Academic Work Ethics and Student Outcomes:

Findings in a Global Perspective

Laurence T. Ogle, Center for Research in Mathematics and Science Education,
San Diego State University (larogle@gmail.com)

Abstract

In *The Protestant Ethic and the Spirit of Capitalism*, Max Weber asked a central question: Why did capitalism develop first in Protestant rather than Catholic societies? He proposed that the Reformation *uniquely* joined a religious consciousness to a cultural ethos of hard work and achievement. This paper, drawing on data from PIRLS 2006 examines the evidence for differences in work ethics among fourth-graders internationally, with a special emphasis on children from historically Protestant countries – first, by determining which groups of countries appear to work the hardest (a proxy for the work ethic), and then by examining how closely this hard work is related to average student achievement. Findings indicate that the children in countries that should, according to Weber, have strong work patterns actually appear to have weak ones. In addition, there does not appear to be a consistent relationship internationally between hard work, as defined in this paper, and high levels of 4th-grader academic outcomes.

Keywords: Work ethics; Reading achievement; PIRLS 2006

Part I: Introduction

The role of work plays a central part in Western history, but attitudes about work and work patterns have evolved throughout the centuries. The ancient Greeks, for example, generally envisioned work as a drudgery foisted upon them by spiteful gods. But with the emergence of early Christianity, work took on a different meaning. In its earliest manifestations, Christians preached that if a believer completely trusted in God then work became less important, less necessary. The deity would provide (Ciulla, 2000).

Indeed, hard work that begat material success was often frowned upon by many early Christian thinkers, precisely because it was feared that "worldly" success might lead believers away from fidelity to God. These ideas about work appear to have crystallized into orthodoxy–until the advent of the Protestant Reformation. Then they were turned on their head. Instead of viewing work as peripheral to the life of faith, the Reformers came to see it as central component: a moral imperative, a commandment from God. Perhaps no Reformer better represents this changed attitude than Jean Calvin. He claimed that work, and especially material success gained from one's labor, instead of estranging the believer from the Almighty, were actually signs of membership in "the elect."

How did this change occur? It was likely due to the Calvinist doctrine of predestination. Calvinism asserted that all people were predestined "from the beginning" to either eternal

bliss or damnation. It was an unalterable condition. But the real problem was to discern in which direction one was predestined. Knowing one's fate (or the mind of God) was impossible, but gathering hints was not. This is where work began to play a critical role. Calvinists came to believe that if people worked hard and were materially rewarded, they were probably being favored as one of God's "elect." Less hard-working and less-successful souls, on the other hand, probably were not. Working hard, investing, and being seen as materially successful, therefore, became a religious obsession. Thus ironically, while early Christians typically feared "worldly success," Reformation Protestants prayed for it!

Max Weber labeled these collective Protestant beliefs about labor "The Protestant Work Ethic" (2002). Among the most influential theories of early 20th-century social science, his hypothesis attempted to uncover why bourgeois capitalism arose first in Protestant rather than Catholic Western European countries (Norris and Inglehart, 2004). Importantly, Weber pointed out that the material conditions for the development of capitalism existed in many earlier societies, yet none of them developed the capitalist system. Why? Because, Weber argued, they all lacked a distinctive cultural ethos (Norris and Inglehart). And it was Protestantism *uniquely* that supplied that ethos.

As Weber understood it, the Protestant work ethic preached that individuals are called by God to work diligently and, in that process, to pursue financial rewards. And according to Weber it was values like those that would be directly responsible for driving the phenomenal capitalistic development of the Western Europe–especially Protestant Western Europe. But since there was no such corresponding ethos in Catholicism, there was little or no corresponding capitalist development.

Weber appeared to believe that this Protestant ethic was pervasive, influencing almost all members of Protestant societies (Norris and Inglehart, 2004). If true, it is likely that this influence extended to the children of these societies, as well. Extensive research suggests that children are, to varying degrees, influenced by the social mores of a society (see e.g., ter Bogt, Raaijmakers, and van Wel, 2003), and that schools, in particular, can serve as powerful agents or conveyors of these values (see e.g., Graham, 2005 and Apple, 2004). Thus, if Weber's theory was operationalized and widespread in Protestant societies, it is reasonable to expect that at least traces of it can be found among the children of these "historically Protestant" societies today–even if they are now highly secularized.

This brings us to the first purpose of this paper: to measure the work ethic of children around the world, with special attention to the children in historically Protestant countries. Unfortunately, there does not appear to be an international survey of children's *attitudes* towards work, and so a *direct* measure of this ethic is not possible. However, the Progress in International Reading Literacy Study (PIRLS) 2006, an international survey of fourth-graders and their reading skills does provide proxy data. That is, PIRLS student background

data indicate the level of work undertaken by fourth-graders in traditionally Protestant as well as other societies around the world – and it is these levels of work that will serve as our operationalized measure of their work ethic.

