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Performance in a Cross-Comparative  
Perspective:  
Effects of School's Resources and Family  
Policies of Modern Societies**

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# **Family Forms and Children's Educational Performance in a Cross-Comparative Perspective: Effects of School's Resources and Family Policies of Modern Societies**

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## **ABSTRACT**

Growing up in a disrupted family negatively affects children's educational performance, mainly due to a lack of the amount of family's financial, cultural and social resources. In this paper, we aim to find out to what extent both characteristics of schools and countries can compensate for these negative effects of growing up in a disrupted family, compared to a two-parent family. We use pooled data from the Organisation for Economic Co-operation and Development (OECD), i.e. the Programme for International Student Assessment (PISA) 2000 and 2003, which contains information on 196,118 students at 3,725 schools in 25 countries. We found that attending a school with more children from single-parent families affects the educational performance of all children negatively, but, children from single-mother families are particularly harmed by attending such schools. Also in countries in which the number of disrupted families is higher, children growing up with only a mother perform worse at school. However, we found that the negative effect of growing up with a single mother is reduced in countries with ample policies concerning the support of families through childcare. Moreover, the negative consequences of growing up in a disrupted family are larger in countries with ample social security facilities.

## INTRODUCTION

Families fulfill an important function in every society: most of the children in developed countries grow up in a family, which is responsible for teaching them norms and values that are essential in life. Family forms the context in which a child develops by adopting social behavior and its first attitudes. Generally, it provides the child with opportunities to develop into a stable and independent person, for example through enabling the child to attend school. The future success of children thus greatly depends on the household they grow up in. Nevertheless, a child is not in the position to choose its own family and has to accept it if its family is not capable of offering the best opportunities.

Traditionally, the word 'family' referred to a married couple with one or more children. Within this family, father usually had to work to earn his bread, while mother stayed at home to run the household and to take care of the children. This portrait of a family, also referred to as the traditional male breadwinner model (McDonald 1997; Lewis 2001), prevailed during the 1950s. At that time it was very common for young people to marry early and to have many children quickly (Martin and Kats 2003). Moreover, people hardly ever divorced, cohabitated or had children outside marriage. As a result, single parenthood was quite rare and in most cases it followed after the death of one of both parents. Although nowadays many households still fit the description of the male-breadwinner female-homemaker family, family structures have changed enormously during the later decades of the 20th century with the introduction of some new family forms (Martin and Kats 2003). To a large extent, this change comes down to the fact that the universal two-parent families have made way for more single-parent families.

This trend in family structures coincides with changes in other demographic aspects that occurred from the 1960s till the late 1980s in developed countries: i.e. fertility rates dropped off, marriage rates decreased, and both divorce rates and the number of births to unmarried women increased (Sorrentino 1990; Lesthaeghe 1994). Together, these demographic trends are also known as the 'Second Demographic Transition' and they directly contributed to the rise of new family forms, especially to the rise of single-parent families. This implies not only a growing number of mother-headed households, but also that more and more father-headed families exist nowadays.

As a result of the growing number of divorces, decreasing marriage rates and increasing number of births outside marriage, every year many children are confronted with the negative effects of single parenthood, such as economic deprivation, a decrease in the quality and quantity of parental contact and a decline in parental

support and effective control (Amato and Keith 1991; Amato 2000). Not only divorce itself and the period following it have negative consequences for children, but already prior to divorce such families are often characterized by a smaller amount of financial resources and more conflicts (Fischer and de Graaf 2001). Obviously, this has a detrimental effect on children's well-being and development, and, accordingly, on their performance at school.

In this paper, we study the negative consequences of divorce by focusing on the educational performance of children from disrupted families. Education is worldwide acknowledged as one of the basic needs in people's life in order to be successful. Obviously, it is extremely important for children to do well at school. Previous research has already shown that children's educational achievement is negatively affected by parental divorce (Bosman and Louwes 1989; Dronkers 1992; McLanahan & Sandefur, 1994; Bukodi & Dronkers, 2003). In brief, this effect comes down to the fact that the loss of one parent from the family, which can be interpreted as a decrease in the number of family's financial, cultural and social resources, leads to a deterioration of children's educational achievement. However, most of prior research has solely concentrated on the family context when studying the consequences of divorce. In addition, most of this research has focused on just one country. This research aims to improve on previous studies by investigating the effect of growing up in a disrupted family from a comparative perspective: i.e. we study both the effect of the school context and the national context on the relationship between family structures and children's educational performance in 25 industrialized countries. The research question that we address is the following: To what extent can characteristics of schools and countries compensate for the negative effects of growing up in a disrupted family compared to a two-parent family on children's educational performance and how?

We start by examining how the negative effect of growing up in a disrupted family varies across schools. Even though a child lives with his family and, as a consequence, spends a lot of time with his parents – especially when it is young – the family context is not the only context a child is surrounded by: a large part of the day a child spends at school. As a result, the child will also be affected by school characteristics, like the school's composition of teachers and students. Previous research showed that the number of single parents at a school negatively influences the achievement of its pupils (Pong 1998). This effect was partly explained in terms of the school's socio-economic status and social capital in the form of parental involvement.

In addition to variation between schools, we investigate differences in the effect of growing up in a disrupted family on educational performance across

countries. The number of studies that adopted a cross-national approach, which is needed in order to understand the relative importance of public (family) policies, is scarce. From the few studies that have actually done this (Pong, Dronkers and Hampden-Thompson 2003; Garib, Martin Garcia and Dronkers 2007), it appeared that single-parenthood is less detrimental in countries in which family policies equalize resources between single- and two-parent families. However, the achievement gap between children from single- and two-parent families is greater in countries that are characterized by more disrupted families. The role of family policies and demographic characteristics in decreasing (or increasing) the negative effect of single-parenthood for children's educational achievement is further investigated in this research.

We use pooled data from 25 industrialized countries on students' educational performance, as collected by the Organisation for Economic Co-operation and Development (OECD), i.e. the Programme for International Student Assessment (PISA) 2000 and 2003. Analyzing the effect of family form on children's educational performance using this large-scale survey is unique and the considerable cross-national variation offers the opportunity to include important country-level characteristics in the analysis. Through cross-level interactions between family form and characteristics at the school and country level, we can investigate the variation across schools and countries in the effect of family form on children's educational performance. Our multilevel research design hence includes three levels, i.e. the student, school and country level, and, in this manner adopts a more comprehensive approach than previous studies did. In addition to the methodological progress that we achieve by using this research design, our approach is of societal relevance as we investigate how certain contexts (i.e. school and country) make the impact of growing up in a disrupted family on educational performance less severe.

