

8th European Conference on Gender Equality in Higher Education
Vienna University of Technology, Vienna, AUSTRIA – September 3 – 5, 2014

PANEL: Gender-sensitive teaching at school a basis for a successful college career?

Chair: Angela Wroblewski, Rapporteur: Dagmara Seta

Wednesday 3 September, 09:00 - 10:30

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Contribution: Quantitative Information about sex and gender issues in the Austrian National Education Report - overview and assessment

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Abstract Body: This paper is a contribution to the planned panel about '*Gender-sensitive teaching in school - a basis for a successful college career?*' In 2012 the second version of a national report about schooling in Austria has been published (Engl. https://www.bifie.at/system/files/dl/NBB_en_Band_3_web.pdf). The paper will give an overview about how issues of sex and gender are taken up in this kind of reporting, and will also discuss the information given in a broader context of equity.

The following topics are of broader interest:

- Participation of female and male children and youth in the tracked and segregated Austrian system: differences are much more marked with respect to specialisations in vocational education and training (VET) than concerning levels in the tracking structure (the occupational distribution will be discussed more deeply)
- There are big differences in interests and achievement between male and female children and youth concerning the different domains of mathematics and language
- Among teachers a strong process of 'feminization' has taken place, as in most other countries, with contradictory implications, as on the one hand the teaching occupation is a relatively well positioned one for females, and on the other hand, tied to the broadly 'half-day'-organization of schooling, this organization also supports the sex and gender inequalities in the employment structures
- The segregation among pupils is also reflected in similar segregation structures among teachers, which might be interpreted as constituting more 'pooled' structures of sex and gender oriented occupational groups, which are self-stabilizing
- There are specifically strong sex and gender differences concerning the Math-Inf-Science-Tech (German: MINT) subjects, which are taken up as challenge also by industry representatives, however, seem not easy to change in the Austrian structure.

The assessment will discuss firstly the quality of the reporting (and ask about which issues seem underdeveloped, and why), and secondly ask some more explanatory questions, and present also some hypotheses which might be supported by the data:

- To which degree might the segregation be attributed to be reproduced by structural features of the education institutions?
- How might the sex and gendered structures among teachers and pupils be related to issues of achievement?
- To which degree must the sex and gender differences in schooling be attributed to broader patterns in society and the structures of employment and social security?

A more political issue seems the new discourse about the disadvantages of boys and male youth as compared to girls and female youth, and the 'intersectionality' of disadvantage, in particular in relation to migration.

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1. Introduction

In 2012 the second version of a national report about schooling in Austria has been published (Engl. https://www.bifie.at/system/files/dl/NBB_en_Band_3_web.pdf). The full version of the report (in German) comprises three volumes (1: data and indicators; 2: thematic analyses; 3: summary). The report does not include a separate chapter about sex and/or gender issues. Thus topics of gender-sensitive issues are not covered specifically. However, there is much information about distributional aspects included in the quantitative volume, and the chapter about vocational education has posed gender issues as a main challenge for Austrian policy. A specific chapter analyses inequalities and covers gender as well as social and family background, migration, and the regional dimension. Gender has comparatively low and mixed effects. The estimations show from the beginning (grade 4) for females better results in language achievement, with a rising advance, and worse results in math with a shrinking detriment during compulsory school (grade 8). Following compulsory school, females show a higher proportion of transitions to advanced educational careers, and the employment of mothers do not show clear effects on achievement. High educational aspirations of girls are (speculatively) mentioned as a main explanatory dimension with respect to the overall slight advances of girls/female youth; the current fears of a strong or rising disadvantage of boys/male youth are not really supported by the estimations, however, the estimations regarding 'Bildungs- and/or Kompetenzarmut' show that males are more frequently affected by these Problems (Bruneforth, Weber & Bacher 2012).

The paper gives an overview about how issues of sex and gender are taken up in this kind of reporting, and discusses the information given in a broader context of equity. The issues of gender sensitive teaching are not easily covered by this kind of quantitative information. If we assume the well known dictum that only measurable aspects are manageable, this would be not a good message, however, the question remains, to which extent the democratic imperatives of equity and equality can and should be politically transformed into 'manageable problems', and what sensible alternatives to this strategy could be.

From a broader (theoretical) point of view the inequalities in the education system seem primarily to reflect the structures in wider society through channels that cannot be influenced very effectively by even very strong policies and measures within education alone. Sufficient emphasis must therefore be given to the analysis of those channels that structure education according to the deeper societal and cultural traits.

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2. Quantitative information about sex and gender issues in Austrian education

The following overview is somehow focused on issues in vocational education which have been specifically analysed by the authors (Lassnigg & Laimer [now Kulhanek] 2013), and gives also some information from the quantitative volume of the Austrian report.

2.1. Segregated participation in vocational education

If we look at participation of females and males in Austrian education, we see a contradictory picture. Females had historically much lower (formal) education levels; however, have superficially very much caught up among younger cohorts (see Fig. C1.b-f, Bruneforth & Lassnigg 2012, pp.65-69). Recently their proportion in upper level schools and in higher education is even above males. If we look more specifically into the specialisations in vocational as well as in higher education, we can see a very segregated picture.

In a comparative perspective the Austrian education and training system has a specific structure, comprising

- a rather late start of compulsory schooling (age 6; recently early childhood education has been further expanded to five years olds, however, participation in institutional childcare is comparatively low for young children),
- early tracking at age ten into a common (HS-Hauptschule) and an 'elite' (AHS-Allgemeinbildende Höhere Schule) track of compulsory schooling,
- followed by an early beginning and tracked 'dualistic' system of vocational education comprising apprenticeship and fulltime vocational schooling at about equal proportions, beneath the upper secondary track of the 'elite' academic school (AHS)
- and a university dominated higher education system with (almost fully) guaranteed access rights to university for graduates from the upper level schools ('Matura'-Examination), including a small polytechnic sector, and a tracked teacher education (university for 'elite' schools and institutes for 'common' schools)

The 'dualistic' vocational education comprises two sectors,

- (i) firm-level apprenticeship starting after compulsory school at age 16 without formal achievement requirements, and
- (ii) fulltime institutions starting at age 15 within compulsory schooling, the latter being tracked to intermediate (BMS, Berufsbildende Mittlere Schulen, 3-4years) and upper level institutions (BHS, Berufsbildende Höhere Schulen, 5years), and scattered to different sectors with (intermediate) health schools not being formally integrated into the overall system.