The second purpose of this paper is to determine if hard work makes a difference - in terms of student outcomes. Here we will briefly describe how these work patterns are related to PIRLS average fourth-grader reading achievement scores. The PIRLS survey includes an assessment of fourth-graders' reading literacy and those data will be incorporated in this part of the study. We will show the average reading achievement of fourth-graders internationally and indicate which work variables are, and are not, associated with average achievement scores.

The third purpose of this paper is to examine how helpful Weber and other theorists are in explaining the work patterns of fourth-graders found in this study. We will also briefly speculate about the meaning of fourth-grader work and its relationship to larger educational reform goals.

Part II. Methodology

Our first methodological goal was to find an organizing framework that would 1) collapse a large number of countries into smaller, more manageable units; 2) include countries beyond Europe; and 3) used religion, at least to some extent, as one criterion for grouping these countries. Weber's work, developed early in the last century, included comparisons only between Protestant and Catholic Europe. Since our study incorporates participating PIRLS 2006 countries beyond that continent, use of the Weberian framework would not be appropriate. A more globalized framework was required. We settled on the "culture zone," mapping approach developed by Inglehart and Welzel (2005). Their schema permits us to collapse the 28 countries employed in this study into six culture zones (described below). Doing so might mask important individual country differences, but it allows (hopefully) for a much more efficient presentation of the data. In addition, these culture zones extend beyond Europe, and sometimes use religious heritage as a criteria for inclusion. These zones include many of the countries that participated in PIRLS 2006, and finally, culture zone scholars offer a theoretical position about work that we can (and will) evaluate.

What are these zones and how were they formed? Essentially, Inglehart and Welzel (2005) argue that socioeconomic development in societies brings about major social, cultural, and political changes. These changes lead to important and predictable changes in societal values, values that can be detected through the use of social surveys. Furthermore, according to Inglehart and Welzel, groups of countries with close shared cultural or

historical events or close geographic ties often share similar values. Countries grouped together in this way are called culture zones.

Data for mapping these zones were drawn from the World Values Survey (WVS, 1999-2004). From that survey, individual responses were aggregated to the country level, for each country. Countries were then mapped based on two sets of crossed values: 1) attitudes towards authority and 2) attitudes about self-expression. Finally boundaries around the countries were then drawn using Huntington's (1996) cultural zone approach, although the theorists claim that the WVS data alone would have been sufficient to draw these boundaries. Importantly, Inglehart and Welzel (2005) argue that religious traditions and colonial histories typically appear to leave an "enduring legacy" that should be detectable, at least to some extent, in the attitudes and habits of the current inhabitants of a zone today. Thus, traditions with long histories like Protestantism and Communism should be detectable in present-day societies even if these once Protestant societies are now highly secularized or previously communist societies now show capitalist leanings.

Using this mapping procedure, 28 of the 40 of the PIRLS 2006 participating countries were combined into 6 culture zones including: two sets of historically Protestant countries (European Protestant and English-speaking); two sets of traditionally Catholic countries (West and East Catholic); one historically Orthodox zone; and one zone of historically Confucian countries[1] (see Figure 1). (Throughout this study, we will employ the term "European or European-originating zones" when speaking about all of the culture zones in this study, except the Confucian zone.) According to the World Bank (2010), most of the countries in these zones are developed countries. However, two countries in the East Catholic zone (Lithuania and Poland) are classified as "developing," as are all of the countries in the Orthodox zone. These zones were created in SPSS by recoding the IDs of individual countries from the PIRLS 2006 *idzone* variable into separate culture zones (see George and Mallery, 2003). The resulting culture zones for this study typically include many but not all of the countries in the zones created by Inglehart and Welzel (2005). Also, in some instances (e.g., in the United Kingdom, Canada, and Belgium) separate jurisdictions (e.g., five Canadian provinces) in PIRLS 2006 were first joined together to represent one country, before they were combined with other countries into culture zones.

[1]Additional culture zones were not included in this study for the following reasons. First, the African cultural zone was represented by only two PIRLS 2006 participating countries: Morocco and South Africa. They are at opposite ends of the continent and differ in culture, religion, and development, and so this zone was not included. Second, since no South American countries participated in PIRLS 2006, no Latin zone could not be included in this study. Third, the participating PIRLS Muslim countries, while similar in religious heritage, substantially differ in location and development. More importantly for this analysis, their combined average score was at least 2 standard deviations below those produced by the other culture zones in this study. Since these scores play a key role in our analysis, and there is uncertainty about what those scores mean, Muslim zone countries were not included in this study.