## **THEORETICAL FRAMEWORK AND HYPOTHESES**

In order to adequately examine how the negative consequences of growing up in a disrupted family can be counterbalanced by the school and/or the country, we first elaborate on the reason why children from disrupted families perform worse at school than children from two-parent families, i.e. the decrease in the amount of the family's financial, cultural and social resources. Subsequently, we discuss how school's resources may affect the relationship between family form and children's educational performance, and, finally, we elaborate on the influence of national (family) policies on this relationship.

### ***Family Form and Educational Success***

McLanahan and Sandefur (1994) give an extensive description of the three types of resources (i.e. financial, cultural and social) that are important in explaining the impact of growing up with a single parent on children's chances of future success. First of all, they underline the importance of financial resources and the loss of income that generally goes together with family disruption. In short, this is due to the fact that from that moment two households need to be supported instead of only one and thus a lot of household expenses cannot be shared any longer, which is also called a loss of economies of scale. The most direct effect of this loss of income on educational performance of children is the fact that the quality of the school they attend generally is lower. The higher the income of parents, the more possibilities they have to live in neighborhoods with good public schools or to send their children to a private school of their preference. Income can also affect school outcomes through enabling a child to participate in extracurricular activities, like lessons after school, special trips or summer camps. Such activities improve children's skills directly, but also indirectly via general intellectual stimulation, which affects subsequent learning.

Not only a loss of financial resources, but also a loss of cultural resources is generally associated with divorce or separation. McLanahan & Sandefur (1994) refer to this as a loss of parental resources. This type of capital mainly comprehends the time that parents spend with their children on reading, helping with their homework, or by listening to the stories about their experiences at school. Moreover, parental resources refer to the willingness and ability of parents to monitor and supervise children's social activities outside school, which reduces their opportunities to get in trouble. After a divorce or separation, the quality of parenting is lower in a one-parent family than in a two-parent family. For instance, the remaining parent is likely to experience high levels of stress and anxiety after the disruption and to fulfill two parenting roles simultaneously. Moreover, the parents in a one-parent family cannot 'control' and correct each other's parenting styles, which makes it less sure whether the remaining parent is behaving in appropriate ways. As a result of this loss of parental resources, children from disrupted families will perform worse at school.

The third and last type of resources that decreases after a divorce or separation, i.e. social resources, is described by McLanahan and Sandefur (1994) as the loss of community resources. This loss represents two things: first, it implies the fact that one-parent families are restricted to live in neighborhoods where the level of resources is lower, as a result of their reduced income. Second, it involves the fact that the connection of children to the community they are living in reduces after a divorce or separation. Strong community connections provide a child with social capital in the form of emotional support and information about the broader community. However, a

divorce or separation often involves moving from one town to another or from one neighborhood to the other, which undermines or destroys the community ties. Even when a family does not move after a divorce, single parents may not find the time or energy to keep investing in personal relationships, because of stress or depression, and, consequently, lose friends without making new ones. As a result, single-parent families have less information about which teachers are good and which are not, for instance, and they are less familiar with extracurricular activities.

### ***School Effects and the Relationship between Family Form and Educational Success***

Concerning the school level effects, we expect that schools can mainly function as a ‘substitute’ for cultural or social resources to children of disrupted families, whose parents may not have the opportunity to do this well. Pong (1997; 1998) already examined the effect of social relations among parents on children’s educational performance by studying the school context of children. According to Pong (1997) parental influence on children extends beyond their own child and reaches the communities in which they live and the schools belonging to these communities. As previous research has shown, the type of student attending the school appears to be one of the most important factors influencing the effectiveness of the school (Pong 1997; Pong 1998). In this respect, divorce might play a part in determining children’s educational performance, i.e. at the school level. As explained above, the demographic changes that occurred from the 1960s till the late 1980s have resulted in a rise of new family forms, particularly in an increase in the number of single-parent families (and stepfamilies). This increase implies that more children attend schools where a large part or even the majority of the students is from single-parent families or stepfamilies. Pong (1997; 1998) and Sun (1999) both argue that family disruption has a negative contextual effect on children’s academic achievement: schools with a large concentration of single-parent families are usually characterized by less social relations between the parents so that children’s educational performance is negatively affected, compared to the educational performance of children from schools with a smaller concentration of disrupted families. This leads to the hypothesis that *children from schools with a large concentration of students from single-parent families will perform less well than children from schools with a small concentration of students from single-parent families, independently of the family form they grow up in* (H1).

Pong (1997) moreover argues that the effect of the school’s composition of children from disrupted families on academic achievement can be explained by two factors, derived from the individual-level perspective on family structure, i.e. the lower amount of cultural and social resources at schools with a higher number of

children from disrupted families.<sup>1</sup> More specifically, the first explanation involves that schools predominantly attended by students from single-parent families and stepfamilies are, on average, likely to be characterized by a lower socio-economic status. This is because single-parent families are usually poorer than two-parent families. They also more often live in neighborhoods with a low socio-economic status, where schools are poorly financed and have fewer physical resources for learning, such as computers (Pong 1997). It can be expected that teachers and administrators in such school environments have lower morale and are likely to hold lower expectations for the students. As a consequence, low socio-economic status schools have fewer cultural resources and, therefore, produce students with lower educational performance. The next hypothesis, consequently, is that *the negative effect of schools with a large concentration of students from single-parent families can be explained by the smaller amount of cultural resources in such schools* (H2a).

