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Student performance, school differentiation, and world cultures: Evidence from PISA 2009

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ABSTRACT

PISA 2009 data were used to identify patterns of differences and similarities among PISA participating countries/economies. The concept of cultural clusters was used to show patterns of differences and similarities within and across country clusters in two indicators – average student performance and school differentiations (measured by proportion of variance in student test scores explained by schools). Results revealed striking similarities among countries within many cultural clusters, while significant dispersion was found in others, especially among Eastern Europe countries. Regression analyses indicated that cultural clusters explain the majority of variance in average student performance and school differentiations across countries, suggesting that culture is an important factor when comparing and contrasting different school systems.

1. Introduction

International assessments and comparative research have often been conducted in tandem; on these occasions such studies have had varying goals at different points in history. The focus of such work has shifted from "knowing the other" in the 1880s, to "understanding the other" in the 1920s, to "constructing the other" in the 1960s, to "measuring the other" in recent decades (Nóvoa and Yariv-Mashal, 2003, p. 424). The era of measuring the "other" has been accelerated by the belief that the availability of a quality education gives countries a competitive edge in global economy. For these reasons, international assessments have sought to develop indicators to measure the "quality" and "efficiency" of educational systems across numerous countries on every continent (Nóvoa and Yariv-Mashal, 2003). Recent research in this area has been fueled by the availability of large-scale international assessments, including Progress in International Reading Literacy Study (PIRLS), Trends in International Mathematics and Science Study (TIMSS), and Programme for International Student Assessment (PISA), which provide student assessments in a large number of countries. The availability of these large data sets has enabled educational researchers to investigate, compare, and contrast national and international differences and similarities with regard to student performance.

Researchers have examined how countries differ, or how they are similar, and at the same time sought potential determinants of student achievement, nationally and internationally. One common feature of this body of literature is the use of student performance – i.e., student test scores in different subject areas – as the core dependent variable for comparing and contrasting national differences. In a few exceptions, achievement inequality, typically measured by variance or standard deviation, has been used (Ammermüller et al., 2005; Hanushek and Kimko, 2000; Hanushek and Wößmann, 2006, 2010; Lee and Barro, 2001; Wößmann, 2003, 2011; Wößmann and West, 2006). Besides individual (i.e., gender, age, race, immigration status, language) and family characteristics (i.e., socioeconomic status, educational expectation, cultural and academic resources), school and national level variables are also used to predict student performance. In general, national level variables do not explain student performance well. For example, Hanushek and Wößmann (2010) find that GDP and educational expenditure are not important predictors for student achievement. School level variables tend to have more important roles in affecting student performance. Besides usual suspects including school types (e.g., private versus public), class size, teacher qualifications, and educational resources, recent studies (e.g., Willms, 2006, 2010) find that student composition within schools is also correlated with student academic performance.

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This study attempted to extend research in this area in two important ways. First, while the growing body of literature on comparative education has used average student test scores as the key variable of interest, we explored how national systems differ in school inequality or differentiations. School differentiations reflect different school organizations across countries and provide the national contexts needed to access quality education for students. For example, it is well documented that some countries (e.g., Finland and Norway) have uniformly high-quality schools, while other countries (e.g., most Latin American countries) have a bifurcated, uneven system of private and public schools. By exploring both average student performance and school differentiations across countries, this study provided a more complete picture of differences among national school systems. Second, we borrowed from the literature on cultural clusters and cultural differences in other areas of study (e.g., management) to explain international differences in student performance and school differentiations. To that end, we attempted to bridge data from PISA 2009 with findings on cultural/societal clusters to examine similarities and differences in student performance and school differentiation across 65 PISA 2009 participating countries. Our inquiry was guided by two research questions: (1) What are the similarities and differences in student performance and school differentiations within and across cultures/societies? (2) To what extent do the cultural clusters explain differences in student performance and school differentiations across countries?

2. Cultural clusters

Anthropologists and sociologists have long been experimenting with groupings of countries based on cultural similarities and differences. As a result, a framework for cultural clustering of countries has evolved gradually and incrementally over time. Studies (e.g., Ashkanasy et al., 2002; Cattell, 1950; Hofstede, 1980; Chhokar et al., 2007; Haire et al., 1966; Ronen and Shenkar, 1985) have identified cultural clusters around the world wherein countries share similarities in patterns of collective behavior and attitudes along specific dimensions of group characteristics. These studies identify cultural nuances that give rise to the diversity of cultures across societies and countries.

