



Equity in opportunity-to-learn and achievement in reading: A secondary analysis of PISA 2009 data



Dominique Lafontaine^{a,*}, A. Baye^a, S. Vieluf^b, C. Monseur^a

^a Department of Education, University of Liège, Boulevard du Rectorat, 5, B32, 4000 Liège, Belgium

^b German Institute for International Education Research (DIPF), Schloßstraße, 29, 60486 Frankfurt am Main, Germany

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ABSTRACT

Using data from PISA 2009, the present study investigates firstly how equally students are exposed to opportunities to improve their reading skills (OTL) depending on the school they are enrolled in, and secondly the links between OTL in reading and achievement at the school level. A multidimensional within-item IRT is used to model the OTL. The intraclass correlation of both OTL dimensions issued from the IRT analysis – *reading fiction* and *reading non-continuous tasks* – is high, especially in differentiated education systems, showing an unequal exposure to OTL in reading according to the school. Robust correlations between the two OTL dimensions and reading achievement are observed at the school level. In addition, the results of a multilevel regression analysis show that a substantial proportion of the between-school variance in reading can be explained by OTL and by the school social intake. The proportion of between-school variance explained jointly by OTL and social intake is higher in differentiated education systems than in comprehensive ones.

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Introduction

To what extent are 15-year-old students given equal opportunities to enhance their reading literacy, regardless of the school they are enrolled in? Do some education systems provide their students in secondary education with more equal opportunities to learn in reading?

The concept of opportunity-to-learn (OTL) refers to a fundamental instructional process: “what students learn in school is related to what is taught in school” (Schmidt & Maier, 2009, p. 541). Among the malleable variables that policy-makers may want to use to improve their education policies, opportunity-to-learn is known to be one that shows a constant positive association with achievement (Muthén et al., 1995; Schmidt & Maier, 2009; Wang, 1998). A number of international comparative studies have extensively assessed the association of OTL variables with student scores, mainly in mathematics and science. Fewer studies have explored OTL in domains such as reading and writing, and most of them were about primary education (Grisay, 2008; Leinhardt, Zigmond, & Cooley, 1981; Lundberg, 1994; Martinez, 2012). This research gap exists, even

though cross-country and within-country variation exists in most instructional practices implemented in schools to teach the students the language of instruction. For instance, variation may exist in the amount of time that students spend reading literature or other kinds of texts – whether retrieving names, facts or simple information from text or developing more cognitively challenging skills such as relating parts of the text to one another, evaluating the form and content of the text or taking a critical stance. Within countries, the amount and nature of the reading tasks assigned to students may vary from school to school and from class to class, due to possible differences in local curricula and/or study programs. This is especially true in differentiated education systems, where teachers are likely to teach more challenging skills such as the analysis of poetry and literary texts to students enrolled in academic programs, while less demanding skills – e.g. locating information in functional, work-related texts – tend to be emphasized for students enrolled in vocational tracks.

To address the issue of the equitable exposure to OTL in reading in a broad set of countries, data from the PISA 2009 study were used for secondary analyses. PISA – the Program for International Student Assessment – is a large international comparative study aimed at assessing the reading, mathematical and scientific literacy of 15-year-old students in OECD and partner countries every 3 years (for more details, see <http://www.pisa.OECD.org>).

* Corresponding author. Tel.: +32 4 366 20 97; fax: +32 43662855.
E-mail address: dlafontaine@ulg.ac.be (D. Lafontaine).

State of the art

The OTL concept

The concept of opportunity-to-learn was first introduced by J. B. Carroll in the early 1960s. Carroll viewed OTL mainly as a measure of content exposure (allocated learning time), but OTL also refers to content coverage or content emphasis – which topics are selected for more emphasis, e.g. higher- or lower-order skills (Stevens, 1993; Wang, 1998). The development of OTL measures is closely linked with the first IEA comparative studies, assessing mathematics (FIMS, 1965) and science (FISS, 1971) (Floden, 2002; Schmidt & Maier, 2009; Schmidt & McKnight, 1995). Results from these studies provide evidence for variation in students' exposure to the curriculum, which can account for differences in achievement between and within countries.

How OTL in reading is measured in cross-cultural contexts

As reading is not taught as a specific subject, especially in secondary education, measuring OTL is not as straightforward as it is for mathematics, for instance. One approach is to try to capture how similar the reading material and the kind of questions in the reading test (e.g. PISA or PIRLS) are to the reading assessments usually taken by students in their courses; this approach is close to the notion of content coverage. Another approach aims at identifying to what extent students have had the opportunities to learn the kind of reading strategies or processes necessary to answer the questions in the test; this approach is closer to the notions of content exposure and content emphasis.