[Insert Figure 1 about here]

As noted above, for this study the work ethics of fourth-graders will be inferred from their work patterns in each of these six zones. Specifically, the ethic will be measured by determining the percentage of fourth-graders who indicated that that they worked on a variable *every day or almost every day*[2]. Those students who indicated this level of response will be referred to as "hard-working" fourth-graders. This is a rather gross measure of hard work. However, our goal in this exploratory study is to determine who puts in the most time (not who is the most efficient), and from that perspective this measure serves our purposes well. Information about the fourth-graders' frequency of work will permit us to draw inferences about the work ethic operating in the various culture zones.

Instead of using homework as the only measure of student work, as is typically done, we have decided on a more integrated, "ecological" approach (see Bronfrenbrenner, 1979). To that end, variables will be drawn from three sectors of children's "work life": 1) reading work done in the classroom; 2) reading work done outside of school (but not homework); and 3) reading homework. Since this is an exploratory study, only a limited number of variables (10) that were thought to best represented fourth-grader work in reading were included. See Figure 2.

[Insert Figure 2 about here]

All student background data in this paper were derived from the PIRLS 2006 Student Background Questionnaire, and the assessment data came from the PIRLS 2006 assessment of fourth-grade reading literacy. Since cross-national comparisons were a part of this study, the data were "weighted" using the PIRLS "senate weights" (see recommendation by Rutkowski, Gonzalez, Joncas, and von Davier, 2010). In addition, since both plausible values and complex samples were used by PIRLS 2006, the AM statistical program (Cohen, 2010) which can analyze these types of data structures was employed throughout our analysis. An alpha level of .01 was used for all statistical comparisons.

Part III: Descriptive Statistics

This section presents descriptive statistics on three aspects of student work just identified: 1) Reading work done in class; 2) Reading work performed outside school (excluding homework); and 3) reading homework. For almost all of the variables, fourth-graders were

[2] There were four response levels of these variables: "never or almost never, once or twice a month, once or twice a week, every day or almost every day". The only exception is for the last homework variable. There we examined those fourth-graders who indicated that they received an hour or more of reading homework each day.

asked to indicate the frequency with which they worked on a variable: never or almost never, once or twice a month, once or twice a week, or never or almost never[3]. The numbers in each of the three tables below represent the percentage fourth-graders in a culture zone who indicated that they worked on a variable most frequently: *every day or almost every day*. Each variable was crossed by the 6 culture zones. Comparative statements for Tables 1 through 3 are derived from t tests found in Appendix A.

Table 1 shows the percentage of fourth-graders in the six culture zones who worked every day or almost every day on four *classroom variables*. The lowest percentages of these hard-working fourth-graders were generally found in the Confucian and Protestant Europe zones. The highest percentage of hard-working fourth-graders was typically found in the Orthodox zone. In general, the percentage of hard-working fourth-graders in the English-speaking zone and the two Catholic zones appeared to fall between these two.

[Insert Table 1 about here]

Data in Table 2 come from student work that took place *outside of school*. In this Table, the culture zones with the lowest percentages of hard-workers were the Confucian, Protestant Europe, and the English-speaking zones, while the zone with the consistently highest percentage of hard workers was the Orthodox zone. In most cases, the percentage of hard-workers in the Confucian zone was well-below that of the other culture zones, including the percentage who indicated that they *read for fun outside of school*. As was the case in Table 1, the percentage of hard-workers in the two catholic zones appears to fall in the middle.

[Insert Table 2 about here]

The data in Table 3 reflect *homework activities* of fourth-graders. Once again, fourth-graders in the Confucian zone were far less likely than the students in the other zones to report reading for homework every day or almost every day, but they were almost 3 times more likely than their counterparts in the Protestant Europe zone to report that when they had reading for homework they generally worked for more than one hour. Fourth-graders in the Protestant Europe zone were less likely to have an hour's worth of homework or to have reading for homework every day than were fourth-graders in other European or European-originating culture zones. As was generally the case in the two previous tables, the percentage of hard-working fourth-graders on both homework variables was highest in the Orthodox zone.

[Insert Table 3 about here]

[3] On the last variable the choices were: 1) never have reading to do for homework; 2) half an hour or less; 3) more than half an hour to one hour; 4) more than one hour.