Children from disrupted families would be better off at schools without many other children also growing up in single-parent or stepfamilies, apparently. Instead of being negatively affected by the smaller amount of cultural resources in schools with a

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<sup>1</sup> The single parent composition of the student population influences the level of educational performance also in another way, i.e. through the amount of actual teaching time for teachers and actual learning time for students. Learning and teaching time can be greatly diminished in schools where children have problems inside or outside the home that interrupt the teaching and learning process. Children of divorced parents have on average more emotional and other problems related to their parents' divorce (due to a lack of parental time and energy devoted to the socialization of the children, because the divorce and its often long-lasting after march requires that time and energy). If that are more than just a few pupils in a class with such problems related to their parental divorce, learning and teaching time of the whole class will be used for non-academic goals. In such situations with a higher percentage of single parents' children, there is less learning and teaching time available than necessary to reach a certain educational performance. Although we consider this additional explanation for the negative effect of the number of children from disrupted families at school to be important, it is not the focus of our paper.

high concentration of children from disrupted families, they could profit from the higher socio-economic status of schools with many children from two-parent families, which will have more cultural resources. As we assume that especially children who lack cultural resources will be supported by the existence of such resources at school, we expect that children from disrupted families will profit more from the school's cultural capital than children from two-parent families, who might already have a sufficient amount of family resources at their disposal and therefore make less use of school's cultural capital. This assumption implies that schools would be able to (partially) compensate for the negative effects of divorce on children's educational performance. In other words: *the negative effect of growing up in a disrupted family on educational performance is less strong for children at schools with more cultural resources compared to children at schools with less cultural resources* (H2b).

The second explanation for the negative (contextual) effect of a school's proportion of single-parent families on children's educational performance is that these schools may allow very limited social relations (Pong 1997). It is likely that in schools with a high concentration of single-parent and frequently moving families, fewer parents have time to participate in school- or community related activities. Consequently, in such schools parents know each other less well and are not able to share human resources. Moreover, it is likely that children receive limited social support and supervision from other parents in such communities (Pong 1998). Although, so far, not much research has been dedicated to the effect of social capital outside the family on children's school achievement, several studies have focused on the potential contextual effect of social capital accumulated within a residential neighborhood or a school community on the educational performance of all students living in the community (Caldas and Bankston 1997; Sun 1999; Sirin 2005). The overall conclusion drawn from these studies is that both the community's and the school's amount of social capital is positively related to educational performance, even after controlling for the family's social capital and demographic factors. School's social capital functions as an alternative source of the human resources a child needs to develop itself as children are exposed to an extensive range of adult social support and control in school communities with strong networks.

Coleman and Hoffer (1987) also investigated the role of school's social capital on children's educational performance and concluded that the amount of social capital at school, i.e. the web of social networks and relationships, explains why academic performance is better in Catholic schools than in public schools. According to these authors, Catholic schools benefit from larger amounts of social capital, generated in part through greater intergenerational social closure (i.e. dense network connections between the parents of students). It is argued that when the parents of a group of

students all know each other – which is more often the case in Catholic schools or other private schools compared to public schools – valuable social capital resources accumulate in the ties among them that can promote student learning (Morgan and Sørensen 1999). For instance, parents establish ties with the parents of their children's school friends in order to effectively monitor the behavior of their children outside the school and to exchange information. Based on the previous studies described above, we expect that children from single-parent families are better off if they attend schools with a small proportion of students from disrupted families, compared to children at schools with a large number of children from single-parent families, as they have more social capital at their disposal. This is summarized in the next hypothesis: *The negative effect of schools with a large concentration of students from single-parent families can be explained by the lower level of parents' social relations in such schools* (H3a).

As Sun (1999) argues, the effect of community's or school's social capital is additional to the effect of family's social capital. This implies that children from single-parent families will also profit from the existence of social capital at the school level. However, in accordance with H2b it is to be expected that children who lack parental and social resources in their family (i.e. children from disrupted families), will profit relatively more from the school's social capital than children from two-parent families, who might already have enough social resources at their disposal and therefore make less use of the school's social capital. Schools may compensate for the negative effects of divorce on children's educational performance also in this way. Therefore, we expect that *the negative effect of growing up in a disrupted family on educational performance is less strong for children at schools with more social resources compared to children at schools with less social resources* (H3b).

### ***Country Effects and the Relationship between Family Form and Educational Success***

Previous research has often focused on the relationship between family form and children's educational performance within single countries. However, researchers have quite recently started to acknowledge that single parenthood has different implications in varying countries and this might subsequently result in cross-national differences in the consequences of single parenthood (Pong, Dronkers & Hampden-Thompson 2003).

The explanation for the different meaning of single parenthood across countries can be sought in the sphere of public policy. Pong, Dronkers and Hampden-Thompson (2003) found that family policies and the demographic structure of a country do account for differences in educational performance between children from different family forms in various countries. Also Garib, Martin Garcia and Dronkers

(2007) claim that national family policies combined with less of a laissez-faire policy towards the formation of single-parent families can diminish the negative educational outcomes of single-motherhood. It seems acceptable, thus, to assume that countries differ in their policies concerning families, which subsequently affects children's educational performance. As a result, the effects of family form on academic achievement should be studied from a cross-national perspective that takes account of the relative importance of public policy, which may mitigate or exacerbate the challenges associated with living with a single parent. For this reason, we focus on various public policies that might explain differences in the effect of family form on children's educational performance between countries.

The first kind of family policy concerns the financial support families may receive from the government as compensation for the high costs that are associated with having children (European Commission 2000). Examples of such policies are the payment of child benefits or family allowances, or granting tax allowances. Countries differ in the existence of such policies, as they might be absent in some countries while they are present in others. Furthermore, countries differ in the size of the benefits or allowances for families with children. As a result, in some countries single-parent families receive more money to compensate for the lack of economic resources than such families in other countries and they can hence invest more money in the education of their child(ren). Subsequently, this will result in better educational performance of their children compared to children from single-parent families growing up in countries that pay less money. Thus, we expect that *children from disrupted families growing up in countries with ample policies concerning the additional costs of having children will perform better at school than children from disrupted families in countries in which such policies are limited* (H4).

In addition to policies aiming at compensation of the high costs of raising children, policies that are not specially designed for people who have children can contribute positively to children's educational performance (European Commission 2000). In countries with more extended social welfare legislation, non-participating people in the labor market (both unemployed and inactive, and with or without children) will receive more financial support from the government. Accordingly, single parents have more opportunities to stay at home with the children in countries where social security benefits are higher. The time that otherwise had to be spent on work can now be devoted to the child(ren) in such countries. More parental involvement will subsequently result in higher educational performance of the children. In brief, we hypothesize that *children from disrupted families growing up in countries with ample social security facilities will perform better at school than children from disrupted families in countries in which such facilities are limited* (H5).