In IEA-RLS (1991) and PIRLS (2001, 2006, 2011), teachers were asked about various aspects of OTL and instruction in reading, including reading material, teaching strategies and types of responses to the text (oral, written, quiz). Likert scales were used to measure frequency of use, exposure or emphasis. It is nowadays well established that Likert scales are especially sensitive to response style biases (e.g. Harzing et al., 2009; Kyllonen & Bertling, 2014; Rocereto, Puzakova, Anderson, & Kwak, 2011; Yang, Harkness, Chin, & Villar, 2010). Response styles can be defined as a systematic tendency to respond to items on a basis other than what the items were designed to measure; examples are acquiescence, disacquiescence, social desirability, extremity scoring or midpoint responding. Differences in response styles are not only observed between individuals, but also between cultures. For example a stronger tendency to use the intermediate levels of response scales in East Asian as compared to Western countries, in which it is more common to use the extreme points of Likert scales, has been reported by several studies (Johnson, Kulesa, Cho, & Shavitt, 2005; for a critical overview, see Yang et al., 2010). These systematic differences in response styles can lead to misinterpretations of comparisons of cultures based on Likert scales, because observed differences may reflect cultural response tendencies rather than substantial differences. They may also be one explanation for the *attitude-achievement paradox*, that is, negative country-level correlations of attitudinal constructs with student achievement, in spite of positive within-country correlations (Buckley, 2009; Van de Gaer, Grisay, Schultz, & Gebhardt, 2012).

OTL and equity

When examining the equality of education systems, Sen's question immediately comes to mind: "Equality of what?" (Sen, 1992). Equality is not a unique concept, since several principles of equality coexist (equality of opportunities, equality of

treatment, equality of achievement or equality of social outputs) and compete with one another (EGREES, 2005; Grisay, 1984). For instance, if equality of achievement is a goal, equality of treatment may be challenged and overturned, since strict equality of treatment may reinforce social inequalities (Dubet, 2010; Duru-Bellat, 2009; Felouzis, 2014). The concept of equity is necessary for making choices between competing principles of equality. Unlike the principle of equality, the concept of equity refers to a normative principle, a principle of justice according to which some types of inequalities are judged as fair, and others not (EGREES, 2005). Equity is a matter of justice and different theories of justice may be used to judge the fairness of education systems. For instance, Rawls' (1971) theory stipulates that, under control of certain liberties, education should foster a "fair equality of social opportunities". Other inequalities in education, in particular inequalities in knowledge and skills between more and less privileged students, should benefit to the latter (Meuret, 1999).

Regarding OTL, strict equality of treatment may be seen as fair: from a meritocratic point of view, each student may then take advantage of the opportunities offered, and is responsible for the development of his/her own skills, provided that the same curriculum is offered. Another way to judge the equity of distribution of OTL is to take the view that some students must be provided with more of the same OTL (according to a compensatory principle) or with different OTL (adaptivity: a curriculum tailored to individual/local needs in order to reach the same achievement standards).

Despite different views, most of the theoreticians of justice, from supporters of meritocracy to egalitarianism, would agree on one point: it hurts the idea of educational justice if OTL distribution depends on the students' socioeconomic and cultural status and if less beneficial OTL is offered to less privileged students, while more privileged students are exposed to more challenging content or goals.

For the present study, we will consider as more equitable these education systems with smaller variance between schools in OTL and where schools' social intake is not linked or is even negatively linked to OTL; the latter case (negative correlation) would reflect a policy of compensating for poor or underprivileged socioeconomic background by providing more or better OTL to disadvantaged pupils.

Since the beginning, OTL measures have been related to equity issues in the IEA studies: "Although implicit in the IEA researchers' conceptualization of OTL was a belief that students should not be assessed on knowledge they had not been given an opportunity to learn" (McDonnell, 1995, p. 306).

The link between OTL measures and equity became more explicit in the early 1990s, when OTL was addressed in policy debates on educational standards in the U.S. (Guiton & Oakes, 1995; McDonnell, 1995). In this context, it was assumed that "if schools are to be held accountable for the equitable delivery of educational opportunities, the core of educational performance includes school and classroom process information" (Wang, 1998, p. 137).

Beyond this debate, there is long-standing evidence that within countries, pronounced inequalities can be found in the way students are taught or exposed to the curriculum, especially in secondary education. "Learning experiences are not only different for students from different SES families, they are also different for students in different ability or track classrooms" (Wang, 1998, p. 138). Low-ability students, students attending vocational programs, or schools with an underprivileged social intake are exposed to an impoverished curriculum, both from a quantitative and a qualitative point of view (Hattie, 2009; Oakes, Gamoran, & Page, 1992).

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