In Table 4, we summarized and ranked the previous results of all the culture zones on each work variable (on a scale from zero to 5) and then summed these to an overall rank (which could range from 0 to 50). Fourth-graders in the Confucian and Protestant Europe zones produced the lowest total ranks, while fourth-graders in the Orthodox zone easily produced the highest – meaning that the zones with the lowest percentage of hard-workers were the Confucian and Protestant Europe zones, and the zone with the highest percentage was the Orthodox. Fourth-graders in the East Catholic zone placed at the second highest position, indicating a relatively high percentage of hard-working fourth-graders. The West Catholic and the English-speaking zones scored very close overall, between the other zones.

[Insert Table 4 about here]

Part IV. Correlation and multiple regression

In this section we move beyond our examination of work patterns to ask if working hard makes any difference. That is, we examine if either the levels of hard work or the percentages of hard workers within a culture zone are systematically related to average PIRLS reading literacy scores. As a first step, Table 5 presents average PIRLS test scores for fourth-graders within each culture zone.

[Insert Table 5 about here]

The mean scores in Table 5 shows that the Confucian zone produced a significantly higher average score than the other five zones, while the Orthodox zone produced a significantly lower average score. For the other four zones, although there were some detectable differences, there was only a five point score difference between them (ranging from average scores of 531 to 536). Recall from the previous section that, in general, the culture zone with the highest percentage of hard-working fourth-graders was the Orthodox Zone while the lowest percentage was found in the Confucian zone, and the Protestant Europe zone was lowest among the European and European-originating zones. Results from a Spearman rank-order correlation analysis indicate that among the culture zones a strong inverse correlation of -.71 exists between rank on work variables and rank on average score.

Next, through the use of multiple regression, we examined the relationship between individual variables and average scores. For ease of interpretation, the first eight variables were reversed-ordered in terms of frequency: never or almost never, once or twice a month, once or twice a week, every day or almost every day[4]. Thus, a statistically significant positive coefficient would indicate that working more frequently was associated with higher average scores, while a statistically significant negative coefficient would indicate the

[4] The two homework variables did not require recoding.

working more frequently was associated with lower average scores. Table 6 provides the results of regressing average PIRLS 2006 reading scores on the 10 variables described in the first part of this analysis.

[Insert Table 6 about here]

The data from Table 6 indicate that only two work variables out of the 10 studied in this analysis appear to have a systematic positive relationship to average fourth-graders' reading scores: *read for fun outside of school* and *read silently alone in class*. Both variables are positively associated with average PIRLS scores for every culture zone examined, except the *read silently alone* variable for the fourth-graders in the Protestant Europe zone. There were only a few other positive associations and these appear to be randomly scattered within the zones.

This leads directly to the second conclusion: the majority of the work variables used in this paper in every zone appear to have either no association or to be negatively related to average PIRLS fourth-grader reading scores. In other words, except for the two variables just mentioned, there appears to be *no consistent positive relationship* between the hard work variables and average fourth-grader achievement for the variables examined in this paper. In fact, the regression analysis indicates that, generally, as increasing frequency levels of work are introduced, average scores tend to fall.

Finally, the R squared values suggest that generally the work variables included in this analysis do not appear to contribute substantially to average fourth-grader outcomes within most culture zones (except possibly in the English-speaking zone). However, some caution is necessary here. Since only ten variables were employed in this study, it might be expected that the relationships of these values would be relatively low, and at this point it is probably not wise to draw further inferences from this finding.

Part V: Summary and Discussion

Descriptive statistics suggest that work patterns across the six culture zones presented in this paper appear to be distinctive by the fourth-grade. The data also indicate that the percentage of hard-working fourth-graders is lowest in the Confucian and Protestant Europe culture zones and highest in the Orthodox zone. We have argued that this level of work actually operationalizes the on-going work ethics in those zones. If correct, these findings indicate that the work ethics of fourth-graders are weakest in areas like the Far East and Northern Europe and strongest in regions like the Eastern Europe.

Except for two variables–*reading for fun* and *reading silently alone every day or almost every day*–average test scores and regression results indicate that work patterns are, in general,

not positively related with average test scores. Thus, across the ten variables, the results suggest that working very hard in reading is not necessarily associated with high test scores.

We first attempt to explain these work patterns from a theoretical perspective. The Protestant work ethic hypothesis, as promulgated by Weber, does not appear to be very helpful. Three pieces of evidence support this conclusion. First, and most obviously, the historically Protestant Europe Zone appears to have one of the weakest work ethics–an apparent direct contradiction of the Weberian thesis. Second, both Catholic culture zones appear have a stronger work ethic than the European Protestant zone – again appearing to directly contradict what Weber might expect. The third piece of evidence is that the two historically Protestant zones (i.e., Protestant Europe, English-speaking) seem to have somewhat different work patterns. This finding would also seem to contradict Weber: If there were a "uniquely" Protestant work ethic, shouldn't it be found consistently across both those two "traditionally-Protestant" zones[5]?