Although the first kinds of policies we discussed mainly focus on (single) parents without a job, a number of single parents will be employed and consequently cannot stay with their children day in, day out. For such parents it is important to live in a country with better facilities concerning childcare. Children from single parents who go to out-of-school care, where they receive help with doing their homework, for instance, will perform better at school than children who go home after school and are not encouraged to do their schoolwork. Obviously, childcare is only provided to young children and not to children attending secondary school. However, even though we study older children, who most likely do not go to child care at the moment of the research, the child care they had in their childhood will also positively influence their educational performance at an older age. However, countries will differ in the quantity and in the quality of such out-of-school care, which will result in differences in the relationship between family form (growing up with a single parent) and children's educational performance. In other words, we expect that *children from disrupted families growing up in countries with ample child care facilities will perform better at school than children from disrupted families in countries in which such facilities are limited* (H6).

Finally, we distinguish a fourth kind of policy that could affect the relationship between family form and children's educational performance. This involves the measures countries can take to encourage people to start working, which leads to an increase in family income. For instance, governments can improve incentives to work by enforcing requirements to look for work, by investments in quality education and training, and by ensuring that the labor market is dynamic with respect to job growth. Employment of single parents in such countries will have an indirect and positive effect on children's educational performance, through the increase in the amount of financial resources in the family. Thus, our last hypothesis is that *children from disrupted families growing up in countries with ample policies concerning the promotion of labor market participation will perform better at school than children from disrupted families in countries in which such policies are weaker* (H7).

## **METHODS**

### ***Data***

For the test of our hypotheses, we make use of data from the Programme for International Student Assessment (PISA). PISA is a collaborative effort among countries that are member of the Organisation for Economic Co-Operation and Development (OECD) and it assesses how far students near the end of compulsory

education (at age 15) have acquired some of the knowledge and skills that are essential for full participation in society (OECD 2002). Therefore, the main purpose of PISA is not to measure the extent to which students have mastered a specific school curriculum, but rather to examine to what degree they are able to apply their knowledge and skills to meet challenges in real life. The PISA survey was first conducted in 2000 and is repeated every three years. In 2000, 43 countries participated in the survey, in 2003, the survey was conducted in 41 countries, and in 2006, 57 countries were included in the survey. Due to changes in the inclusion of some relevant background characteristics in the 2006 survey, for instance the measurement of the specific family form a student grows up in – which is an essential variable in our research – the PISA 2006 survey data could not be included. Therefore, we only make use of the pooled PISA data of 2000 and 2003.

To select the countries for comparison, we first added country-level characteristics for as many countries as possible (collected by the OECD) to the existing data. More information about the application of these contextual characteristics is found below. Subsequently, we made a selection of the countries that had a valid score on all the country-level characteristics. This resulted in a total of 25 countries that remained and could be included in the analysis, i.e.: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, the United Kingdom and the United States. We want to emphasize that we do not consider this selection of countries to be representative of (a specific part of) the world, but we selected the largest number of countries as possible, with regard to the added country-level characteristics. Nevertheless, the selected countries differ substantially in their combinations of the relevant institutional aspects under investigation. Together, the 25 countries represent 196,118 students attending 3,725 different schools.

### ***Variables***

An overview of the descriptive statistics of the variables used in the empirical analysis is presented in Table 1.

TABLE 1 ABOUT HERE

**Dependent Variables** To measure the student's educational performance we use reading literacy and mathematical literacy as the dependent variables in our study. Reading literacy is defined in PISA as 'the ability to understand, use and reflect on written texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate effectively in society' (OECD 2003a). In order to measure

the student's reading proficiency, different tasks have been designed, which can be organized into five levels of increasing proficiency. Furthermore, the scales represent three major aspects or purposes of reading, which are: retrieving information from a variety of reading materials, interpreting what is read and reflecting upon and evaluating what is read. Mathematical literacy is defined as: 'the capacity to identify, understand and engage in mathematics as well as to make well-founded judgments about the role that mathematics plays in an individual's current and future life as a constructive, concerned and reflective citizen'. Mathematical literacy could be divided into four concepts, i.e. quantity, space and shape, change and relationships, and uncertainty (OECD 2003b). For both dependent variables, the observed item responses have been used to construct five plausible reading values for each student by means of Item Response Modeling. Plausible values are not test scores, but random numbers drawn from a distribution of scores that could be reasonably assigned to each individual (OECD 2000). They provide an unbiased estimate of the answers on all reading literacy items. For both reading and mathematics we calculated the mean score on the five plausible reading values as the dependent variables 'Reading Literacy' and 'Mathematical Literacy'.

**Predictor Variables** *Family Form* is measured by asking who usually lives at home with the student, i.e. a mother, female guardian, father, male guardian or others. We created dummy variables indicating a two-parent family (biological mother and father) (81%), a single-mother family (13%) and a family consisting of a mother plus guardian (6%). We have chosen to exclude other family forms as they were not very common in our dataset.

Unfortunately, we have no direct measures of the amount of financial, cultural and social resources available in a family, but, in order to approximate the amount of these resources, we included two important family background characteristics of students that are highly connected to the amount of resources in a family. *Parental Occupational Status* is measured according to the International Socio-economic Index of Occupational Status (ISEI) (Ganzeboom et al. 1992). For every child living in a family with two parents (either biological parents or stepparents, or a combination of both) we used the score of the parent with the highest occupational status. In case of a single parent family, we used the score of the single parent. The ISEI-scale initially contained scores from 16 to 90, which we recoded into a scale ranging from 0 to 1. *Parental Educational Level* is measured according to the International Standard Classification of Education (ISCED) (United Nations Educational, Scientific, and Cultural Organization 1997). We used the highest level of education if families consisted of two parents (biological parents or stepparents) and the score of the single

parent in case one of the parents was absent. Moreover, this variable is transformed into dummy variables indicating lower secondary education at most (11%), higher secondary education (38%) and tertiary education (51%).

We used answers to the questions what mother and/or father are currently doing, in order to measure the time parents usually spend on work, i.e. *Parental Working Hours*. In two-parent families we calculated the minimum number of working hours of both parents, as it is an indication of the time that parents can spend at home with their children, instead of spending on work. This variable is transformed into dummy variables, i.e. non-working (29%), part-time job (20 hours) (23%) and fulltime job (40 hours) (48%).