A cultural cluster is a "distinct entity" (Ronen and Shenkar, 1985) consisting of an assemblage of nations or cultures that are alike within the cluster, sharing "syntality of the group" in Cattell's (1950) terms, more than any other nation or culture that is not a member of a given cluster (Javidan and House, 2002). One of the earliest references to the term "cluster" can be found in Cattell (1943), who categorized vocabulary on human personality and identified 171 terms that depicted personality traits and syndromes as they came from the field of psychology and dictionary uses of the terms. These traits were then clumped into 60 clusters based on a survey administered to 100 randomly selected individuals. Later on, Cattell (1950) applied the term "cluster" to coalesce country traits that he termed as "syntality" of a group as against "personality" of an individual. Borrowing the method from psychology, Cattell (1949, 1950) used factor analysis to identify common features among countries as well as features that put some countries apart from each other. He identified 10 groups of countries as "phenomenal clusters," in addition to some individual countries that were variously related to these clusters. These families of countries were named as the *Catholic Colonial Pattern, Eastern European, Mohammedan, East Baltic, Scandinavian Pattern, Oriental Pattern*, and so on and so forth. The baseline for his extensive characterization of countries into clusters and families was based on country factors such as size, cultural pressure versus direct expression of drives, enlightened affluence versus narrow poverty, and conservative patriarchal solidarity versus ferment of release.

The idea and process of clustering was taken to new heights of conceptual finesse when Hofstede published his most cited works on the subject in 1980. Prior to that, using evidence from a survey of middle-level managers from 15 countries, Hofstede (1976) coined five cultural clusters: Nordic, Germanic, Anglo, Latin, and Asian. Since then, numerous other works have followed including Hofstede's (2001) revised version of his 1980 book. Up until the middle of the 1980s, however, research on country clusters seemed to be a sporadic phenomenon. Different researchers came up with more or less similar cultural clusters (e.g., Haire et al., 1966; Sirota and Greenwood, 1971; Ronen and Kraut, 1977; Hofstede, 1976; Griffeth et al., 1980; Hofstede, 1980; Redding, 1976; Badawy, 1979) but an integrated view of the clusters remained wanting throughout. This apparent disjoint among studies was addressed by Ronen and Shenkar in 1985.

Ronen and Shenkar (1985) analyzed prominent studies on cultural clustering conducted over two decades between 60s and 80s and compiled nine clusters from these studies. The nine clusters included Anglo, Germanic, Nordic, Latin European, Latin American, Near East, Far East, Arabic, and Independents. This compilation of clusters differed from that of Hofstede (1980) only in one instance – the Arabic cluster that was not in Hofstede's eight clusters. Ronen and Shenkar's compilation showed that almost all studies classified various countries more or less into the same clusters with only slight variations, which could be attributed to use of different statistical techniques in these studies in addition to cultural nuances that run across countries in a very subtle fashion. Furthermore, as Ronen and Shenkar (1985) note, an African cluster was altogether missing in these studies. Many countries in the Independent cluster could have been included in one or the other of the eight clusters but this did not happen since the studies that Ronen and Shenkar analyzed could not find a common ground to include the "independent" countries in any of the other clusters. The clusters also had Confucian countries, one of the prominent cultural categories of countries, missing in the compiled list of clusters. Many of these issues have been resolved in the Global Leadership and Organizational Behavior Effectiveness (GLOBE) project.

GLOBE is the most recent mega project on cultural clustering that aimed at developing a comprehensive framework to explain the effects of cultural variables on leadership and organizations across countries and cultures (House et al., 2002). This project was vast in its scope involving 150 scholars and scientists representing 61 cultures around the world. Findings from various studies that were part of the project categorized cultures into ten clusters with evidence coming from studies in 62 countries (e.g., Ashkanasy et al., 2002; Bakacsi et al., 2002; Chhokar et al., 2007; Gupta et al., 2002; House et al., 2004). The new list contained three new clusters – Sub-Saharan Africa, South Asia and Confucian Asia – which were henceforth had not been proposed in any of the previous studies. All ten cultural clusters were operationalized using quantitative measures on nine cultural dimensions, some of which came from Hofstede's five dimensions described above. These dimensions are: performance orientation, uncertainty avoidance, humane orientation, institutional collectivism, in-group collectivism, assertiveness, gender egalitarianism, future orientation, and power distance. The 10 cultural clusters that resulted from the GLOBE project and their member countries are presented in Table 1.

GLOBE project, with its extensive coverage of a greater number of cultures from around the world fine tunes characterization and grouping of countries and cultures and thereby presents the most advanced version of clustering in the long line of research on the subject that dates back to the middle of the 20th century. The