Culture zone theorists, aware of some of these shortcomings, have proposed a variant to the Weberian thesis (Norris and Inglehart, 2004). While they agree that attitudes are essential in developing a work ethic, they disagree that the Protestant Work Ethic is *unique* to Protestantism. Rather they see it as part of a larger "materialistic values system*"* that is found most often among societies in need. They suggest that individuals in societies of scarcity work hard to improve their lot, and therefore their society will frequently profile as "hard-working." The Orthodox zone, for example, which is composed entirely of developing nations (World Bank, 2010), appears to fit this characterization.

Importantly, Norris and Inglehart (2004) predict that changes in socio-economic conditions will likely produce important changes in cultural attitudes and practices, including work ethics. So, if scarcity fades away, it is likely that a corresponding change in the work ethic will also take place. Precisely because the Northern European Protestant societies were the first to industrialize and reach high levels of development, they now appear to be the first to have moved beyond that same hard work ethic. They have, in the words of Norris and Inglehart, come to embrace "postmaterialist" values; a variety of pursuits other than just hard work.

If work ethics in a society are passed on to their children, as we argued above, than this hypothesis appears to fit well with our findings. Developing societies, like countries in the Orthodox zone, appear to have large percentages of hard-working fourth-graders, while the highly developed Protestant Europe zone has a much smaller percentage. Such patterns may be representing changed attitudes towards work occurring in these different cultures.

[5] Of course, it is possible that different historical and cultural events, such as differing immigration patterns, may have lead to different work patterns among these two traditionally-Protestant zones.

This brings us to our final concern: the relationships between hard work and average reading scores. Here we discuss two problems. First, recall from the multiple regression analysis that for most variables a pattern of *increasing* frequency of reading work (ranging from "never" to "every day or almost every day") was associated with *decreasing* average scores. This finding may be surprising, but at least two scenarios can explain it. It is possible that more frequent reading work generally leads to disengagement with reading, and average reading scores suffer. But, it is also possible that weak readers, who typically produce low reading scores, are simply given more reading work to improve their reading skills. Thus, their average low scores may not necessarily indicate that hard work is at odds with increased reading achievement. From our data it is not clear which, if either, scenario is correct.

Second, and closely related to our first finding, we found that, generally, culture zones with relatively low percentages of hard-workers produced relatively high average scores, while other zones with relatively higher percentages of hard-workers produced relatively low average scores. While again possibly surprising, this finding suggests that producing relatively high percentages of children with a hard-work ethic may not necessarily be related to high average national achievement.

Regardless of how these two results are interpreted, they clearly indicate that many fourth-graders in a number of culture zones are achieving in reading at high levels without extreme levels of hard work. Therefore, it is possible to speculate that increasing fourth-grader levels of work or increasing the number of students who work hard may not necessarily lead to increases in average reading achievement.

That there appears to be no clear relationship between hard work, by itself, and average reading achievement may not be surprising. After an extensive study of international mathematics and science achievement, Baker and LeTendre (2005) state that no single factor makes one country perform higher than others. Nevertheless, these researchers did find that two broad social factors appear to have a consistent (albeit not very powerful) association with achievement across countries: 1) wealthier countries generally outscore poorer ones; and 2) and countries with more equal access to educational resources–both human and material–also appear to do better[6].

The Baker-LeTendre hypothesis appears to fit the results of this study moderately well when the Confucian zone is included and better when only European or European-originating

[6] A recent large-scale study by Wilkinson and Pickett (2009) indicates that countries with greater equality almost always perform better than less equal societies on a wide-ranging set of social indicators.

zones are included[7]. That is, on average, fourth-graders in wealthy and equitable European or European-originating cultures zones tend to perform better than fourth-graders in those European or European-originating zones that are less wealthy and less equitable.

This finding has an important implication for educational policy. In some countries, there appear to be many in the general public and among education policymakers who insist that increasing children's workloads will lead directly to increases in educational achievement. From the results of this study, such a finding is at least premature, and probably unwarranted. More importantly, such a narrow focus on the work ethic might actually undermine educational improvement (Baker and LeTendre, 2005) because it has the potential to sap energy away from the broader, more important reforms that are really needed: the ones that improve access to the best teaching, best curricula, and best resources–for all students.