At the school level, we calculated the *Percentage of Children from Single-Parent Families* by counting all students at a certain school with a single mother or father, compared to the total number of students at school. Subsequently, we transformed this variable into a variable ranging from 0 to 1, after which we mean-centered this variable. This way, a scale remains ranging from -0.18 to 0.82. *School's Socio-Economic Status* is measured by computing the average parental occupational status of all the children at school, who participated in PISA. This variable originally ranged from 16 to 90, but it is transformed into a 0-1 scale and mean-centered. Finally, we use *Type of School* (i.e. public, private or unknown<sup>2</sup>) as a measurement of the social relations within a school, as it was hypothesized that more social relations exist in private schools, compared to public schools.

At the country level we calculated the *Percentage of Children from Disrupted Families* by counting all children in a country growing up in a family other than a two-parent family. We transformed this variable into a variable ranging from 0 to 1, after which we mean-centered it. Finally, we included indicators of the policy measures that we examine at the country level, which are all collected by the OECD. These indicators are measurements of family policies around the year 2000 or 2003, range from 0-1 and are mean-centered. First of all, family support through economic assistance, i.e. policies concerning the additional costs of having children, is measured as *Public Spending on Family Benefits* (in percentage of GDP). It includes child allowances with payment levels that in some countries vary with the age of the child and sometimes are income tested, public income support payments during periods of parental leave, income support for sole parents families (in some countries) and public child care support through assigned payments to parents (OECD Family Database 2008). We measured *Social Security Facilities* as all cash expenditures to people compensating for unemployment. This variable includes redundancy payments out of

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<sup>2</sup> The unknown category appeared to represent all schools in France.

public resources (OECD 2007). Family support through childcare facilities is measured by the *Public Spending on Child Care*, which includes all public financial support (in cash) for families with children participating in formal day-care services (e.g. crèches, day care centers and family day care for children under 3) in percentage of GDP. The total number of expenditures on childcare is divided by the number of children in that country aged 0-3 (OECD 2008). Finally, we included the incidence of *Part-Time Employment* as a percentage of total employment in a country to measure the amount of family support in a country through labor market participation, as we hypothesized that labor market participation can be encouraged by offering people with children the possibility to work part-time. Especially for single parents it can be attractive to have a part-time job, as they can still spend some time with their children and at the same time they have a higher income compared to a situation of non-employment.

**Control Variables** Finally, we included some independent variables as covariates. At the student level, we firstly included *Gender* (girls). Students were also asked to indicate in which program they were at school, which is used to construct *Educational Level*. This variable is measured according to the ISCED scale and consists of three dummy variables, i.e. lower secondary education, higher secondary education and unknown educational level. *Immigrant Status* is measured as first generation, second generation and unknown. At the school level, we included *Type of Community* in which the school is located (village or small town, town, city, big city and other). And, at the country level, we included *GDP per capita* (Purchasing Power Parity) and the distribution of family income in a country (i.e. *GINI index*), based on data from the World Factbook of the Central Intelligence Agency (CIA, 2004).

## RESULTS

Since we hypothesized effects on the individual (student) level and contextual (school and country) level, as well as cross-level interaction effects, we apply multilevel analysis techniques (Snijders and Bosker 1999). We distinguish three levels: the student level (level 1), school level (level 2) and country level (level 3). We discuss the results of the multilevel analysis for reading literacy and mathematical literacy together, as these results highly correspond to each other. Table 2 represents the multilevel regression models for reading literacy and Table 3 for mathematical literacy. In case we find differences in the effects of both models, we report on these.

We start by estimating a model including only the dummy variables of family form (i.e. single mother and mother plus guardian (Model 1)). The two-parent family is

used as reference category. This model shows that both children growing up in single-mother families without guardian and children growing up in single-mother families with guardian perform much worse on reading (-12.28 and -11.91 respectively) and mathematics (-16.10 and -17.17 respectively), compared to children growing up with two biological parents.

#### TABLE 2 AND TABLE 3 ABOUT HERE

In the next model, we also include the background characteristics that indicate the amount of resources available in a family and we control for other individual characteristics (Model 2). From this model we derive that children from single mothers do not show to have worse reading performance than children from two-parent families. However, their mathematical performance is significantly worse (-2.49). In addition, a negative effect of growing up in a family with a mother plus guardian is found for both reading and mathematical literacy, compared to children from two-parent families. Apparently, family's resources alone cannot explain the negative effect of growing up in a family in which a stepparent is present.

In Model 3, we start focusing on the school level by adding all school-level variables to the previous model. Although in this model we estimated both the main and interaction effects of school characteristics simultaneously, we also tested two models without the interaction terms in order to test H2a and H3a. First, we estimated a model without socio-economic status of the school and type of school and subsequently a model including these explanatory variables. The first model showed that the percentage of single-parent families at school has a large negative impact (-42.21 and -32.93 for reading and mathematical literacy respectively) and this result corresponds to H1 which predicted that children from schools with a large concentration of students from single-parent families perform less well than children from schools with a small concentration of students from single-parent families, independently of the family form they grow up in. From the next model it appeared then, that the negative effect of the percentage of single-parent families at schools reduces after controlling for the socio-economic status and type of school. Thus, conform H2a and H3a, we find that part of the effect of the percentage of single-parents families at school is explained by the socio-economic status and type of school.

In Model 3 then, we also include the interaction terms between the school characteristics and the family forms. From this model we can conclude that the effect of the percentage of single-parent families at school varies between children from different family forms: the average effect of growing up in a single-mother family

compared to a two-parent family is 1.63 for reading literacy and for mathematical literacy the small effect (-0.80) does not significantly deviate from children with two parents. However, at schools with the largest proportion of single-parent families the effect of growing up with a single parent is highly negative, i.e. -37.75 and -29.81 respectively for reading and mathematics. On the other hand, the average effect of growing up with a single mother is 8.58 for reading and 5.40 for mathematics at schools with the smallest proportion of single-parent families.<sup>3</sup> For children from families with a mother plus guardian, however, the effect of the percentage of single-parent families at school does not differ from the one for children from two-parent families. Furthermore, Model 3 shows that although the socio-economic status of a school influences the reading and mathematical performance of children positively, this effect is not larger for children from disrupted families, as we expected in H2b. On the contrary: growing up in a single-mother family or in a single-mother family plus guardian is more negative at schools with a higher socio-economic status. Therefore, we have to reject H2b for both children from single-mother families and children with single-mothers and a stepparent. Finally, we can derive from Model 3 that the effect of growing up with a single mother is -4.61 for children at private schools compared to an effect of 1.63 at public schools and that the effect of growing up with a single mother plus stepparent is -13.01 for children attending private schools, compared to an effect of -7.30 at public schools. Thus, we can conclude that H3b also needs to be rejected, which claimed that the positive effect of a school's social capital (which will be found in private schools) is larger for children growing up in single-parent families or stepfamilies, compared to children growing up in two-parent families.

