Gender and Professional Career Plans of High School Students in Comparative Perspective

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The time when young women left the labour force upon marriage, and thus had much more modest educational and occupational expectations than young men, belongs to history. Recent studies in the USA and Canada show that at 15, girls now plan to attain higher levels of education and are more determined to enter professional careers than boys. We seek to establish whether this is the case in many different cultures and socio-economic conditions. To this end, we analyse the data from the 2006 round of the OECD's Program for International Student Assessment (PISA), conducted in over 50 countries. First we establish whether girls are more ambitious than boys across countries when we control for the variation in academic ability, home and school environments. Second we examine the possibility that the attraction to professional occupations can be explained by gender-typed choices, i.e. girls' preference for nursing and teaching versus boys' determination to enter trades. Third, we examine how school characteristics, i.e. the proportion of female students, school resources, socio-economic characteristics of parents as well as the macro-social contexts, i.e. labour market opportunities open to women, may help girls set higher achievement goals. Finally, we consider how likely are girls, compared to boys, to answer questions about career plans, because any gender bias in the patterns of missing data might affect the overall conclusions. We conclude by discussing the implications of these gender differences, with a special focus on a dilemma they may pose for policy makers.

Keywords: gender, occupational expectations, PISA, school students, comparative education

Introduction

Decades ago young women had modest occupational expectations compared to young men. However, today in recent cohorts, women match or even exceed the ambitions of their male counterparts. This is not surprising since the comparative literature on gender inequality in education has shown that while class differences in educational outcomes have persisted over time, in most developed countries gender inequalities have diminished or even reversed direction (Blossfeld & Shavit, 1993: 77; Marks, 2008). As women achieve parity and even overtake men in educational attainment in many fields, their occupational expectations are likely to rise accordingly. Indeed Buchmann and Dalton (2002) found that, in eight out of the twelve countries which they studied, girls were more likely than boys to plan to go to university. Thus, by implication, they were more likely to pursue a professional career.

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Occupational expectations are important because, although the actual relevance of expectations for predicting ultimate behaviour has been subject to many debates (Saha, 1997), recent studies have confirmed that adolescent expectations are crucial for subsequent success in early adulthood (Feliciano & Rumbaut, 2005; Jacobs, Chhin, & Bleeker, 2006). Therefore the timing of the formation of occupational plans, as well as their contents, is critical for actual educational and occupational attainments, at least in early adulthood.

Taking advantage of the rich cross-national PISA data, we focus in this paper on establishing the extent to which gender differentiates between the occupational plans of adolescents, net of influences exerted by varying institutional, economic and cultural milieus.

In this context we raise a number of questions. Do more girls than boys expect to enter professional careers? Can the differences in occupational plans between boys and girls be fully explained by the gap in academic performance between genders? Do these differences hold after a large number of individual, school, and some country characteristics are taken into account? Finally, to what extent, based on the examination of missing data patterns, which we interpret as a sign of uncertainty, can we assume that boys might form their ambitions for entering particular careers later than girls?

We ask these questions in a comparative framework with the understanding that particular gender symbolisms, identities and organisations may result in a range of dramatically different occupational plans for individual adolescents (McCall, 1992). At the same time, at more aggregate levels, it is plausible to expect universal gender trends which are attributable to the influence of a globalized ideology which informs educational policies and permeates cultures in many countries.

Aspirations, Expectations, Attainments and Gender

For more than fifty years social scientists have known that educational attainment was directly related to occupational attainment (Dronkers, 1997). Hence authors of recent studies tend to take the strong relationship between educational attainment and occupational outcomes for granted (Breen & Yaish, 2006). The importance of occupational plans is reflected in Bourdieu's theory of social order, which highlights occupation "as the primary organising variable for the positions in social structure" (McCall, 1992).

The research on career plans has been traditionally undertaken by sociologists in two traditions: 1) the social psychological/socialisation tradition and 2) the stratification/allocation tradition. In addition, psychologists of career development have focused their efforts on understanding how to best match occupations to individual personalities and thus provide adolescents with suitable counselling (Holland, 1997).

The social psychological/socialisation tradition has placed emphasis on individual determinants of career plans, for instance, "ambitions" as discussed by Turner (1964), and societies' levels of "need for achievement" as discussed by McClelland (1961). In this tradition "aspiration" and "expectation" became distinguished as non-equivalent. While the first concept was seen as possibly "unrealistic", the second was perceived as more "realistic", that is, formed with the recognition of existing social restraints (Caro & Pihlblad, 1965; Desoran, 1977/1978; Empey, 1956; Han, 1969; Saha, 1983, 1997). The socialisation perspective corresponds to the parallel tradition of research in developmental psychology, which has focused on personality traits, modified by environmental factors and their role in career choice formation (Holland, 1997). The adherents of this tradition expected boys and girls to have different career expectations because of the contents of their socialisation experiences, that is, through the cultivation of typically feminine and masculine traits and personality differences (Tang, Pan, & Newmeyer, 2008; Turner, Conkel, Starkey, & Landgraf, 2008).

The social allocation perspective has focused on social structural constraints, that is, race, ethnicity, institutional settings, including features of particular schools or school systems and labour market characteristics. Individual drive, ability and personal attributes are limited by these structural boundaries, and the career plans of youth, at the age of 15, begin to reflect the recognition of these structural constraints. A more detailed review of the social allocation tradition has been provided in Sikora and Saha (2007) and Saha and Sikora (2008).

Taking into account these traditions, the literature, which has focused specifically on gender differences in the formation of expectations and aspirations, has been growing in recent years. While some authors argue that gender differences in this area are diminishing (Beutel & Marini, 1995; Regan & Roland, 1982) others have emphasised 'the idea of pervasive gender differences in the transitions to work ...' (Looker & Magee, 2000: 77). Feminist extensions of Bourdieu's theory of social order stress that occupational choices are persistently gender circumscribed, although it would be misleading to always expect females to choose traditionally feminine occupations, and males to choose masculine occupations (McCall, 1992). This tradition of research proposed that women may increasingly prefer masculine occupations and succeed in entering them, although cultural definitions of gender will continue to define their experiences.