Apprenticeship includes separate part-time schools (BS, Berufsschulen) and is organized by hundreds of training occupations. The full-time school sector comprises occupational sub-sectors, mainly

- (a) trades and engineering ('Technisch-Gewerblich'),
- (b) business ('Kaufmännisch' and

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- (c) services ('Wirtschaftsberuflich'),
- (d) educational/social, as well as with still separate jurisdictions:
- (e) agricultural ('Land- und Forstwirtschaftlich) and
- (f) health services schools.

Two structural aspects must be specifically mentioned concerning the school sector: the first is that the upper level schools (BHS) successfully provide university access, the second is that the 'service occupation schools' (c-category above) have been created out of the schools that were historically the schools for 'women's occupations', primarily including also the (private) household education. These institutions are still struggling for finding a firm hold in the occupational system with moderate success, however, are providing through their upper level track also university access for female youth, who (respective whose parents or families) might be rather traditionally oriented at ages around 13 or 14.

Figure 1 shows that even in quite a raw classification there are not only differences in participation, but that these differences are extreme, with the proportion of female students varying between 95% in early childhood 'teacher' institutions and 14 to 21% in the trade and engineering institutions. If we take more fine-grained classifications we can compare the sex-distribution in specialisations with the distribution of students, and identify proportions of 'female', 'male', and 'mixed' specialisations. Figure 3 gives an overview about these distributions among 552 categories of educational specialisations at grade 10 (the first year after the end of compulsory schooling), whereby the proportion of female students is simply distinguished by zero to one third ('male' specialisations), one third to two thirds ('mixed' specialisations, with a sub-category around 50% between 45 and 55% of 'equal' specialisations), and two thirds to 100% ('female' specialisations). We can see that less than 10% of specialization are 'equal' and only about one quarter are 'mixed'. Almost half of specialisations are 'male' and a bit more than one quarter are 'female'. Figure 4 shows the distribution of female and male students to these categories of programmes. First, a very small proportion around 5% of students learns in really balanced programmes with more or less equal distribution; secondly, we see that in each sex the distribution of students in programmes of their own sex, mixed, and of the opposite sex is around 60% : 30% : 10%, with males learning a bit less in mixed programmes, and a bit more in those from their own and from the opposite sex (62:27:11%), and females a bit more in mixed and less in specified programmes (56:35:9%); thirdly, in the medium term 2006-10 we can see very little change of this distribution.¹ The National Education Report 2012 (Vol.1 pp. 70-73, Indicator C1.6) has taken up this calculations. This indicator reinforces the facts that information technology and engineering programmes are around 90% male, whereas education and health are around 90% female; agriculture is more than 50% male, and arts and services are more than 50% female; only in the business field more than 50% of students are learning in programmes with a mixed sex distribution. The indicator also underlines that the apprenticeship sector is more strongly segregated than the fulltime school sector.

¹ Based on this kind of analysis, one of the efficacy indicators of the education ministry in Austrian government policy has been selected; see the accompanying study Lassnigg 2011.

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Figure 1²

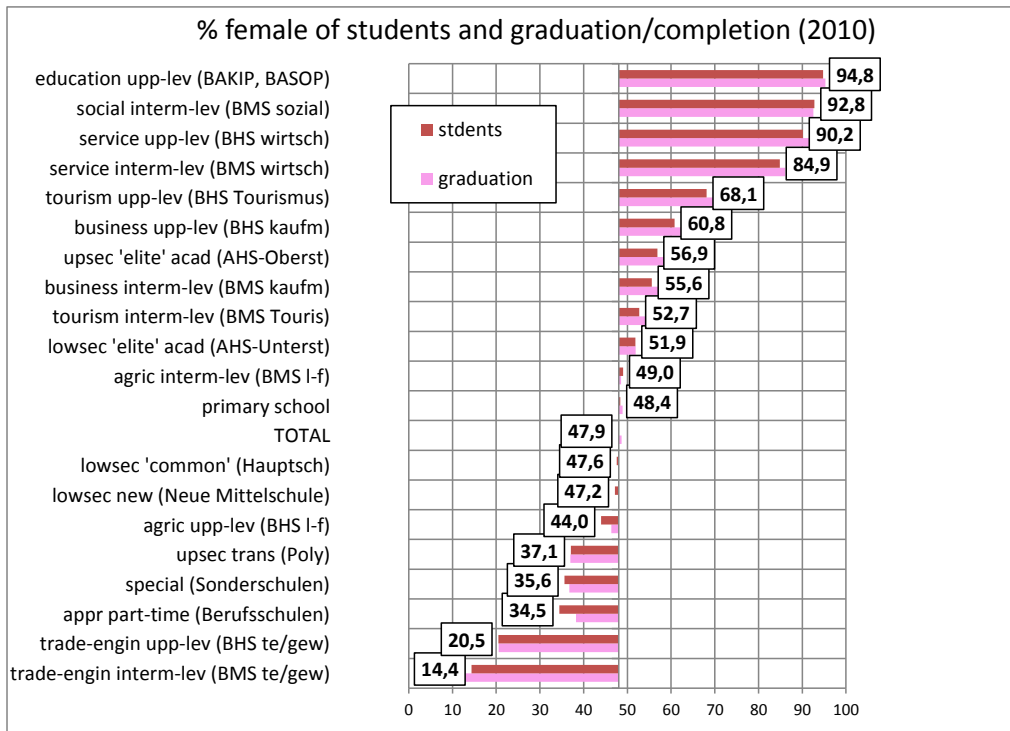
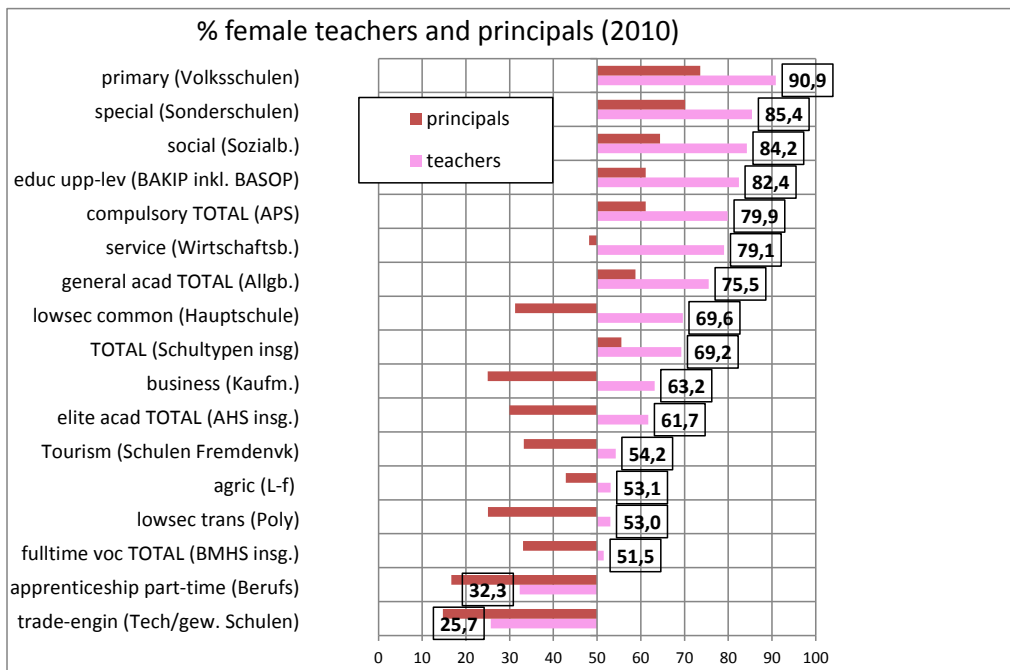