In Model 4 we shift from the school level to the country level, by adding all country characteristics to Model 2, including the interaction terms between the country characteristics and the dummy variables of family form. First of all, we can derive from this model that the negative effect of growing up in a single-mother family is bigger in countries with a higher proportion of disrupted families. On average, the effect of growing up with a single mother is 1.82 for reading literacy. However, in countries with the largest proportion of disrupted families, the effect of growing up in a single-mother family is -13.38 and in countries with the smallest proportion of single-parent families an effect of 12.64 is found. This implies that

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<sup>3</sup> We calculated these effects as follows: for reading the interaction variable of single mother and percentage of single-parent families is -46.33. From Table 1 we can derive, that the effect of percentage of single-parent families is at most 0.85 bigger and -0.15 smaller than the average effect of this variable. Therefore, we multiply the effect of -46.33 by 0.85 and -0.15 and sum up the average effect of single mother of 1.63.

growing up in a country with a lot of other children from single-parent or stepfamilies negatively affects the effect of growing up in such a family oneself. For mathematical literacy, the effects of growing up with a single mother are highly similar. Moreover, it appears that the mathematical performance of children who grow up in a family in which a mother and a guardian are present are also negatively affected by the percentage of disrupted families in their country. However, this effect is not found for reading literacy.

With regard to the interaction variables between the policy indicators and family form, we can draw different conclusions. It appears that social expenditures on family benefits in a country do not affect reading or mathematical performance of children and neither affect children from various family forms differently. Since we do not find an effect of the public spending on family benefits, we have to reject H4. From Model 4 we can also learn that social security facilities do affect children from disrupted families differently than children from two-parent families. However, the effect has not the expected sign: for reading literacy we find that in countries with the most generous social security facilities, the effect of growing up with a single mother is -5.54, while it is 4.68 in countries with the weakest social security facilities. Also for children from families consisting of a mother and stepparent the same effect of social security facilities is found for reading literacy. For mathematical literacy, we only observe a negative effect of social security facilities for children from single-mother families. So, H5 has to be rejected based on the results of Model 4. Regarding the public spending on childcare in countries our results support H6. It appears from Model 4 that in countries spending the most on childcare the effect of growing up with only a mother is 6.12 and this effect is 0.07 in countries spending the least on childcare. We can conclude from these results that improving childcare apparently helps to reduce the negative effect of growing up with a single parent, or in this case it even enlarges the positive effect of growing up with a single mother. Finally, we can derive from Model 4 that the share of part-time jobs in a country has a negative influence on children's reading performance, and this effect is even more negative for children growing up with a mother plus stepparent. This implies that H7 needs to be refuted. This finding suggests that it is not beneficial for children from disrupted families (but neither for children from other kinds of families) to promote labor market participation in a country to enhance the economic situation of single-parent families.

Finally, we estimated a model including all variables and interactions at the student, school and country level (Model 5). We can conclude from this model that most of the effects that we have found for the separate analyses of the school level and the country level remain significant when we include the characteristics of both levels

simultaneously. This indicates that, in general, the effects we find at the school and country level are stable and both explain different parts of the variation in educational performance between children from different family forms. The few differences that we observe, however, do not lead to different conclusions with regard to our hypotheses, apart from the positive effect of public spending on childcare on educational performance of children growing up with a single mother, which is not significant anymore in Model 5. This implies that when school level effects are taken into account, we do not find support for H6.

## **CONCLUSION AND DISCUSSION**

In this paper, we have studied the relationship between family form and children's educational performance. The aim of our study was to contribute to the existing knowledge about family forms and children's educational performance by investigating how schools and countries affect the negative relationship between growing up in a disrupted family and children's educational performance.

First of all, we studied variation in the effect of family form on children's educational performance between schools. From the statistical interactions between school characteristics (i.e. percentage of single-parent families, socio-economic status and type of school) and family form (i.e. single-mother family and mother plus guardian family) we can conclude that the negative effect of growing up in a disrupted family is bigger when children attend schools with many other children from disrupted families, even after controlling for the socio-economic status of schools and the type of school (public versus private). Furthermore, we conclude that a school's socio-economic status does not reduce the negative effect of growing up with a single parent or stepparent. On the contrary, the positive effect of a school's socio-economic status on children's educational performance is smaller for children from disrupted families compared to children from two-parent families. This implies that the achievement gap between children from disrupted families and children with two biological parents is larger at schools with a higher socio-economic status. It also appeared that children from disrupted families attending private schools perform worse at school than children from disrupted families attending public schools. This result contradicts our expectations.

In addition to our study of the school level, we investigated the possibilities to reduce the negative effect of growing up in a disrupted family through policy measures at the country level. From the interactions between the policy indicators and family form we can conclude that a country's (family) policies do affect the relationship between family form and children's educational performance. However, it

turned out that the effects of the different policy indicators varied. With regard to policies that support families through economic assistance, like family benefits, we can conclude that there is no evidence for the existence of a positive effect of these kinds of policies on the relationship between family form and children's educational performance. This implies that children growing up with a single parent or stepparent, on average, have worse educational performance than children from two-parent families, and, that economic assistance apparently cannot reduce differences in educational performance between these family forms.

Regarding the effect of family support through social security facilities, in our case through a country's social expenditures on unemployment, we can conclude that such policies supporting families do affect children from disrupted families differently compared to children from two-parent families, but that social security facilities do not reduce the negative effect of growing up in a disrupted family. On the contrary: it appeared that a country's social expenditures on unemployment even enlarged the negative effect of growing up in a disrupted family, and, consequently increased the achievement gap (of both reading and mathematics) between children from single-mother families and children from two-parent families. Therefore, we conclude that more general financial support-policies in a country, i.e. policies not especially shaped to benefit families with children, do not reduce the negative effects of growing up in a disrupted family, but even enlarge those effects.