The emphasis on the transition in cultural value systems relates to the neo-institutionalist perspective, informed by modernisation theory, which stipulates that educational policy and its outcomes are likely to evolve towards a global and homogeneous format, driven by universal goals as exemplified by the Millennium Development Goals (United Nations, 2008: Goals 2 and 3). Gender equity in education has been on the agenda of many governments, and the neo-institutionalist ideology fosters the perception that young women can and should achieve to the same level as men. Moreover, adjustments to the curricula over the last couple of decades have been introduced purposefully to take advantage of the traditional strengths of female students, which may in turn boost both their expectations and achievement. Thus overall, girls in recent cohorts should have quite ambitious occupational plans.

Yet neo-institutionalism on its own does not recognize that young women may incorporate the prospect of parenthood into their career plans differently from men, and thus tend to lean toward 'artistic' and 'social' occupations compared to traditionally male preference for 'investigative'and 'realistic'careers (Holland 1997). Holland's typology attaches the label of 'investigative' to occupations such as technicians or engineers, while craftsmen, car mechanics and farmers are grouped under the 'realistic' careers. Looker and Magee (2000) review the literature which asserts that adolescent women are aware of their future responsibilities as mothers and adjust their career plans accordingly, that is, they are guided by the perceived motherhood friendliness of their future jobs. They thus opt for middle status, low pay and traditionally female occupations. The opponents of this view argue that young women opt out of having children or reduce their number to meet their professional career desires. According to this perspective, women aim to work in professional and demanding fields and adjust their parenting roles accordingly (Looker and Magee 2000).

These are some of the important issues which are related to our investigation of the determinants and the outcomes of gender-specific career plans. With these issues in mind, we now turn our attention to the hypotheses which will guide our analysis.

Hypotheses

Schofer and Meyer (2005) argued that countries in both the centres and the peripheries of the world embrace education models in which the prospect of professional employment in globalising markets and the commonality of the university experience are increasingly taken for granted. This neo-institutionalist argument stipulates a convergence between genders in occupational expectations over time, as the patriarchal organisation of social life becomes eroded by world-wide industrialisation.

The discernible focus of this global trend on gender equity in the context of traditional disadvantage for girls may lead to more concerted efforts by policymakers to encourage the higher educational attainment of females. This leads us to expect that, in all countries which participated in the 2006 PISA study, girls will report the intention to work in professional occupations at least as frequently as boys (Hypothesis 1, or H1). We further expect that in most countries girls' expectations will exceed those of boys (H1a). As most young people are likely to want to have families and children, this would imply that ambitious plans among girls, in their view, do not have to be equivalent to giving up on the dream of having a family and children. In Australia, for example, surveys of young people indicate that at 20, almost 70% of men and even a higher proportion of women want to have children (Qu & Weston, 2004). But as parenthood comes later in life in developed countries, for example, in Australia, the median age of the mother at birth of the first child exceeded 30 in 2005 (ABS 2008). Thus, it is reasonable to assume that girls expect to be established in their professional careers before starting a family. Therefore, the ambitious career plans of young women do not have to compromise their plans for a family.

This, in combination with a curriculum development policy to reduce gender inequality, leads to the expectation that, in terms of occupations most frequently chosen

by girls, there should be less preference for feminised nursing and primary school teaching as the dominant choice. Thus our second hypothesis is that the occupational expectations of girls will not be dominated by traditional feminine careers (H2).

In line with the social allocation tradition, we also hypothesise that macro-social conditions have an influence on what careers girls expect to have. The literature demonstrates lower returns to education among women in more developed and egalitarian countries (Psacharopoulos and Patrinos 2004), which is consistent with our prior research (Sikora and Saha 2007). Thus we expect that girls who reach high school in poorer countries with higher levels of inequality, and where economic opportunity structures available to women are more limited, find professional occupations more desirable than their counterparts in richer countries with more economic gender equality (H3).

Finally, it is well known that girls are on average better in English than boys, while in many countries, boys outperform girls in mathematics (OECD Organization for Economic Cooperation and Development, 2007). Moreover, strong academic performance is known to boost both educational and occupational plans. Therefore, in assessing the effects of gender on career choice, we control for academic ability as measured by reading scores. Because we expect broader cultural changes as well as opportunity structures to be responsible for the gender gap, our hypothesis is that the difference between girls and boys in their career plans will persist, even after the variation in gender specific academic performance has been factored out (H4).

Data, Measurement and Methods

Our dependent variable is derived from a single question in PISA surveys.

> What kind of job do you expect to have when you are about 30 years old?
>
> Write the job title:_____

In PISA 2006 we have data from over 50 countries, although the demands of multilevel modeling limit our sample to 44 countries. (See the footnote to Table 1.) Participation in PISA continues to be dominated by OECD countries, but the presence of schools from 'lower-middle income' countries, using the World Bank terminology, provides insights into a broad spectrum of different economic and cultural settings.

Data and Measurement

The PISA occupational data were recoded into the ISEI index of occupational prestige (Ganzeboom & Treiman, 1996), which, as a measure of occupational expectation, is our dependent variable. The lowest score on the index is 10 and it denotes people working as farm hands or other unskilled laborers. The highest score is 90 and it indicates the most highly qualified professionals such as medical specialists, senior lawyers or scientists.

Consistent with the social allocation and the socialisation perspectives, our independent variables comprise individual student and family characteristics, a broad range of school characteristics and two key country level characteristics reflecting

economic opportunity structures available to women. We use the proportion of female employment relative to the total female population aged 15 to 64 as an indicator of labor market opportunities for women, and the Gini coefficient, as the measure of country inequality (World Bank, 2007). The latter is relevant as women are known to account for a significant proportion of the poor in countries with higher levels of inequality. We treat both these variables as indicative of institutional settings where women have more (or less) economic and political power.

We confine our controls at country level to only two variables because many characteristics at the country level are closely interrelated. This means that GDP per capita is strongly correlated with social inequality (denoted by the Gini coefficient), the proportion of women who hold seats in parliament in each country, the proportion of females in the labour force relative to total employment, the proportion of women who are employed in services, and the proportion of women who work for pay relative to the whole female population aged between 15 and 64 years of age. Therefore the use of all these measures simultaneously in our analysis would lead to statistical problems. Yet, they are interrelated and a positive association between occupational plans and each measure implies a positive association between these plans and the others.

