	.40	−.29	−.36	−.02	−.16	−.26	−.04	−.17	.36	.42	.37	.13	.14	.44	.18	−.05	−.02	.03	**11867**	10.18	13.94
21	.18	−.03	.01	.00	.03	.04	.08	.00	−.02	.12	.12	.04	.13	.18	.08	.06	.19	.16	.06	.11	**0.76**	0.41
22	.16	.01	−.02	−.08	.01	−.04	−.02	.00	−.02	.12	.11	.03	.12	.16	.09	.08	.21	.16	.07	.15	.54	**0.75**

Note. The correlations, variances, and covariances are along the lower left triangle, diagonal, and upper right triangle, respectively. (1) SOBAS, (2) log real GDP per capita, (3) power distance, (4) collective, (5) masculine, (6) uncertainty avoidance, (7) SES homogeneity of schoolmates, (8) first generation, (9) foreign language spoken at home, (10) SES, (11) number of books at home, (12) family wealth, (13) family social communication, (14) family cultural communication, (15) school mean SES, (16) school mean of family social communication, (17) teacher–student relationship, (18) teacher support, (19) disciplinary climate, (20) reading achievement, (21) self-efficacy, (22) academic self-concept. SOBAS = sense of belonging at school; SES = socio-economic status.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Acknowledgment

We are grateful to the Organization for Economic Cooperation and Development (OECD) for making this data set available for secondary analysis by placing it on a public website. We appreciate the research assistance of Yik Ting Choi.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Ming Ming Chiu is grateful for the support received from a Spencer Foundation grant.

Note

1. Participating countries included Argentina, Albania, Australia, Austria, Belgium, Brazil, Bulgaria, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong-China, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Korea, Latvia, Liechtenstein, Luxembourg, FYR Macedonia, Mexico, Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Thailand, the United Kingdom, and the United States.

References

Anant, S. S. (1969). A cross-cultural study of belongingness, anxiety and self sufficiency. *Acta Psychologica*, *31*, 385-393.

Anderman, E. M. (2002). School effects on psychological outcomes during adolescence. *Journal of Educational Psychology*, *94*, 795-809.

Anderman, L. H. (2003). Academic and social perceptions as predictors of change in middle school students' sense of school belonging. *Journal of Experimental Education*, *72*, 5-22.

Anderman, L. H., & Freeman, T. M. (2004). Students' sense of belonging in school. In P. R. Pintrich & M. L. Maehr (Eds.), *Advances in motivation and achievement, Vol. 13. Motivating students, improving schools* (pp. 27-63). Amsterdam, The Netherlands: Elsevier.

Anderman, L. H., & Leake, V. S. (2007). The interface of school and family in meeting the belonging needs of young adolescents. In S. B. Mertens, V. A. Anfara, & M. M. Caskey (Eds.), *The young adolescent and the middle school* (pp. 163-182). Charlotte, NC: Information Age Publishing.

Baker, F. B., & Kim, S. H. (Eds.). (2004). *Item response theory: Parameter estimation techniques*. Boca Raton, FL: Taylor & Francis.

Battistich, V., Soloman, D., Watson, M., & Schaps, E. (1997). Caring school communities. *Educational Psychologist*, *32*, 137-151.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529.

Benjamini, Y., Krieger, A. M., & Yekutieli, D. (2006). Adaptive linear step-up procedures that control the false discovery rate. *Biometrika*, *93*, 491-507.

Bronfenbrenner, U. (2005). The developing ecology of human development: Paradigm lost or paradigm regained. In U. Bronfenbrenner (Ed.), *Making human beings human: Bioecological perspectives on human development* (pp. 94-105). Thousand Oaks, CA: Sage.

Brown, G., Micklewright, J., Schnepf, S. V., & Waldmann, R. (2007). International surveys of educational achievement: How robust are the findings? *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *170*, 623-646.

Cemalcilar, Z. (2010). Schools as socialisation contexts: Understanding the impact of school climate factors on students' sense of school belonging. *Applied Psychology*, *59*, 243-272.

Chiu, M. M. (2009). Inequalities' harmful effects on both disadvantaged and privileged students: Sources, mechanisms, and strategies. *Journal of Education Research*, *3*, 109-128.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Chiu, M. M., & Chen, G. (2014). Collectivism. In L. Ganong, M. Coleman, & G. J. Golson (Eds.), *The social history of the American family* (pp. 254-256). Thousand Oaks, CA: Sage.