Limitations of this study and directions for future research

Limitations for this study include but were not limited to: 1) using responses only from fourth-grade students (and not from their parents or teachers); 2) using a small number of work variables; 3) drawing inferences about work ethics from work patterns; and 4) identifying "hard working" fourth-graders. More work in all these areas is required before firm conclusions can be drawn. Therefore, future research should include studies of older students, with additional respondents (such as teachers and parents), and with an expanded variable-set. Perhaps the most pressing need is to clearly identify and quantify in large-scale surveys what it means to be a "hard-worker."

[7] For gross national income per capita, see: http://www.nationsonline.org/oneworld/GNI_PPP_of_countries.htm. For equity rankings see: (UN Human Development Index: http://hdr.undp.org/en/statistics/).

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Figure 1

*Mapping of the Participating PIRLS 2006 Countries into 6 Inglehart-Welzel Culture Zones**

Protestant European	English-speaking	Western European Catholic	Eastern European Catholic	Eastern European Orthodox	Confucian
Denmark	Canada[a]	Austria	Hungary	Bulgaria	Chinese Taipei
Germany	New Zealand	Belgium[c]	Lithuania	Latvia	Hong Kong
Iceland	United Kingdom[b]	France	Poland	Macedonia	Singapore
Netherlands	United States	Italy	Slovakia	Moldova	
Norway		Spain		Romania	
Sweden				Russia	

*As noted, Inglehart and Welzel used data from the World Values Survey (WVS) to place countries in these culture zones. To be included in Figure 1, countries would have participated in both PIRLS 2006 and at least one iteration of the WVS. Typically, if a PIRLS 2006 participating country is not in Figure 1, that country either did not participate in the WVS, or did participate in both surveys but was placed well outside their geographic or cultural areas (e.g., Georgia was put into the South Asia zone; Israel into the Eastern European Catholic zone). In addition, several Muslim countries did participate in both surveys but were not included in Figure 1 because of data quality and/or assessment score issues. In all, 10 of the approximately 40 PIRLS 2006 countries are not included in Figure 1.

a Combines the five Canadian provinces from the PIRLS 2006 dataset.

b Combines both England and Scotland from the PIRLS 2006 dataset.

c Combines both Flemish and French Belgium from the PIRLS 2006 dataset.

SOURCE: Progress in International Reading Literacy Survey, 2006; World Values Survey, multiple years.

Figure 2

Student-level Variables from PIRLS 2006 used in this Study, with PIRLS 2006 Variable Name in Parentheses

Part 1: Classroom variables
1. Student reads aloud in class (ASBGTHC2)
2. Students reads silently alone in class (ASBGTHC4)
3. Students use workbook or worksheet in class (ASBGAFR1)
4. Students answer questions about what they read in class (ASBGAFR3)
Part 2: Outside school variables
5. Students read aloud outside school (ASBGTOC1)
6. Students listen to reading outside school (ASBGTOC2)
7. Students read for information outside school (ASBGTOC6)
8. Students read for fun outside school (ASBGTOC5)
Part 3: Homework variables
9. Students have reading for homework (How often?) (ASBGHWRD)
10. Students have reading for homework (How long?) (ASBGRHT)

SOURCE: Progress in International Reading Literacy Study, 2006.

Table 1

Percentage of Fourth-graders in a Culture Zone who Indicated that They Perform Reading Activities in the Classroom Everyday or Almost Everyday: 2006

Six culture zones	Read aloud in class	Read silently alone in class	Using workbook or worksheet in class	Answer questions in class
CONFUCIAN	4.7	51.4	34.6	13.1
PROTESTANT EUROPE	7.7	68.6	21.9	14.0
ENGLISH-SPEAKING	7.2	82.2	35.0	17.1
WEST CATHOLIC	32.0	65.2	35.4	29.0
EAST CATHOLIC	39.9	70.3	40.5	36.8
ORTHODOX	50.0	76.6	44.8	55.6

Note . See Appendix A, Table A-1, for associated t tests.

SOURCE: Progress in International Reading Literacy (PIRLS) 2006

Table 2

Percentage of Fourth-graders in a Culture Zone who Indicated that they Perform Reading Activities Outside of School Everyday or Almost Everyday: 2006

Six culture zones	Read Aloud Outside School	Listen to Reading Outside School	Read for Information Outside School	Read for Fun Outside School
CONFUCIAN	7.4	6.7	36.2	28.7
PROTESTANT EUROPE	22.5	12.1	31.2	42.6
ENGLISH-SPEAKING	17.2	14.6	41.0	38.7
WEST CATHOLIC	22.3	15.4	51.6	44.8
EAST CATHOLIC	25.8	17.3	56.0	44.8
ORTHODOX	35.7	22.3	61.2	43.6

Note . See Appendix A, Table A-2, for associated t tests.