At the school level we control for: 1) averaged parents' SES, which identifies schools with higher proportions of students from privileged backgrounds, 2) the proportion of girls at school, 3) school ownership ranging from exclusively public, through private with government involvement to exclusively private. Moreover, we control for 4) selectivity, i.e., the existence of a school policy of using academic ability as an admission criterion (coded 0 for schools that do not have such a policy and 1 for those that do), 5) the number of Internet enabled computers in a school, and 6) school size and the size of town in which each school is located. All of these factors are known to boost students' academic performance, and by analogy, can be expected to boost their occupational expectations (OECD Organization for Economic Cooperation and Development, 2007).

At the individual level we include gender and parents' socioeconomic status created from the information on parents' average ISEI score and average years of schooling completed, using the template provided by the 2003 PISA manual (OECD 2005). Education and occupation contribute equally to our measure of parents' SES. Although family income information became available for 16 countries in 2006, in this analysis we do not control for this variable as doing so would result in a too small sample size at the country level. Following prior research based on the PISA data (Buchmann and Park 2005), we included the combined reading scale as an indicator of prior academic achievement, as the actual data on prior academic achievement are not available. We also control for students' participation in either vocationally or pre-vocationally-oriented programs within the school.

Method

We employ a random intercept three-level linear model, as available in HLM version 6.06, in which students are clustered in schools and schools are clustered in countries, as

in Equation. 1. This model allows us to take into account country, school and student characteristics.

Eq 1:

$$Expected\_Occupation_{i} = constant_{ijk} + Gini_{k} + Proportion\_Women\_in\_Labour\_Force_{k} + Average\_Parents'SES\_in\_school_{jk} + Proportion\_of\_Girls\_in\_school_{jk} + Private\_school_{jk} + Selective\_admission\_policy\_in\_school_{jk} + Computers\_with\_Internet\_at\_school_{jk} + School\_size_{jk} + Size\ of\ town_{jk} + Male_{ijk} + Parents'\_SES_{ijk} + Vocational\_Program_{ijk} + Reading\_score_{ijk} + v_{0k} + u_{0jk} + e_{0ijk}$$

All our estimations are weighted by the country factor which ensures that each country contributes equally to the analysis (OECD Organization for Economic Cooperation and Development, 2008). As we rely on linear models which are sensitive to departures from normality assumptions, all the analyses have been performed with robust standard errors.

Results

We first examine average occupational expectations of boys and girls across countries. Table 1 presents the average ISEI scores which range from a low of 10 to a high of 90. Low ISEI scores denote unskilled, manual occupations, while the highest scores correspond to the professional, specialised jobs, which usually require a university degree at entry point. To facilitate the examination of the estimates in Table 1, we have organised countries into panels by geographic region. Moreover, we grouped together the former soviet republics and the former satellite countries of the Soviet Union. Some nations, such as Tunisia, Turkey or Jordan, do not naturally belong in any of the groups, but we retain them as 'stand alone' cases for comparison.

The most striking feature of the data in Table 1 is that in almost all countries, regardless of the political culture, region or level of economic development, girls at 15 have more ambitious plans than boys. This supports Hypotheses 1 and 1a.

[Table 1 about here]

The only exceptions to this prevalent pattern are the Netherlands, Switzerland and Germany where there are no gender differences, and Korea where boys still outdo girls in their commitment to pursuing professional careers.

The gender gap varies significantly from country to country, and in some locations, e.g. the UK, Australia and Japan, the gap is merely one or two ISEI points, while in others, such as Brazil, it exceeds several ISEI points. Despite the variation in the size of this gap, the consistency of the overall direction of this pattern (i.e. more ambitious girls) is noteworthy. Moreover, while the variation between countries is significant, it is clear that the students in the Central and South American countries where economic inequalities are greater than in Western Europe, and in the only Middle East and only African country for which we have data, report very ambitious career plans, compared with their peers in the developed West. A similar tendency is observed within the post-Soviet block where the poorer and more unequal conditions inspire more ambitious plans among high school students. As we examined the influence of these macro-economic factors in detail in our previous research (Sikora & Saha, 2007), here we will only note that, in line with Hypothesis 1, the gender gap is evident in both the poor and the wealthy countries, as well as in capitalist and post-socialist economies.

Next, to examine the evidence related to our Hypothesis 2, we turn our attention to gender specific preferences in two sub-sets of countries: 1) those with relatively low female representation in the labour force, and 2) those where such representation is significantly higher. In the group of 45 nations for which we have the data, we first selected a group of countries for which the female labor force participation rate, understood as the percentage of female population aged 15-64 in the labor force, did not exceed 54% in 2006. Such countries include Bulgaria, Chile, Italy, Jordan, Mexico, Tunisia and Turkey, a group quite diverse in terms of political and economic characteristics. On the other hand, for the second group, we chose countries in which the female labor force participation rate exceeded 70%, and, in our study, these countries included Canada, Denmark, Finland, the Netherlands, New Zealand, Sweden and Switzerland. This group represents more similar, wealthy economies with well developed, although diverse, welfare states systems.

[Table 2 about here]

Table 2 lists the 12 most popular expected occupations for girls and boys in each group of countries. We first turn to gender differences. The examination of occupational titles listed for boys and girls reveals both the traditional gender typing of occupations, and signs of convergence in some occupational choices (assuming these choices were more gender-typed in the past). The latter is exemplified by the universal attractiveness of medicine as the most preferred career. In the Holland typology (1997), medicine typifies ‘investigative’ occupations while law is a typical ‘enterprising’ occupation, and both are usually assumed to be typical boy’s choices (Turner, Conkel, Starkey, & Landgraf, 2008). But law and medicine here come across as areas of employment that attract both boys and girls in different cultural and economic contexts. Moreover the ‘social’ occupations, for example teaching, also seem to be attractive to both boys and girls. Finally girls, relative to boys, prefer psychology which is another ‘investigative’ type of a career.

However, the gender differences do persist. Boys more often choose engineering careers, and ‘realistic’ occupations, using Holland’s terminology (1997), such as car mechanics, although some types of engineering, related to architecture, and thus ‘artistic’ careers, appear in the preferences of girls. But while engineering dominates boys’ preferences it is almost absent from girls’ choices. Nursing, as expected, is absent from the list of popular choices among boys, but features prominently in girls’ preferences. Girls, as found years ago

by Holland, still opt more frequently for 'artistic' careers such as writing, acting or decorating.