Figure 2



Source: Lassnigg & Laimer [Kulhanek] 2013

² It must be mentioned, that health schools are under a specific jurisdiction in Austria, and hence are not regularly included in these kinds of statistics. This sector is, however, very important for female education and employment, and also for segregation.

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Figure 3: Distribution of 'female', 'male' and 'mixed' educational programmes at grade 10

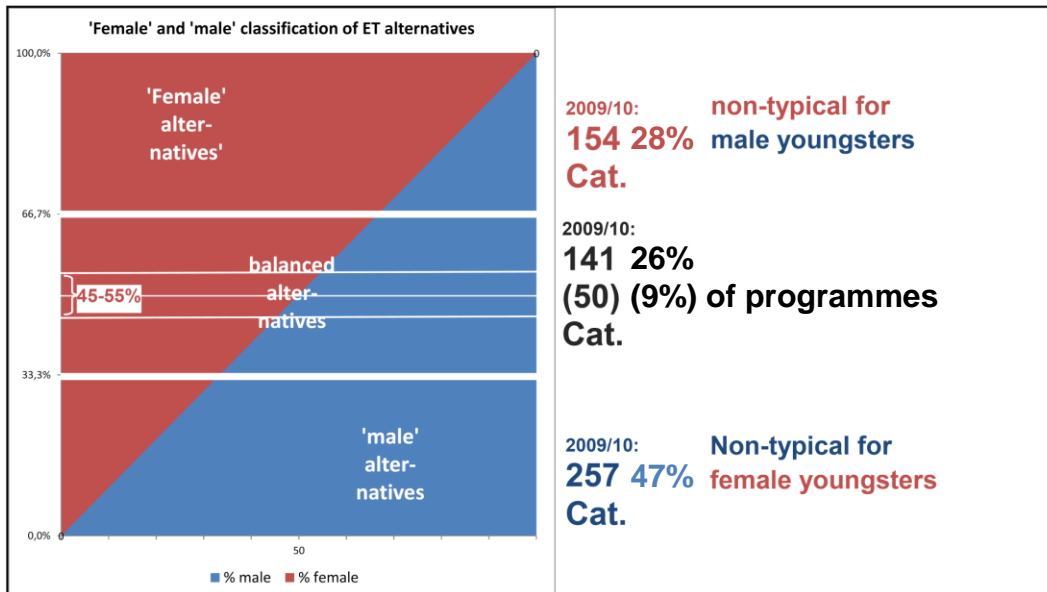
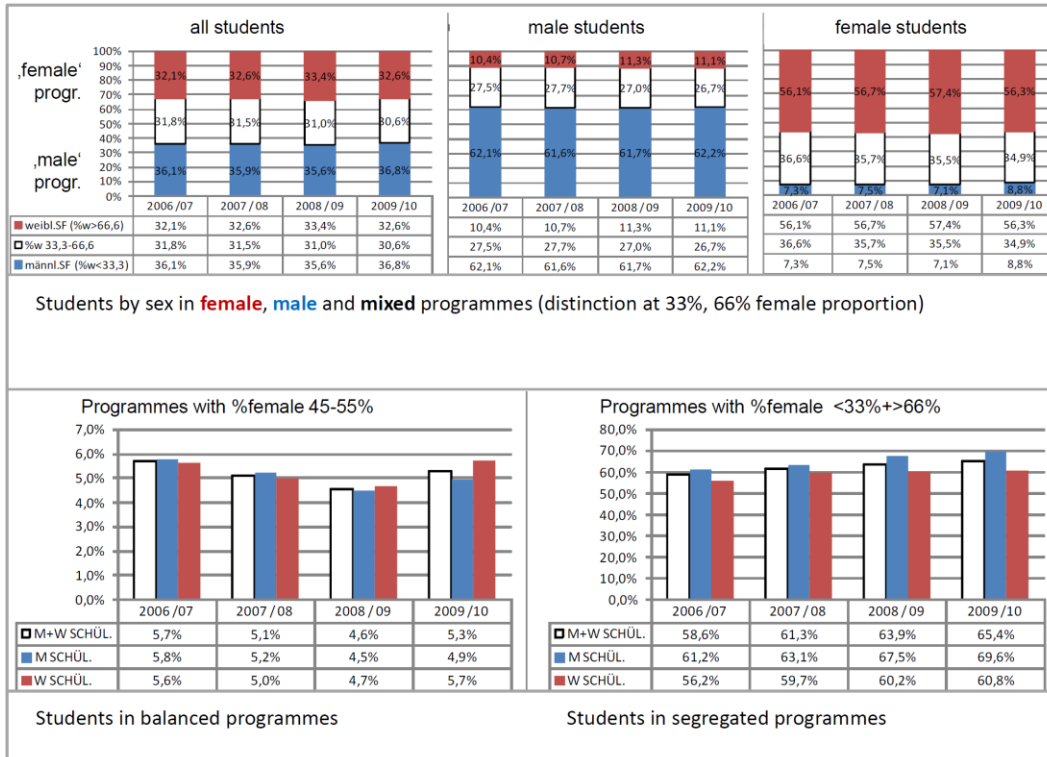