With respect to the policies towards childcare in a country, we can conclude that those policies do work the way we expected them to work: growing up in a single-mother family (compared to a two-parent family) is less negative in countries in which childcare-policies are more ample. This implies that children who live in countries in which more money is spent on childcare, which will positively affect the quality of the care, will be more benefited by going to child care in terms of higher reading and mathematical performance. Even though the students we investigated in our analysis will not go to childcare at the moment of the interview, the childcare they received when they were younger will have positively influenced their educational knowledge and skills already earlier and they can still profit from this when they are older.

Finally, with regard to family policies promoting labor market participation, i.e. through enabling part-time work in a country, we conclude that, first of all, such policies affect all children's educational performance negatively. Moreover, we do not find differences in this effect between children growing up in different family forms. This implies that when countries encourage people to start working, children from disrupted families, but also children from two-parent families are not benefited by this kind of policy. Apparently, the fewer time that parents can spend with their children,

for instance on helping with their homework, when parents start to work, is more important for children's educational performance than the additional income the family receives through work.

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Table 1 Descriptive Statistics for Independent Variables

	Minimum	Maximum	Mean
<i>Dependent Variables</i>			
Reading Literacy	9.43	868.38	514.35 (87.94)
Mathematical Literacy	48.18	824.38	519.70 (87.92)
<i>Student Level Independent Variables</i>			
Family Form			
Mother & Father	0	1	0.81
Single Mother	0	1	0.13
Mother & Guardian	0	1	0.06
Gender (Girl)	0	1	0.51
Educational Level			
Lower Secondary Education	0	1	0.44
Higher Secondary Education	0	1	0.48
Unknown Educational Level	0	1	0.08
Immigrant Status			
Native	0	1	0.80
Second Generation	0	1	0.12
First Generation	0	1	0.05
Unknown	0	1	0.03
Parental Occupational Status	0	1	0.45 (0.22)
Parental Educational Level			
Lower Secondary	0	1	0.11
Higher Secondary	0	1	0.38
Tertiary	0	1	0.51
Parental Working Hours			
Non-Working	0	1	0.29
Part-Time	0	1	0.23
Fulltime	0	1	0.48
<i>School Level Independent Variables</i>			
% Single-Parent Families	-0.15	0.85	0.01 (0.05)
Socio-Economic Status	-0.46	0.54	0.01 (0.07)
Type			
Public	0	1	0.71
Private	0	1	0.14
Unknown	0	1	0.15
Community			
Village/Small Town	0	1	0.34
Town	0	1	0.31
City	0	1	0.18
Big City	0	1	0.08
Other	0	1	0.09
<i>Country Level Independent Variables</i>			
% Disrupted Families	-0.42	0.59	0.01 (0.20)
GDP (per capita)	-0.42	0.58	-0.01 (0.18)
GINI	-0.33	0.67	0.02 (0.20)
Public Spending on Family Benefits	-0.42	0.58	-0.03 (0.21)
Social Security Facilities	-0.28	0.72	0.01 (0.24)
Public Spending on Child Care	-0.29	0.71	-0.04 (0.24)
Part-Time Employment	-0.42	0.58	0.01 (0.23)

Source: Pooled PISA 2000 and 2003

Table 2 Multilevel Regression Models for Reading Literacy ( $N_{\text{students}} = 196,118$ ;  $N_{\text{schools}} = 3,725$ ;  $N_{\text{countries}} = 25$ )

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	514.06 ***	408.87 ***	406.47 ***	407.87 ***	405.52 ***
<i>Student Level Effects</i>					
<i>Family Form</i>					
Mother & Father	ref.	ref.	ref.	ref.	ref.
Single Mother	-12.28 ***	-0.04	1.63 **	1.82 ***	3.08 ***
Mother & Guardian	-11.91 ***	-8.77 ***	-7.30 ***	-8.38 ***	-7.20 ***
Gender (Girl)		33.44 ***	33.24 ***	33.42 ***	33.21 ***
<i>Educational Level</i>					
Lower Secondary Education		ref.	ref.	ref.	ref.
Higher Secondary Education		44.06 ***	42.89 ***	44.85 ***	43.77 ***
Unknown Educational Level		32.04 ***	28.34 ***	29.39 ***	27.74 ***
<i>Immigrant Status</i>					
Native		ref.	ref.	ref.	ref.
Second Generation		-6.16 ***	-7.09 ***	-6.27 ***	-7.19 ***
First Generation		-30.65 ***	-31.54 ***	-30.67 ***	-31.55 ***
Unknown		-24.11 ***	-24.40 ***	-24.06 ***	-24.38 ***
Parental Occupational Status		95.30 ***	91.28 ***	94.92 ***	90.85 ***
<i>Parental Educational Level</i>					
Lower Secondary		ref.	ref.	ref.	ref.
Higher Secondary		18.05 ***	17.99 ***	17.96 ***	17.85 ***
Tertiary		28.97 ***	28.24 ***	28.90 ***	28.18 ***
<i>Parental Working Hours</i>					
Non-Working		ref.	ref.	ref.	ref.
Part-Time		5.19 ***	5.13 ***	5.15 ***	5.07 ***
Fulltime		1.79 ***	1.74 ***	1.80 ***	1.73 ***
<i>School Level Effects</i>					
% Single-Parent Families			-19.63 **		-18.66 **
Socio-Economic Status			161.07 ***		160.11 ***
<i>Type</i>					
Public			ref.		ref.
Private			14.86 ***		15.05 ***
Unknown			2.41		-5.17 **
<i>Community</i>					
Village/Small Town			ref.		ref.
Town			2.33 ***		2.36 ***
City			5.40 ***		5.37 ***
Big City			7.12 ***		7.33 ***
Other			4.15 **		9.23 ***
<i>Interaction Effects (School Level)</i>					
% Single-Parent Families * Single Mother			-46.33 ***		-37.02 ***
% Single-Parent Families * Mother & Guardian			4.76		6.67
Socio-Economic Status * Single Mother			-15.29 *		-10.54
Socio-Economic Status * Mother & Guardian			-21.07 **		-18.39 *
Private * Single Mother			-6.24 ***		-8.34 ***
Private * Mother & Guardian			-5.71 **		-6.39 **
Unknown * Single Mother			-0.16		2.06
Unknown * Mother & Guardian			-3.47 **		-1.79
<i>Country Level Effects</i>					
% Disrupted Families				-1.38	11.45
GDP (per capita)				90.57	99.24
GINI				27.76	30.82
Public Spending on Family Benefits				3.06	5.83
Social Security Facilities				-8.62	-16.75 ***
Public Spending on Child Care				15.59	13.70
Part-Time Employment				-145.36 ***	-172.63 ***
<i>Interaction Effects (Country Level)</i>					
% Disrupted Families * Single Mother				-25.77 ***	-27.33 ***
% Disrupted Families * Mother & Guardian				-7.85	-8.25
GDP * Single Mother				-2.50	-0.31
GDP * Mother & Guardian				4.46	5.04
GINI * Single Mother				-13.17 **	-12.98 ***
GINI * Mother & Guardian				-10.47 *	-10.05
P.S. on Family Benefits * Single Mother				4.99	4.41
P.S. on Family Benefits * Mother & Guardian				-6.49	-6.11
Social Security Facilities * Single Mother				-10.22 ***	-5.44 *
Social Security Facilities * Mother & Guardian				-6.69 *	-2.82
P.S. on Childcare * Single Mother				6.05 *	3.73
P.S. on Childcare * Mother & Guardian				-5.84	-7.26 *
Part-Time Employment * Single Mother				-2.08	-2.49
Part-Time Employment * Mother & Guardian				-7.42 *	-5.83
<i>Variance Components</i>					
Student Level	6847.78	5676.44	5659.65	5668.50	5651.37
School Level	1624.96	1094.83	727.41	1075.70	707.94
Country Level	352.08	496.62	466.40	2171.20	2639.63
<i>Deviance</i>	2295319	2257968	2256344	2257679	2256038