[Table 3 about here]

Another distinctive feature of Table 2 is that the focus on professional occupations is stronger in nations where female labour force participation is lower as predicted by our Hypothesis 3. Boys' and girls' modal career choices in the top panel of Table 2 are almost exclusively accounted for by ISCO codes starting from digit 2, which are indicative of professional occupations. Moreover, there are fewer differences between boys' and girls' choices in these countries, compared to nations with more than 70% women in the labour force which serves more developed and diversified economies. This pattern points to the importance of relative attractiveness of professional employment versus other options in different economic settings. Many girls in richer countries plan to become hairdressers while boys opt to work as car mechanics. This, as we found in our prior research, can be explained by the higher secondary education participation rates which include youth in vocational programs (Sikora and Saha 2007) and, most likely, the relative attractiveness of these skilled service jobs in developed economies. So overall, while our Hypothesis 3 is supported, the evidence regarding our Hypothesis 2 is mixed. We see strong elements of convergence between boys' and girls' occupational plans, particularly in countries where female employment levels are lower, but the traditional preference of girls for artistic and caring occupations is still evident in our data regardless of the economic and cultural contexts.

We now turn to the results of our multivariate analysis which tests Hypothesis 4. It posits that gender differences in career plans cannot be attributed solely to the differences in academic performance (i.e., the reading score) between males and females. In testing this proposition we must take into account factors influencing occupational plans at the family, school and country levels. Table 3 presents two relevant analytic models. The difference them is that in Model 1, reading score at the individual level is not included, whereas it is included in Model 2. Contrasting both models demonstrates that boys are significantly less likely to name professional careers as their expected occupational attainment than girls (see the negative coefficients in bold type in Table 3, -3.26 and -1.63). This difference in favour of girls remains significant after we take into account many factors that affect career choices at the three levels of our hierarchical models. About half of this gender effect can be attributed to girls' better performance at school (i.e. the difference between -3.26 and -1.56 is the part of the gender effect explained by the inclusion of reading score, a proxy for academic performance, in Model 2).

If we keep in mind that the high occupational expectations for girls across these countries represents a fairly recent reversal of the traditional male dominance in this area, what other variables besides academic achievement can explain this reversal? Given our earlier discussion of global changes in gender equity concerns, the other half of the gender difference has to be explained by the changes in both cultural contexts, i.e. gender symbolism and organisation as well as perceived opportunity structures among adolescent girls in this sample of countries. The convergence trend noted in the discussion of Table 2 juxtaposed to the results from the multilevel model in Table 3, makes it clear that girls rely less than they might have before, on traditional artistic and social occupations, but when they choose them, their preferences cluster heavily at the professional, that is, highly skilled end of occupational

hierarchies within these career fields. This is particularly the case in countries where women are yet to achieve high levels of labour market participation.

An important caveat that applies to our model in Table 3 is that it assumes slopes to be the same across countries. It does not highlight country differences in the size of gender effect. However, additional analyses, which we have performed separately for each of the 45 countries, reveal that, once the differences in academic performance of genders are taken into account, only in six countries do boys tend to be a little more ambitious than girls. Everywhere else girls either expect to enter professional occupations as often as boys do or even more frequently. The latter is the case in 25 countries, where girls are significantly more oriented towards professional careers than boys, after we control for the school and individual characteristics. (See Appendix Table 1, under the "Male" column for the relevant coefficients.) In the remaining 14 countries gender differences are not statistically significant after academic ability is taken into account. This emphasises the importance of country-specific conditions, educational policy and cultural contexts, but the tendency for young females to report ambitious occupational expectations is evident across a range of macro-social settings.

[Figure 1 about here]

A second caution regarding the PISA data, and therefore our study, is the high proportion of missing data on expected occupation, which varies systematically by gender. As Figure 1 illustrates, in most countries boys are less likely than girls to answer the question about their future career. Although the proportion of missing data is very high in some countries, we are reluctant to interpret it as solely an indication of poor quality of the information in PISA. This is for two reasons. First, when we conducted sensitivity analyses in which all countries with more than 30% of missing data among either girls or boys were left out, we found essentially identical results. Second, because prior studies of occupational expectations point to a gender lag, i.e., the systematic difference between boys and girls in the timing of career-plan- formulation (White 1997, Feliciano & Rumbaut, 2005). Alternatively, however, the administration of PISA questionnaires at school may enhance the effect of academic performance on response rates to the study. That is, students who are academically more motivated, may feel obliged to answer the question about their occupational plans as they would feel compelled to give an answer to a school test question. We cannot judge between these two explanations, but the relationship between gender and the likelihood of giving an answer to the question about the future career seems to hold in most of our countries. This calls for a future systematic investigation of missing data, as all conclusions drawn from the PISA data on this subject are possibly affected by this bias.

Summary and Discussion

Our analysis of gender-typed occupational expectations of adolescents in many countries finds clear gender differences in unadjusted occupational plans. Young women are almost universally more oriented towards professional careers than young men. In many countries, this difference can be attributed to the systematic differences in the school experiences of girls and boys. This is why, when gender differences in academic performance are taken into account, and we control for home and school environments, we find that of the 41 countries where girls expected higher status occupations, the net gender difference persists only in 25 countries. (See Appendix, Table 1.) Where gender differences in the likelihood of professional career formation cannot be accounted for by school performance, labour market

opportunity structures, educational ideologies behind policy making, and other cultural gendered norms must be considered.

The examination of the modal occupational choices of boys and girls in various economic contexts shows that gender-segregation of desired careers is stronger in more prosperous and specialised labour markets where women have more chances of paid employment. Across countries strong differentiation in girls opting for artistic and caring occupations and boys electing 'investigative', 'enterprising' or 'realistic' careers (Holland, 1997) is no longer the dominant pattern, although gender differences in career choices persist.

These results highlight the complexity of factors influencing adolescent career choices, which go far beyond matching personalities with occupations, as stipulated by the traditional theory of vocational choices. Firstly, while individual factors are very important in determining career plans, as they account for about 80 % of overall variation, systematic institutional influences impose constraints on the scope of this variation.