Figure 4: Distribution of 10th grade students to 'female', 'male' and 'mixed' educational programmes



Source: Lassnigg 2011

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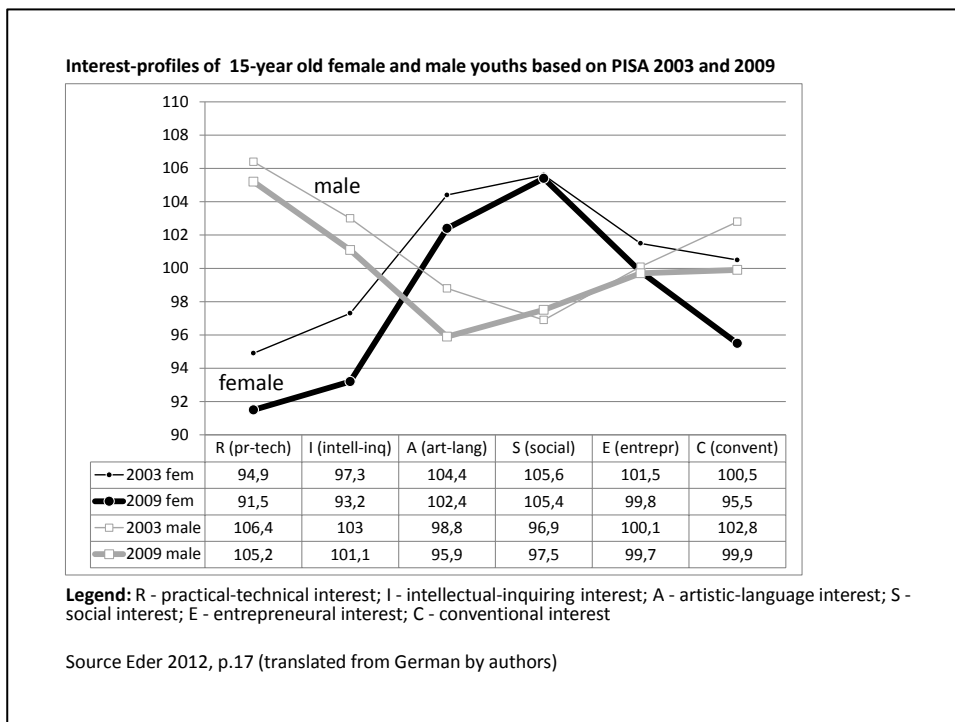
If we look at the biggest gender-specific occupational specialisations, the basic structure is clearly signified. Among females the five biggest 'female' programmes are the former women's schools at upper and intermediate level, hairdressing, and early childhood educators (all 27 biggest 'female' programmes are in the occupational fields of former women's schools, health, textiles-fashion-cosmetics, social services); among males the biggest specialization of male specific programmes is the upper level full time engineering school followed by five apprenticeship programmes in construction and engineering (all 35 biggest male programmes are in these fields of engineering, construction, electricity, and electronics).

2.2. Differences in interest and achievement

We have already shown the gender specific differences in achievement, with females achieving better in literacy (reading/language) and males better in numeracy (math).

These differences are somehow echoed by differences in the interest profiles. Figure 5 presents differences according to the 2003 and 2009 PISA testings among 15-year olds. The differences follow quite clearly what can be expected from gender specific prejudices. Young males score higher on practical-technical (+13) and intellectual-inquiring (+7) interests, whereas young females score higher on arts-language (+6) related and social (+8) interests; entrepreneurial and conventional interests are more similar (1-4 points difference).

Figure 5



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2.3. 'Feminization' of teachers

Among teachers a strong process of 'feminization' has taken place in Austria, as in most other countries, with contradictory implications. On the one hand the teaching occupation is a relatively well positioned one for females, and thus supports comparatively good employment opportunities for women. In this respect the feminization of a well-positioned occupation provides quantitatively rising opportunities for women, however, there are also theories that indicate a deterioration of the position of an occupation by too much rising proportions of women. Therefore there are strong arguments for a more equal distribution based on occupational interests, which are also supported by the view that the young generations should be educated by both sexes. Figure 2 shows the proportion of female teachers by available categories of schools, which also has a broad range between 91 and 26%. Figure 6 shows a scattergram of these proportions across the whole system. In compulsory schooling the sex distribution of students is about equal, however, the proportion of female teachers is substantially higher (70% and above); particularly high is it in schooling for young children (primary schools). See also Fig B4a in Bruneforth & Lassnigg 2012, p.47 which shows the age pyramid for female and male teachers. Between ages 59 and 53 in 2010, which indicates grossly the inflow years during the 1970s, the female teaching workforce shows a sharp increase compared to men (+87% vs. +15%), and the proportion of female teachers has totally increased from 60% to 70%. We see also a marked difference in the proportion of female teachers between the markedly more prestigious university educated 'national teachers' at upper level schools ('BundeslehrerInnen': 46 to 57%) and the less prestigious not university educated 'federal teachers' at compulsory schools ('LandeslehrerInnen': 66% to 77%). We also see that the change in the proportion of female teachers (+11 percentage points) during this expansionary period of the 1970s has already reached the average proportion in 2010, which is 58% among national and 77% among federal teachers (see Table A1 in Annex).