Chiu, M. M., & Chow, B. W.-Y. (2011). Classroom discipline across forty-one countries: School, economic, and cultural differences. *Journal of Cross-Cultural Psychology*, *42*, 516-533.

Chiu, M. M., & Chow, B. W.-Y. (2015). Classmate characteristics and student achievement in 33 countries: Classmates' past achievement, family socioeconomic status, educational resources and attitudes toward reading. *Journal of Educational Psychology*, *107*, 152-169.

Chiu, M. M., Chow, B. W.-Y., & McBride-Chang, C. (2007). Universals and specifics in learning strategies: Explaining adolescent mathematics, science, and reading achievement across 34 countries. *Learning and Individual Differences*, *17*, 344-365.

Chiu, M. M., Pong, S. L., Mori, I., & Chow, B. W.-Y. (2012). Immigrant students' cognitive and emotional engagement at school: A multilevel analysis of students in 41 countries. *Journal of Youth and Adolescence*, *41*, 1409-1425.

Diener, E., & Lucas, R. E. (2000). Explaining differences in societal levels of happiness: Relative standards, need fulfillment, culture, and evaluation theory. *Journal of Happiness Studies*, *1*, 41-78.

Dirks, N. B. (2001). *Castes of mind*. Princeton, NJ: Princeton University Press.

Faircloth, B. S., & Hamm, J. V. (2005). Sense of belonging among high school students representing 4 ethnic groups. *Journal of Youth and Adolescence*, *34*, 293-309.

Farh, J.-L., Hackett, R. D., & Liang, J. (2007). Individual-level cultural values as moderators of perceived organizational support–employee outcome relationships in China: Comparing the effects of power distance and traditionality. *Academy of Management Journal*, *50*, 715-729.

Finn, J. (1989). Withdrawing from school. *Review of Educational Research*, *59*, 117-142.

Freeman, T. M., Anderman, L. H., & Jensen, J. M. (2007). Sense of belonging in college freshmen at the classroom and campus levels. *Journal of Experimental Education*, *75*, 203-220.

Ganzeboom, H. B. G., de Graaf, P., & Treiman, D. J. (with de Leeuw, J.). (1992). A standard international socio-economic index of occupational status. *Social Science Research*, *21*, 1-56.

Gilligan, J. (1996). *Violence: Our deadly epidemic and its causes*. New York, NY: G.P. Putnam.

Goldstein, H. (1995). *Multilevel statistical models*. Sydney, Australia: Edward Arnold.

Gonzalez, R., & Padilla, A. M. (1997). The academic resilience of Mexican American high school students. *Hispanic Journal of Behavioral Sciences*, *19*, 301-317.

Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *The Journal of Early Adolescence*, *13*, 21-43.

Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education*, *62*, 60-71.

Gorard, S., & Smith, E. (2004). An international comparison of equity in education systems. *Comparative Education*, *40*, 15-28.

Harrison, D. A., & Klein, K. J. (2007). What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review*, *32*, 1199-1228.

Heston, A., Summers, R., & Aten, B. (2002). *Penn world table version 6.1*. Philadelphia: Center for International Comparisons at the University of Pennsylvania.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind* (3rd ed.). New York, NY: McGraw-Hill.

Holmes-Smith, P. (1999). *Structural equation modeling*. Canberra: Australia National University.

Houghton, S., Wheldall, K., Jukes, R., & Sharpe, A. (1990). The effects of limited private reprimands and increased private praise on classroom behaviour in four British secondary school classes. *British Journal of Educational Psychology*, *60*, 255-265.

House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks, CA: Sage.

Jöreskog, K. G., & Sörbom, D. (2012). *LISREL* 9.1: *User's reference guide*. Chicago, IL: Scientific Software.

Kennedy, P. (2008). *A guide to econometrics*. Malden, MA: Blackwell.

Kim, Y.-H., Cohen, D., & Au, W.-T. (2010). The jury and abjury of my peers: The self in face and dignity cultures. *Journal of Personality and Social Psychology*, *98*, 904-916.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Kirkman, B. L., & Shapiro, D. L. (2001). The impact of team members' cultural values on productivity, cooperation, and empowerment in self-managing work teams. *Journal of Cross-Cultural Psychology*, *32*, 597-617.

Konstantopoulos, S. (2008). The power of the test for treatment effects in three-level cluster randomized designs. *Journal of Research on Educational Effectiveness*, *1*, 66-88.