First, our analysis indicates that, most likely over time, the traditional perceptions of the gender-typed occupational choices have ceased being an accurate representation of what young women aspire to. Although we have no direct measures which would confirm the greater importance that adolescent females place on professional careers, we have shown evidence that girls are determined to enter many occupations formerly thought of as strongly preferred by boys. Where they opt for traditional caring and artistic occupations, their focus is more strongly on the professional end of the occupations' hierarchy.

The extent that these far reaching plans prevail among girls in different cultures and economic conditions is consistent with the influence of the globalised education model, as proposed by neo-institutionalists, which assumes gender equality and thus equal chances of entering professional occupations for all. Although the task of evaluating these gender patterns can be approached from many angles, it is vital, particularly from the policy point of view, to ask which type of pattern should be considered as desirable. Traditionally the less ambitious plans among girls have been seen as an indicator of the prevailing patriarchal structure of discrimination against females in both formal education and the labor market. Our data indicate that, for recent cohorts of high school students, the concerns over "boys lagging behind" might be warranted. Conversely, the very high levels of ambition among girls, where boys opt for more vocationally oriented careers, might be seen as a source of potential problems, both when girls are confronted with the realities of gender differentiation in labor market outcomes, and their individual decisions regarding balancing work and family.

To enable the policy makers to learn important lessons from the results of analyses, such as ours based on the PISA data, several issues need to be raised explicitly by future research. First, to what extent can gender differences in the desirability of professional careers among adolescents be interpreted as indicative of gender inequality in the transition from school to work? Should policies aim at gender neutrality in the formation of occupational plans, and if so, at which level of education and in what form should such a neutrality be sought? To understand this issue, gender segregation of adolescent occupational expectations needs to be taken into account together with the differentiation into professional, skilled and unskilled job destinations. Second, we need to know more about the dynamics of adolescent career plan changes at particular levels of education in each country. This is necessary to ascertain

whether systematic underreporting of occupational plans at 15 among boys is a signal that policy makers should be concerned about, or a sign that, regardless of socio-economic contexts, young men begin thinking about their careers later than young women. Finally we need more country specific research, based on longitudinal data for recent cohorts of high school graduates which could quantify the implications of early career plans formation for the actual occupational attainments to better understand how early plans transform into later advantage or disadvantage, if any. As this information becomes available in future studies, we should be in a better position to understand the global versus local determinants and implications of occupational plans among youth.

[Appendix Table 1 about here]

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Table 1. Average occupational expectations in ISEI scores by gender and by country (PISA 2006)*

	Nations	Girls			Boys		
		Mean	Std error	N	Mean	Std error	N
	Tunisia	71	0.33	2010	66	0.38	1620
	Jordan	69	0.28	2583	67	0.35	1874
	Turkey	67	0.31	1944	65	0.31	2029
Latin and South America	Colombia	70	0.32	2152	68	0.32	1756
	Brazil	70	0.26	3991	62	0.31	3101
	Uruguay	69	0.35	1971	61	0.42	1699
	Mexico	68	0.13	12619	67	0.15	10606
	Argentina	67	0.37	1913	61	0.44	1594
	Chile	66	0.40	1904	63	0.37	2132
Post-soviet countries (Asian and European)	Azerbaijan	72	0.33	1568	66	0.44	1516
	Kyrgyzstan	69	0.41	2186	64	0.51	1379
	Russia	66	0.34	2342	58	0.41	1950
	Lithuania	63	0.40	1755	57	0.43	1710
	Romania	62	0.37	2270	54	0.39	2179
	Poland	62	0.40	2214	56	0.39	2118
	Slovenia	62	0.34	2557	57	0.36	2317
	Estonia	61	0.43	1788	54	0.45	1799
	Latvia	60	0.40	1918	55	0.48	1538
	Slovakia	59	0.44	1749	54	0.43	1720
	Croatia	59	0.43	1748	50	0.39	1666
	Czech Rep	55	0.44	1777	51	0.37	2044
	Hungary	55	0.51	1436	51	0.48	1456
Southeast and East Asia	Indonesia	63	0.30	3613	60	0.29	3845
	Thailand	62	0.34	2602	58	0.47	1507
	Korea (ROK)	60	0.30	2321	62	0.28	2338
	Japan	56	0.37	1917	54	0.34	1926
Australia, Canada and New Zealand	Canada	64	0.18	8954	59	0.20	8375
	New Zealand	60	0.42	1913	55	0.46	1580
	Australia	58	0.23	5658	56	0.25	5509
Europe	Spain	63	0.21	7507	58	0.22	6611
	Greece	63	0.36	1870	59	0.39	1546
	Italy	63	0.19	8791	57	0.19	8660
	Iceland	62	0.52	1411	59	0.54	1290
	Portugal	63	0.41	2096	60	0.37	1837
	Ireland	59	0.41	1871	57	0.43	1768
	Norway	59	0.48	1553	54	0.48	1551
	United Kingdom	57	0.26	5222	56	0.25	4936
	Belgium	57	0.32	3228	54	0.31	3506
	Denmark	55	0.52	1379	53	0.47	1441
	Sweden	55	0.44	1752	52	0.41	1732
	Austria	54	0.44	1612	50	0.45	1578
	Netherlands	*54*	*0.39*	*2057*	*54*	*0.36*	*2047*
	Finland	53	0.46	1867	49	0.45	1589
	Germany	*52*	*0.46*	*1531*	*52*	*0.47*	*1444*
	Switzerland	*50*	*0.27*	*4581*	*49*	*0.26*	*4920*
	(N)			131698			121342

[1] Note: All estimates are weighted

*Countries are ordered approximately by geographic region and then by decreasing difference in expectations between girls and boys in PISA 2006. Except for Australia, all countries listed in Table 1 are included in the multi-level analysis in Table 3.

Estimates in bold print and italics are not significantly different between boys and girls within each country and surveys. Others are significantly different from zero at p = 0.01 within each country and survey.

Table 2. Twelve most commonly expected occupations (ISCO 1988) in countries with low (less than 54%) and high (over 70%) female labour force participation[A].