The Austrian school structure, including the organizational practices of a 'half-day' school in compulsory schooling are echoing very much the traditional household structures, as the teachers are free to organize half of their working time separately from their workplace at school. Thus organising their household is very much easier compared to a full working day in the workplace. Thus a key part of the (middle-class) female workforce has the opportunity to organize the household and family life in a traditional way. As schools play also a key role in the family life of other people, the teachers can structurally play a role as multipliers in reinforcing traditional household and family practices. If we also consider the well-known patterns of marriages and family creation, that imply a tendency of coupling (a bit) more educated men with (a bit) less educated women, the working conditions of female teachers can provide favourable conditions for relatively affluent middle-class couples living traditional family patterns and thus also stabilizing traditional habits among husbands who might thus also function as stabilizing multipliers (see for an empirical analysis of these relationships Lassnigg). Overall, this structure of the female teaching workforce combined with the half-day school organisation works through many channels to stabilize and reinforce the sex and gender inequalities in the employment structures and in society.

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Figure 6: % female students X % female teachers by categories of schools

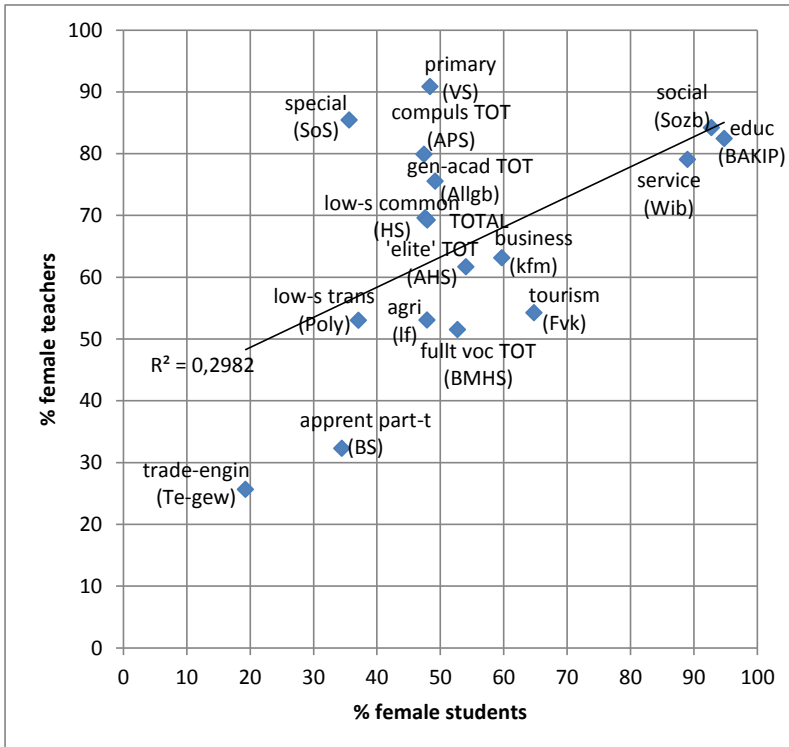
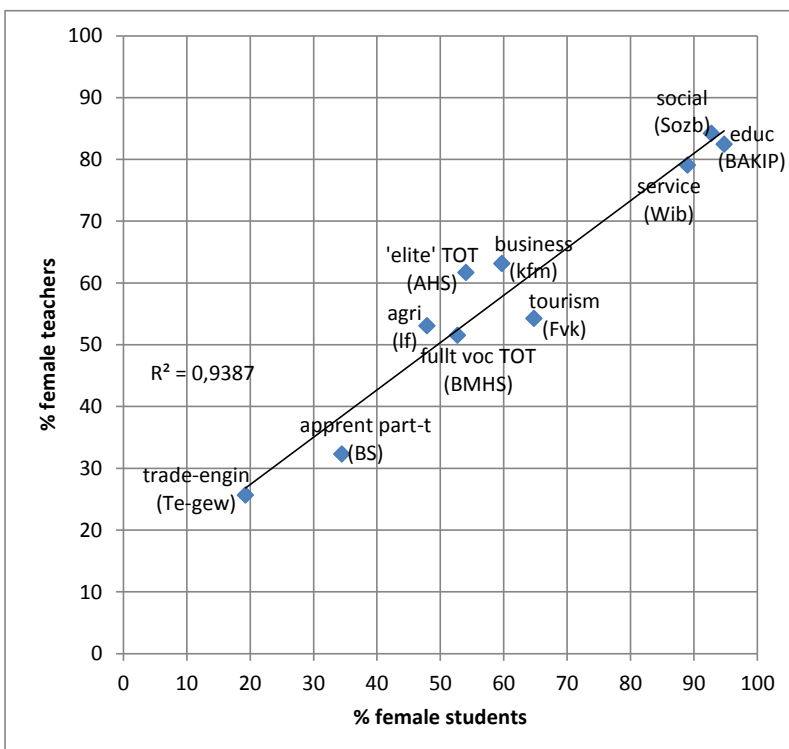


Figure 7: % female students X % female teachers in vocational education by categories of schools



Source: own figure based on Lassnigg & Laimer [Kulhanek] 2013

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Figure 8: female teachers X female principals (compulsory and vocational education)