Krull, J. L., & MacKinnon, D. P. (2001). Multilevel modeling of individual and group level mediated effects. *Multivariate Behavioral Research*, *36*, 249-277.

Leung, A. K. Y., & Cohen, D. (2011). Within-and between-culture variation: Individual differences and the cultural logics of honor, face, and dignity cultures. *Journal of Personality and Social Psychology*, *100*, 507-526.

Libbey, H. P. (2004). Measuring student relationships to school: Attachment, bonding, connectedness, and engagement. *Journal of School Health*, *74*, 274-283.

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*, 1198-1202.

Mao, H.-Y. (2006). The relationship between organizational level and workplace friendship. *The International Journal of Human Resource Management*, *17*, 1819-1833.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review*, *98*, 224-253.

Massey, D., & Denton, N. (1988). The dimensions of residential segregation. *Social Forces*, *67*, 281-315.

May, H. (2006). A multilevel Bayesian IRT method for scaling socioeconomic status in international studies of education. *Journal of Educational and Behavioral Statistics*, *31*, 63-79.

McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting school connectedness: Evidence from the National Longitudinal Study of Adolescent Health. *Journal of School Health*, *72*, 138-146.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27*, 415-444.

Miller, A., Ferguson, E., & Byrne, I. (2000). Pupils' causal attributions for difficult classroom behaviour. *British Journal of Educational Psychology*, *70*, 85-96.

Monseur, C., & Adams, R. (2009). Plausible values: How to deal with their limitations. *Journal of Applied Measurement*, *10*, 320-334.

Neuliep, J. W. (1997). A cross-cultural comparison of teacher immediacy in American and Japanese college classrooms. *Communication Research*, *24*, 431-451.

Nickerson, A. B. (2005). Parent and peer attachment in late childhood and early adolescence. *The Journal of Early Adolescence*, *25*, 223-249.

Organization for Economic Cooperation and Development. (2000). *Education at a glance: OECD indicators*. Paris, France: Author.

Organization for Economic Cooperation and Development. (2002a). *Manual for the PISA 2000 database*. Paris, France: Author.

Organization for Economic Cooperation and Development. (2002b). *PISA 2000 technical report*. Paris, France: Author.

Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research*, *70*, 323-367.

Peugh, J. L., & Enders, C. K. (2004). Missing data in educational research. *Review of Educational Research*, *74*, 525-556.

Rasbash, J., & Woodhouse, G. (1995). *MLn command reference*. London, England: Multilevel Models Project, Institute of Education.

Roeser, R. M., Midgley, C., & Urdan, T. (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.

Rossi, P. E., Gilula, Z., & Allenby, G. M. (2001). Overcoming scale usage heterogeneity. *Journal of the American Statistical Association*, *96*, 20-31.

Rumberger, R. W., & Thomas, S. L. (2000). The distribution of dropout and turnover rates among urban and suburban high schools. *Sociology of Education*, *73*, 39-67.

Schulz, W. (2003). *Validating questionnaire constructs in international studies*. Camberwell: Australian Council for Educational Research.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016

Sheskin, D. J. (2004). *Handbook of parametric and nonparametric statistical procedures* (3rd ed.). Boca Raton, FL: Chapman & Hall/CRC.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, *85*, 571-581.

Spencer-Oatey, H. (1997). Unequal relationships in high and low power distance societies: A comparative study of tutor-student role relations in Britain and China. *Journal of Cross-Cultural Psychology*, *28*, 284-302.

Suh, E. M. (2007). Downsides of an overly context-sensitive self: Implications from the culture and subjective well-being research. *Journal of Personality*, *75*, 1321-1343.

Suh, E. M., & Oishi, S. (2011). Subjective well-being across cultures. *Online Readings in Psychology and Culture*, *10*(1), 1-11. doi:10.9707/2307-0919.1076

Tabachnick, B. G., & Fidell, L. S. (2006). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.

van de Vijver, F. J. R., van Hemert, D. A., & Poortinga, Y. H. (Eds.). (2008). *Multilevel analysis of individuals and cultures*. New York, NY: Lawrence Erlbaum.

Warm, T. A. (1989). Weighted likelihood estimation of ability in item response theory. *Psychometrika*, *54*, 427-450.

Willms, J. D. (2003). *Student engagement at school: A sense of belonging and participation*. Paris, France: Organization for Economic Cooperation and Development.

World Bank. (2004). *The world development report 2003*. Oxford, UK: Oxford University Press.

Downloaded from jcc.sagepub.com at Universiteit van Amsterdam on March 30, 2016