Girls			Boys		
Countries with female labour force participation lower than 54%					
ISCO		%	ISCO		%
2221	medical doctors	13.7	2221	medical doctors	9.0
2421	lawyers	6.8	2140	architects, engineers etc professionals	4.5
2300	teaching professionals	6.6	2421	lawyers	4.4
2321	secondary teachers, academic track	3.5	3475	athletes, sports persons etc associate professionals	3.4
2445	psychologists	3.2	2149	architects, engineering professionals not elsewhere classified	3.0
2320	secondary education teaching professionals	2.8	2300	teaching professionals	2.8
2230	nursing & midwifery professionals	2.8	2144	electronics & telecommunications engineers	2.4
2411	accountants and auditors	2.5	2411	accountants and auditors	2.3
2332	pre-primary education teaching professionals	2.3	2320	secondary education teaching professionals	2.1
2140	architects, engineers and similar professionals	2.0	1310	small enterprise general managers, businessman & traders	2.1
2451	authors, editors, journalists & other writers	1.7	2321	secondary teachers, academic track	2.0
2149	architects, engineering professionals not elsewhere classified	1.7	2132	computer programmers	1.9
Total		49.6			39.9
Total N[B]		33379			29126
Countries with female labour force participation higher than 70%					
		%			%
2221	medical doctors	8.0	7231	motor vehicle mechanics & fitters, bicycle repairmen	4.4
5141	hairdressers, barbers, beauticians etc workers	6.3	2221	medical doctors	4.4
3471	decorators & commercial designers	3.9	3475	athletes, sports persons etc associate professionals	4.0
2445	psychologists	3.4	2140	architects, engineers etc professionals	3.5
2421	lawyers	3.2	7124	carpenters & joiners	3.4
2451	authors, editors, journalists & other writers	3.2	5162	police officers, including: policeman, constable, marshall	2.8
2230	nursing & midwifery professionals	3.1	5122	cooks	2.3
2223	veterinarians	3.0	2141	architects, landscape architects, town & traffic planners	2.1
2300	teaching professionals	2.4	3143	aircraft pilots and associate professionals	2.0
2141	architects, landscape architects, town & traffic planners	2.4	7137	building electricians	1.9
3320	pre-primary education teaching associate professionals	2.1	1310	small enterprise general managers, businessman & traders	1.8
2455	film, stage actors & directors	1.9	2421	lawyers	1.8
Total		42.9			34.4
Total N		32818			25180

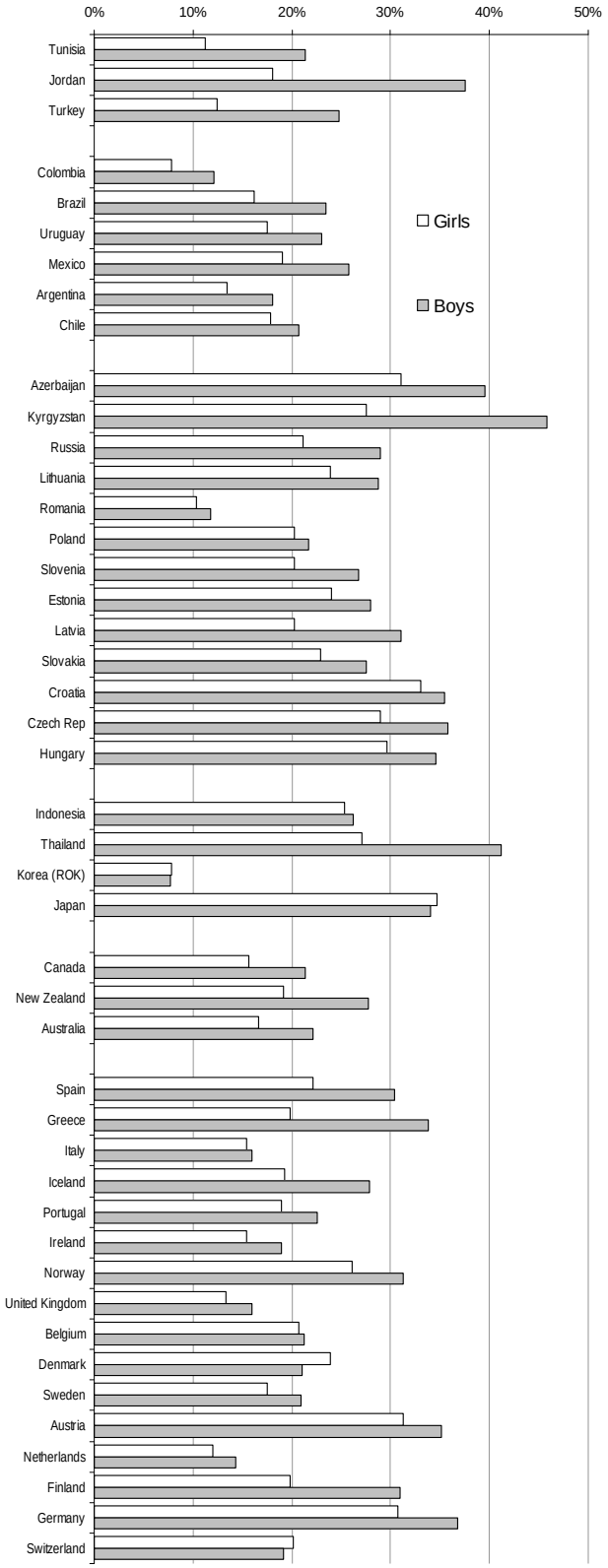
Source:PISA 2006, [A] Labor force participation rate, female (% of female population ages 15-64), [B] Number of all students

Table 3. Occupational expectations. Coefficients from three-level random intercept models with robust standard errors (PISA 2006).