SOURCE: Progress in International Reading Literacy (PIRLS) 2006

Table 3

Percentage of Fourth-graders in a Culture Zone who Indicated that they Performed Reading Homework Activities: 2006

Six culture zones	Reading for homework everyday	Reading homework for more than one hour
CONFUCIAN	17.5	15.0
PROTESTANT EUROPE	30.9	5.6
ENGLISH-SPEAKING	36.6	10.8
WEST CATHOLIC	29.3	8.3
EAST CATHOLIC	45.1	10.8
ORTHODOX	59.2	36.0

Note . See Appendix A, Table A-3, for associated t tests.

Source: Progress in International Reading Literacy Study (PIRLS) 2006

Table 4

Rankings on each Variable and Sum of Ranks for each Culture Zone, by Percentage of Fourth-graders in a Cultures Zone working Every Day or Almost Every Day in a Category

	Reading Work in the Classroom				***Reading Work Outside School***				***Reading Homework***		
Six culture zones	Read Aloud in Class	Read Silently Alone in Class	Use Workbook or Worksheet in Class	Answer Questions about Reading in Class	Read Aloud Outside School	Listen to Reading Outside School	Read for Information Outside School	Read for Fun Outside School	Have Reading for Homework Everyday	Have More than One Hour for Reading Homework	**Sum of Ranks**
CONFUCIAN	0	0	1	0	0	0	1	0	0	4	**6**
PROTESTANT EUROPE	2	2	0	1	3	1	0	2	2	0	**13**
ENGLISH-SPEAKING	1	5	2	2	1	2	2	1	3	3	**22**
WEST CATHOLIC	3	1	3	3	2	3	3	4	1	1	**24**
EAST CATHOLIC	4	3	4	4	4	4	4	5	4	2	**38**
ORTHODOX	5	4	5	5	5	5	5	3	5	5	**47**

NOTE. The rankings are for each variable and are to be read vertically. For each ranking in this table, the lower ranks indicate relatively lower percentages of hard-working fourth graders on this variable compared to fourth-graders in other culture zones. Higher ranks indicate relatively higher percentages of hard-working fourth-graders on this variable compared to fourth-graders in other culture zones. Rankings on each variable could ranged from 0 to 5, while the rankings on the sum of the ranks could range from 0 to 50.

SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006

Table 5

Average PIRLS Reading Proficiency Score, by Culture Zone: 2006

Culture Zone	Mean Score	Standard Error	Standard Deviation
Confucian	553	1.48	68.24
Protestant Europe	533	0.79	68.15
English-speaking	536	2.03	80.87
West Catholic	531	1.17	68.97
East Catholic	535	1.35	70.45
Orthodox	514	1.62	90.56

Note. The average score of each zone was compared against the average score of every other zone for statistical significance at the .01 level. The mean scores from the Confucian and Orthodox zones are highlighted in Table 5 because they are significantly different from all other mean scores, across zones. This is not the case for the mean scores of the remaining zones.

SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006

Table 6

Regression Coefficients for Individual Variables used in this study entered together and R Squared Values

	Reading Work in the Classroom				***Reading Work Outside School***				***Reading Homework***		
Six culture zones	Read Aloud in Class	Read Silently Alone in Class	Use Workbook or Worksheet in Class	Answer Questions about Reading in Class	Read Aloud Outside School	Listen to Reading Outside School	Read for Information Outside School	Read for Fun Outside School	Have Reading for Homework Everyday	Have More than One Hour for Reading Homework	R squared
Confucian	-1.84	16.52*	0.91	-4.61*	0.55	-4.97*	1.88*	11.32*	-3.7*	-5.9*	0.123
Protestant Europe	-0.10	0.60	-3.49*	0.15	-9.8*	-4.54*	-5.95*	19.04*	-5.15*	-3.14*	0.157
English-speaking	0.49	25.03*	-1.51	-9.18*	-9.64*	-7.32*	-9.37*	21.02*	3.12*	-1.07	0.216
West Catholic	-1.78	4.28*	-3.28*	-0.96	-3.97*	-5.83*	-2.61*	15.22*	4.67*	-11.44*	0.1
East Catholic	-5.13*	5.52*	3.09*	-2.43*	-5.88*	-8.45*	-0.71	17.54*	-0.77	-15.82*	0.132
Orthodox	-1.15	6.35*	-9.53*	7.25*	-9.13*	-13.62*	-0.37	17.96*	-0.41	-5.6*	0.119

* Indicates regression coefficient is statistically significant at the 0.01 level of significance.

Note . All variables in this multiple regression analysis were entered simultaneously for each culture zone. Highlighted cells in this table indicate a significant positive association between the variable and the average PIRLS reading literacy scores in that culture zone.

SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006

Table A-1

All Possible t-test Comparisons Among the Six Culture Zones for Reading Work Classroom Variables

Culture Zone Comparisons	Read Aloud in Class	Read Silently Alone in Class	Use Workbook or Worksheet in Class	Answer Questions in Class
Confucian vs. Protestant Europe	-5.82	-17.55	20.02	-1.59
Confucian vs. English-speaking	-4.95	-33.97	-0.29	-4.49
Confucian vs. West Catholic	-35.50	-14.92	-0.83	-18.42
Confucian vs. East Catholic	-42.37	-21.65	-5.65	-27.38
Confucian vs. Orthodox	-58.18	-32.30	-11.75	-60.47
Protestant Europe vs. English-speaking	0.80	-13.24	-10.28	-3.65
Protestant Europe vs. West Catholic	-28.80	4.37	-14.94	-17.43
Protestant Europe vs. East Catholic	-39.25	-1.97	-22.60	-25.53
Protestant Europe vs. Orthodox	-47.27	-10.73	-26.58	-56.81
English-speaking vs. West Catholic	-26.60	20.85	-0.25	-11.20
English-speaking vs. East Catholic	-34.52	14.04	-4.19	-20.68
English-speaking vs. Orthodox	-43.24	7.02	-6.43	-38.03
West Catholic vs. East Catholic	-8.04	-6.59	-4.75	-7.02
West Catholic vs. Orthodox	-18.12	-16.70	-7.82	-27.77
East Catholic vs. Orthodox	-9.52	-9.72	-3.84	-18.60

Note . In Table A-1 all significant comparisons at the 0.01 level are highlighted.

SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006.

Table A-2

All Possible t-test Comparisons Among the Six Culture Zones for Outside School Reading Work Variables

	Outside School Reading Work Variables			
Culture Zone Comparisons	Read Aloud Outside School	Listen to Reading Outside School	Read for Information Outside School	Read for Fun Outside School
Confucian vs. Protestant Europe	-31.97	-12.76	7.03	-18.59
Confucian vs. English-speaking	-17.99	-17.93	-4.93	-11.00
Confucian vs. West Catholic	-25.42	-22.42	-21.11	-18.69
Confucian vs. East Catholic	-31.48	-23.99	-25.49	-19.06
Confucian vs. Orthodox	-45.71	-33.80	-33.86	-19.31
Protestant Europe vs. English-speaking	8.92	-5.31	-12.36	4.13
Protestant Europe vs. West Catholic	0.38	-5.89	-27.89	-3.05
Protestant Europe vs. East Catholic	-4.71	-9.32	-34.14	-3.22
Protestant Europe vs. Orthodox	-19.06	-19.07	-39.52	-1.50
English-speaking vs. West Catholic	-6.56	-1.53	-9.64	-6.94
English-speaking vs. East Catholic	-11.17	-4.87	-15.41	-6.34
English-speaking vs. Orthodox	-23.71	-15.47	-21.27	-5.48
West Catholic vs. East Catholic	-5.16	-3.36	-6.35	-0.03
West Catholic vs. Orthodox	-18.45	-11.28	-12.63	1.54

East Catholic vs. Orthodox	-12.99	-8.59	-6.24	1.69

Note . In Table A-2 all significant comparisons at the 0.01 level are highlighted.
SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006.

Table A-3
All Possible t-test Comparisons Among the Six Culture Zones for Homework Variables

	Homework Variables	
Culture Zone Comparisons	Reading for Homework Every day or almost every day	Reading Homework for more than One Hour
Confucian vs. Protestant Europe	-13.94	21.45
Confucian vs. English-speaking	-13.29	6.48
Confucian vs. West Catholic	-9.10	12.00
Confucian vs. East Catholic	-27.23	7.87
Confucian vs. Orthodox	-47.05	-30.38
Protestant Europe vs. English-speaking	-3.72	-10.97
Protestant Europe vs. West Catholic	1.14	-6.11
Protestant Europe vs. East Catholic	-10.93	-10.29
Protestant Europe vs. Orthodox	-26.68	-44.54
English-speaking vs. West Catholic	4.36	4.23
English-speaking vs. East Catholic	-5.15	0.12
English-speaking vs. Orthodox	-15.88	-32.70
West Catholic vs. East Catholic	-9.97	-4.30
West Catholic vs. Orthodox	-21.28	-36.01
East Catholic vs. Orthodox	-12.35	-32.65

Note . In Table A-3 all significant comparisons at the 0.01 level are highlighted.
SOURCE: Progress in International Reading Literacy Study (PIRLS) 2006.