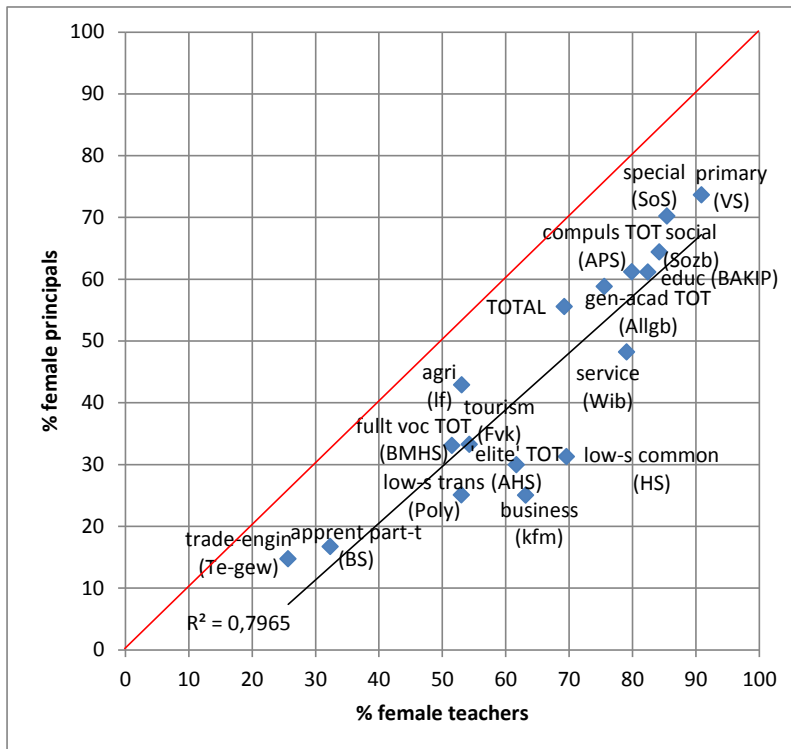
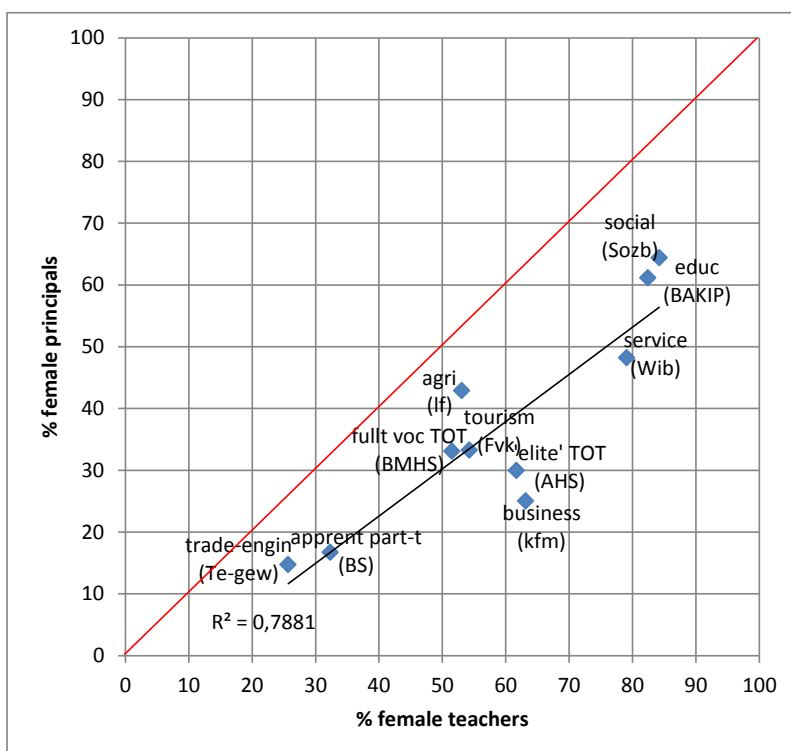


Figure 9: female teachers X female principals (vocational education)



Source: own figure based on Lassnigg & Laimer [Kulhanek] 2013

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The proportion of female teachers is on average about 20 percentage points higher compared to the principals, with a slightly rising difference with rising female shares among teachers. Figures 8 and 9 show this relationship. In vocational schools in business occupations and in the lower secondary 'common' school (less so in the 'elite' academic track) the proportion of male principals is slightly higher than expected by the regression line.

2.4. Segregated 'cultures' in occupational fields

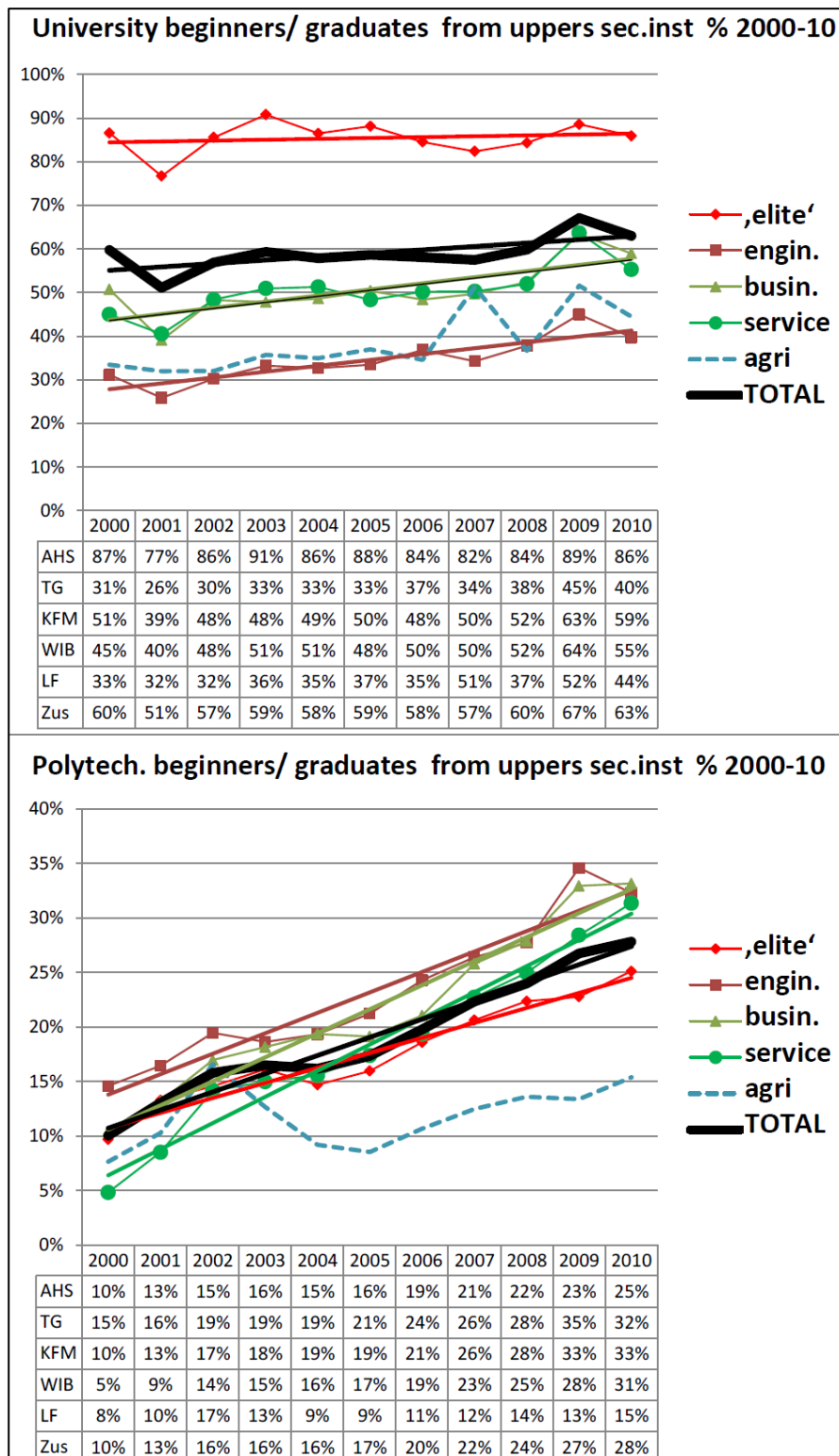
The segregation among pupils in vocational education is reflected in similar segregation structures among teachers, which might be interpreted as constituting a kind of 'pooled' structures of sex and gender oriented occupational groups, which are self-stabilizing. Figure 2 shows that in vocational education the proportions differ, and that there is strong relationship between those distributions. Figure 7 displays a correlation of .93, with grossly three groups of schools, 'male' (trade/technical schools and apprenticeship part-time schools), 'female' (educational, service and social schools), and 'mixed' (business and agricultural schools).