	Model 1			Model 2		
	Coeff		Standard Error	Coeff		Standard Error
Fixed effects						
Country characteristics						
Gini	0.39	**	0.06	0.40	**	0.06
Proportion of women in labor force	-0.10	*	0.05	-0.10	*	0.05
School characteristics						
Parents' SES averaged by school	0.19	**	0.04	0.20	**	0.04
Proportion of girls at school	8.92	**	1.95	8.94	**	1.95
Private school	3.11	**	0.73	3.11	**	0.73
criterion	2.67	**	0.49	2.68	**	0.49
Computers connected to the Internet at school	0.94	*	0.49	0.94	*	0.49
School size	0.003	**	0.00	0.003	**	0.00
Size of town (millions of inhabitants)	1.54	**	0.35	1.54	**	0.35
Individual characteristics						
Male	-3.37	**	0.35	-1.63	**	0.31
Parents' SES (education & ISEI)	0.17	**	0.02	0.12	**	0.01
Studying in vocationally oriented program	-5.81	**	1.98	-5.12	**	1.35
Reading score (proxy for academic ability)	-		-	0.06	**	0.00
(constant)	59.41	**	0.58	59.41	**	0.58
Random effects						
Variance & [explained variance] at country level	12.4		4% [66%]	12.4		4% [66%]
Variance & [explained variance] at school level	44.3		15% [16%]	45.2		16% [14%]
Variance & [explained variance] at student level	246.9		81% [3%]	232.3		80% [8%]
[Per cent total explained variance]			[9%]			[13%]
Number of countries	44			44		
Number of schools	9940			9940		
Number of students	196735			196735		

** statistically different from zero at p=0.01,* statistically different from zero at p=0.05
All analyses weighted by the country factor computed so that each country contributes equally to the analysis.

Figure 1. Percent of students who did not answer the question about occupational expectations



Source: PISA 2006

Appendix Table 1: Occupational expectations by country: two-level random intercepts models (PISA 2006). Countries ordered by gender gap in career plans