\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

Source: Pooled PISA 2000 and 2003

Table 3 Multilevel Regression Models for Mathematical Literacy (N<sub>students</sub> = 196,118; N<sub>school</sub> = 3,725; N<sub>countries</sub> = 25)

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	518.39 ***	435.53 ***	433.89 ***	434.60 ***	432.98 ***
<i>Student Level Effects</i>					
<i>Family Form</i>					
Mother & Father	ref.	ref.	ref.	ref.	ref.
Single Mother	-16.10 ***	-2.49 ***	-0.80	-0.79	0.36
Mother & Guardian	-17.17 ***	-11.45 ***	-10.51 ***	-10.73 ***	-10.00 ***
Gender (Girl)		-12.06 ***	-12.26 ***	-12.08 ***	-12.29 ***
<i>Educational Level</i>					
Lower Secondary Education		ref.	ref.	ref.	ref.
Higher Secondary Education		46.95 ***	45.83 ***	47.82 ***	46.76 ***
Unknown Educational Level		32.64 ***	28.83 ***	29.85 ***	28.45 ***
<i>Immigrant Status</i>					
Native		ref.	ref.	ref.	ref.
Second Generation		-8.39 ***	-9.09 ***	-8.51 ***	-9.20 ***
First Generation		-24.12 ***	-24.74 ***	-24.22 ***	-24.81 ***
Unknown		-26.62 ***	-26.78 ***	-26.55 ***	-26.74 ***
Parental Occupational Status		94.52 ***	90.94 ***	94.06 ***	90.41 ***
<i>Parental Educational Level</i>					
Lower Secondary		ref.	ref.	ref.	ref.
Higher Secondary		16.46 ***	16.39 ***	16.36 ***	16.23 ***
Tertiary		28.20 ***	27.52 ***	28.16 ***	27.49 ***
<i>Parental Working Hours</i>					
Non-Working		ref.	ref.	ref.	ref.
Part-Time		6.42 ***	6.36 ***	6.36 ***	6.30 ***
Fulltime		2.17 ***	2.15 ***	2.16 ***	2.11 ***
<i>School Level Effects</i>					
% Single-Parent Families			-13.20 *		-15.57 **
Socio-Economic Status			150.67 ***		148.33 ***
<i>Type</i>					
Public			ref.		ref.
Private			13.58 ***		13.72 ***
Unknown			2.63		-7.55 ***
<i>Community</i>					
Village/Small Town			ref.		ref.
Town			1.52 ***		1.63 ***
City			3.53 ***		3.61 ***
Big City			4.88 ***		4.99 ***
Other			3.18 *		9.93 ***
<i>Interaction Effects (School Level)</i>					
% Single-Parent Families * Single Mother			-36.01 ***		-27.25 **
% Single-Parent Families * Mother & Guardian			3.50		6.31
Socio-Economic Status * Single Mother			-12.20		-8.39
Socio-Economic Status * Mother & Guardian			-19.19 *		-16.59
Private * Single Mother			-5.72 ***		-7.10 ***
Private * Mother & Guardian			-4.80 **		-5.63 **
Unknown * Single Mother			-2.17		0.51
Unknown * Mother & Guardian			-0.98		0.74
<i>Country Level Effects</i>					
% Disrupted Families				-2.51	9.56
GDP (per capita)				108.73 *	121.22 *
GINI				1.65	6.76
Public Spending on Family Benefits				-0.57	3.55
Social Security Facilities				17.93 ***	9.13
Public Spending on Child Care				4.62	1.98
Part-Time Employment				-182.88 ***	-217.47 ***
<i>Interaction Effects (Country Level)</i>					
% Disrupted Families * Single Mother				-26.76 ***	-27.87 ***
% Disrupted Families * Mother & Guardian				-12.90 **	-13.90 **
GDP * Single Mother				0.75	2.29
GDP * Mother & Guardian				9.33	10.17 *
GINI * Single Mother				-11.58 **	-11.35 **
GINI * Mother & Guardian				0.89 *	1.60
P.S. on Family Benefits * Single Mother				-0.66	-0.63
P.S. on Family Benefits * Mother & Guardian				-2.11	-2.09
Social Security Facilities * Single Mother				-12.61 ***	-8.37 ***
Social Security Facilities * Mother & Guardian				-5.04	-1.24
P.S. on Childcare * Single Mother				6.40 *	4.27
P.S. on Childcare * Mother & Guardian				0.61	-0.33
Part-Time Employment * Single Mother				-1.49	-1.38
Part-Time Employment * Mother & Guardian				-8.28 *	-8.11 *
<i>Variance Components</i>					
Student Level	6809.75	5855.37	5844.38	5847.50	5836.07
School Level	1381.76	1018.62	694.10	980.60	661.32
Country Level	439.32	608.19	564.66	2908.60	3674.98
<i>Deviance</i>	2293797	2263783	2262458	2263463	2262114

\*p<.1. \*\*p<.05. \*\*\*p<.01.

Source: Pooled PISA 2000 and 2003