This self-stabilising structure can be hypothesized particularly in the 'male' trade and engineering field, and in the 'female' educational and social work fields, where the vocational schools are rather strongly related to the occupational field. A more specific situation can be hypothesized in the field of the former women's schools (service), which are not so strongly related to an occupational field, and provide university access to their graduates. Together with the business schools the study choices of these graduates at universities are quite mixed, about 30% in business-economics-social-sciences, about 25% in humanities, 15% law studies, 20% science and technology, and 10% teacher studies; compared to the overall distribution, there is less choice of science and technology, and more choice of business-etc. Only for the polytechnic access we can differentiate between graduates from business and service schools. Here the general pattern of less technology and more business prevails, with the service school providing more choices of health studies and even less science and technology studies (see Lassnigg & Laimer 2013, pp. 45-46).

Since decades a main policy approach has been to support access of women into male occupations ('Frauen in Männerberufe'), however, as we can see the results are not very much visible. In addition, a big evaluation in the 1980s has already shown that even women who have completed such a programme, often preferred to work in a 'female' occupation afterwards (Spitzzy, Pelz & Wagner 1986). Another approach could be, to develop the 'female' programmes towards an increase of equity/equality.

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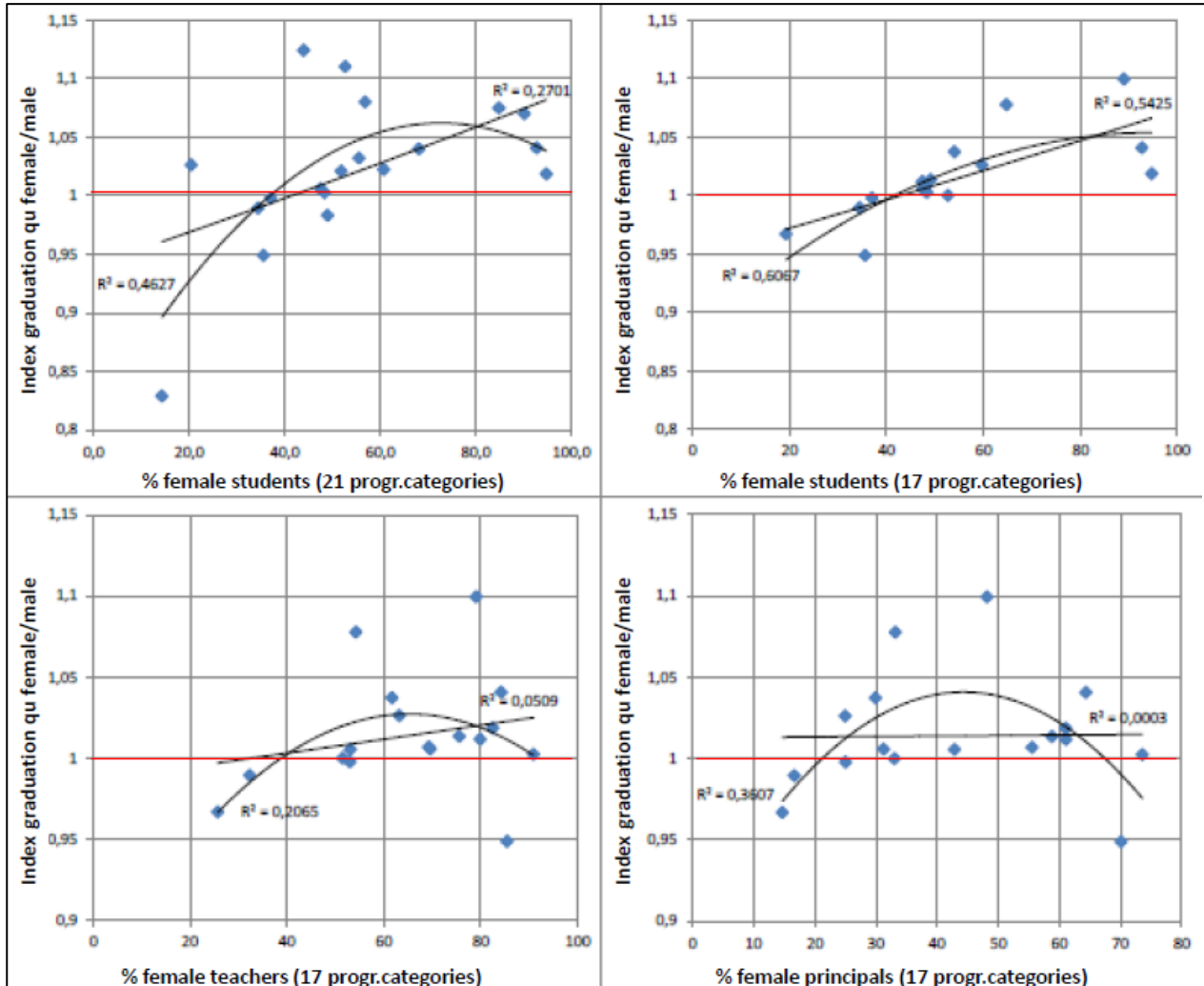
Figure 11: Transition from vocational education to higher education