	Male			SES			Reading Score			Vocational program			Parents' occupation in school (average)			Selective admission			Town size millions of inhabitants			(Constant)			Intraclass correlation	N
	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE	Coeff.	Sig.	SE		
Brazil	-7.4	**	0.4	0.00	ns	0.01	0.02	**	0.00	0a	·	0.00	0.05	ns	0.07	3.4	**	1.0	-1.1	*	0.5	59.5	**	4.3	0.05	7020
Uruguay	-5.8	**	0.5	0.06	**	0.02	0.04	**	0.00	-10.09	**	1.18	0.03	ns	0.17	-0.3	ns	1.3	-1.1	ns	0.6	48.7	**	10.8	0.09	3670
Russia	-5.4	**	0.5	0.17	**	0.02	0.05	**	0.00	-10.62	**	1.42	0.35	ns	0.23	1.1	ns	1.5	-0.5	ns	0.9	13.0	ns	15.2	0.09	4260
Argentina	-5.1	**	0.6	0.05	**	0.01	0.01	**	0.00	-3.11	ns	2.13	-0.35	ns	0.30	4.2	**	1.6	0.8	ns	1.0	79.5	**	19.7	0.08	3507
Azerbaijan	-4.9	**	0.5	0.07	**	0.02	0.03	**	0.01	-17.34	**	3.68	0.02	ns	0.25	0.4	ns	1.1	0.5	ns	0.8	52.4	**	16.3	0.05	3084
Estonia	-4.7	**	0.6	0.27	**	0.03	0.08	**	0.00	0a	·	0.00	-0.39	ns	0.26	3.2	*	1.4	0.6	ns	1.8	28.6	ns	16.9	0.05	3587
Romania	-4.1	**	0.5	0.12	**	0.02	0.04	**	0.00	-10.49	**	1.12	0.70	*	0.30	3.9	**	1.3	2.2	ns	1.1	-13.7	ns	20.0	0.11	4449
Kyrgyzstan	-3.6	**	0.7	0.07	**	0.03	0.04	**	0.00	1.55	ns	3.43	0.21	**	0.07	0.0	ns	1.3	-9.1	**	1.8	40.7	**	4.2	0.05	3550
Canada	-3.3	**	0.3	0.14	**	0.01	0.05	**	0.00	0a	·	0.00	0.00	ns	0.04	0.3	ns	0.6	2.8	**	0.4	22.3	**	2.5	0.05	17140
Poland	-3.2	**	0.5	0.25	**	0.03	0.08	**	0.00	0a	·	0.00	0.03	ns	0.18	-0.2	ns	1.1	-1.6	ns	1.3	3.5	ns	11.9	0.03	4332
Croatia	-3.1	**	0.5	0.09	**	0.02	0.05	**	0.00	-12.52	**	0.95	0.02	ns	0.32	12.3	**	2.7	0.6	ns	0.9	24.0	ns	20.6	0.15	3414
New Zealand	-3.1	**	0.6	0.11	**	0.02	0.07	**	0.00	0a	·	0.00	0.26	ns	0.21	0.0	ns	1.1	2.3	**	0.6	-4.5	ns	13.7	0.02	3493
Latvia	-3.1	**	0.6	0.15	**	0.02	0.06	**	0.00	-4.48	**	1.67	0.33	ns	0.25	2.9	*	1.3	3.8	*	1.6	-7.0	ns	16.1	0.04	3456
Tunisia	-3.0	**	0.5	0.01	ns	0.01	0.04	**	0.00	0a	·	0.00	0.04	ns	0.25	1.9	ns	1.0	-3.0	**	1.2	48.8	**	16.0	0.06	3611
Spain	-3.0	**	0.3	0.13	**	0.01	0.08	**	0.00	0a	·	0.00	0.00	ns	0.05	1.2	ns	1.2	1.2	*	0.5	11.8	**	3.2	0.04	14118
Italy	-2.5	**	0.3	0.10	**	0.01	0.01	**	0.00	-12.62	**	0.65	0.14	*	0.07	-0.9	ns	1.0	3.1	**	0.8	44.4	**	4.4	0.17	17423
Chile	-2.4	**	0.5	0.11	**	0.02	0.04	**	0.00	-2.75	ns	1.44	0.19	ns	0.25	5.4	**	1.2	-0.7	ns	0.7	26.6	ns	16.3	0.05	3988
Colombia	-2.4	**	0.5	0.06	**	0.01	0.01	**	0.00	-0.92	ns	0.63	-0.24	ns	0.17	2.2	**	0.8	-0.9	*	0.4	78.1	**	11.0	0.01	3907
Norway	-2.4	**	0.6	0.25	**	0.03	0.07	**	0.00	0a	·	0.00	0.33	ns	0.20	-3.6	ns	6.5	3.8	ns	2.0	-20.3	ns	13.3	0.02	3104
Lithuania	-2.3	**	0.6	0.12	**	0.02	0.06	**	0.00	-12.99	*	5.54	0.09	ns	0.04	-1.1	ns	1.1	1.3	ns	1.1	16.1	**	2.8	0.01	3465
Slovak Rep	-1.9	**	0.5	0.15	**	0.02	0.07	**	0.00	-5.01	**	1.15	0.19	ns	0.29	4.3	**	1.4	1.1	ns	2.9	1.4	ns	18.8	0.13	3463
Portugal	-1.2	*	0.5	0.12	**	0.01	0.07	**	0.00	-2.77	**	0.74	-0.03	ns	0.19	2.0	ns	1.1	-0.5	ns	0.8	27.3	*	12.5	0.02	3906
Sweden	-1.2	*	0.6	0.22	**	0.02	0.06	**	0.00	-8.09	ns	4.24	-0.02	ns	0.21	5.9	**	2.4	3.5	**	1.1	7.8	ns	13.9	0.04	3427
Turkey	-1.2	**	0.4	0.02	ns	0.01	0.04	**	0.00	-7.14	**	0.81	0.35	ns	0.25	-0.2	ns	1.0	-1.3	ns	0.7	26.8	ns	16.3	0.10	3913
Austria	-1.1	ns	0.6	0.12	**	0.02	0.03	**	0.00	-8.23	**	1.20	-0.22	ns	0.32	9.1	**	1.4	3.8	**	1.1	41.7	*	21.2	0.22	3190
Iceland	-0.9	ns	0.7	0.21	**	0.03	0.06	**	0.00	0a	·	0.00	0.25	ns	0.35	2.5	ns	3.0	5.3	*	2.3	-5.8	ns	22.6	0.05	2701
Japan	-0.8	ns	0.5	0.10	**	0.02	0.03	**	0.00	-4.28	**	0.98	-0.10	ns	0.24	1.6	ns	2.0	1.4	*	0.7	36.5	*	15.9	0.08	3843
Slovenia	-0.7	ns	0.5	0.07	**	0.02	0.04	**	0.00	-9.87	**	1.08	0.17	ns	0.17	2.9	*	1.3	1.5	ns	2.1	27.6	**	11.1	0.25	4874
Mexico	-0.7	**	0.2	0.04	**	0.01	0.02	**	0.00	-1.82	**	0.36	0.00	ns	0.02	0.9	ns	0.5	-1.6	**	0.3	57.0	**	1.3	0.08	23077
Greece	-0.5	ns	0.5	0.11	**	0.02	0.06	**	0.00	-8.64	**	1.06	0.18	ns	0.20	-0.4	ns	1.6	-0.9	ns	0.7	13.0	ns	13.4	0.05	3384
Indonesia	-0.4	ns	0.4	0.00	ns	0.01	0.02	**	0.00	-6.18	**	1.69	-0.10	ns	0.22	2.9	ns	1.9	2.4	ns	1.9	56.5	**	14.3	0.29	7309
Jordan	-0.3	ns	0.5	0.05	**	0.01	0.05	**	0.00	0a	·	0.00	-0.23	ns	0.15	-1.2	ns	0.7	-1.3	**	0.5	57.0	**	9.6	0.02	4457
Thailand	-0.2	ns	0.6	0.04	*	0.02	0.07	**	0.00	-3.88	**	1.26	0.04	ns	0.04	2.1	ns	1.2	-0.4	ns	1.2	24.2	**	2.4	0.05	4109
Czech Rep	-0.2	ns	0.5	0.20	**	0.02	0.07	**	0.00	-8.22	**	1.01	-0.21	ns	0.20	5.3	**	1.1	0.0	ns	1.0	18.3	ns	12.9	0.10	3777
Denmark	-0.1	ns	0.6	0.18	**	0.02	0.09	**	0.00	0a	·	0.00	0.10	ns	0.23	2.2	ns	1.8	-0.3	ns	1.4	-14.5	ns	15.0	0.04	2820
Ireland	0.1	ns	0.6	0.15	**	0.02	0.08	**	0.00	-6.84	**	2.33	-0.34	ns	0.23	3.1	ns	1.7	0.5	ns	0.6	27.2	ns	15.1	0.03	3639
Hungary	0.1	ns	0.6	0.08	**	0.02	0.05	**	0.01	-8.16	**	1.15	0.38	ns	0.32	14.4	**	2.0	-0.1	ns	1.0	-8.4	ns	21.2	0.14	2892
Australia	0.3	ns	0.3	0.12	**	0.01	0.09	**	0.00	-5.99	**	0.52	-0.03	ns	0.07	1.4	*	0.7	1.6	**	0.3	4.4	ns	4.6	0.02	11167
UK	0.7	*	0.3	0.08	**	0.01	0.08	**	0.00	0a	·	0.00	-0.12	ns	0.07	1.1	ns	0.8	4.3	**	0.5	11.9	*	4.9	0.05	10158
Finland	1.0	ns	0.6	0.21	**	0.02	0.09	**	0.00	0a	·	0.00	0.08	ns	0.24	0.9	ns	1.7	3.8	*	1.9	-22	ns	16.0	0.03	3456
Belgium	1.3	**	0.4	0.08	**	0.01	0.05	**	0.00	-12.00	**	0.53	0.40	**	0.15	0.5	ns	0.9	4.8	**	1.5	-0.2	ns	9.8	0.09	6714
Netherlands	1.5	**	0.5	0.07	**	0.02	0.06	**	0.00	-5.86	**	0.72	0.09	ns	0.22	2.4	ns	1.3	5.4	**	1.7	11.2	ns	14.8	0.09	4104
Switzerland	1.7	**	0.4	0.17	**	0.02	0.05	**	0.00	-2.50	ns	1.31	0.16	ns	0.09	2.2	**	0.7	12.8	**	1.8	-1.7	ns	6.1	0.09	9474
Germany	1.9	**	0.6	0.19	**	0.02	0.06	**	0.00	-2.57	ns	2.62	0.07	ns	0.24	4.6	**	1.1	1.4	ns	1.0	-3.1	ns	15.4	0.09	2971
Korea	3.6	**	0.4	0.09	**	0.02	0.05	**	0.00	-3.70	**	0.69	0.21	ns	0.16	0.5	ns	0.7	0.2	ns	0.5	11.8	ns	10.7	0.03	4659

** significantly different from zero at p=0.01; **significantly different from zero at p=0.05; 0[a] variable not available