Source: Lassnigg & Laimer [Kulhanek] 2013

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Figure 12: Female/male graduation quota X % female students, teachers, principals



Source: own figure based on Lassnigg & Laimer [Kulhanek] 2013

With the data available we can make a superficial exploratory look, whether the sex distribution in the programmes are related to the output of the programmes. For this purpose we compare the proportion of female/male completion quota of the programme types related to their sex distribution (Figure 12). The correlations do not indicate a straightforward relationship. However, some hypotheses can be derived from these graphs. First, the linear regressions might indicate a positive relationship between female success and proportion of female students, but not with the proportions of female teachers or principals. Second, the relationship with the students' proportion is sensitive according to the classification, with a less stronger positive correlation in the more differentiated classification. Third, a curvilinear modelling shows in every graph a higher coefficient, in particular if we look at the teachers and principals variables. Thus these exploratory analyses indicate that a more balanced sex distribution might lead to relative better output for females than a segregated one, independent from the direction of segregation.

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2.5. Systemic issues

We have presented various indications for sex and gender segregation in the Austrian education system, indicating the wide variation of the female/male proportion among students in vocational education, its reflection in teachers and principals and the high degree of feminization of teachers in particular in early and compulsory education, and indications that a balanced mixture might be rather favorable for the success of female youth in terms of the output than segregated patterns.

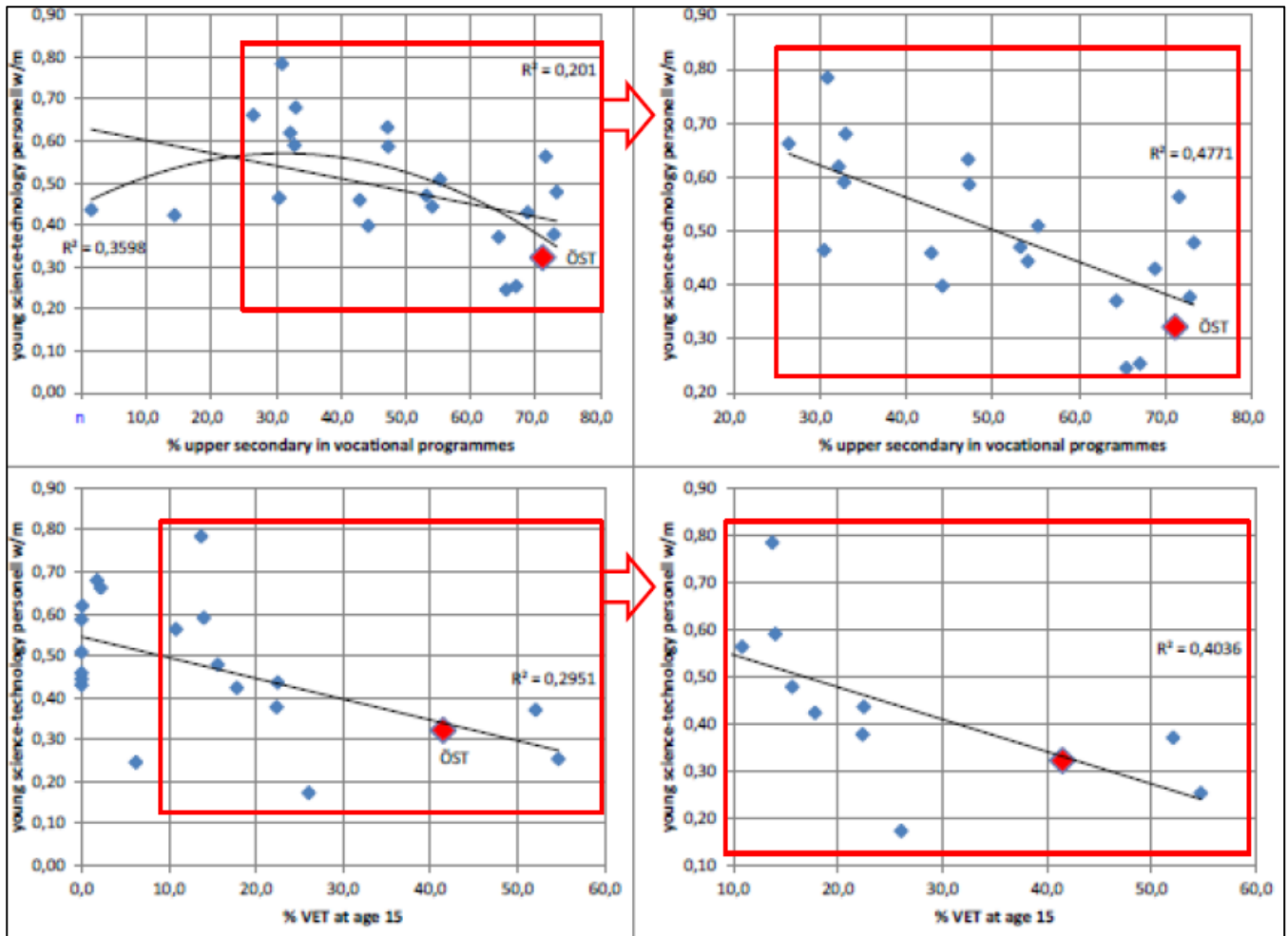
Young females are in particular underrepresented in technology related programmes, and they also indicate relatively less interest in this field. If we look at a comparative indicator of the sex-relationship among young employees in science and technology, we can see a wide range of the proportion of women to men between 0.2 and 0.8 in 22 OECD countries. There are always less women than men in this field, however, the wide range shows clearly that there cannot be a 'natural' relationship. So there must be factors to explain these differences. This is important, because it is quite clear that competences in this field will be strongly needed in the economy and society in the future.

Earlier analyses have indicated that early vocational education might channel young people prematurely into certain occupational fields following quite traditional patterns of division of labour (Lassnigg 2004). Figure 12 shows that the proportion of vocational education among young people seems to be related to the proportion of males and females in science and technology occupations: the more young people participate early in vocational education, the more young men are quantitatively predominating over women in science and technology employment. If the participation in vocational education at the upper secondary level is about 30%, there are 4-8 women per man in the young science technology personnel, if the participation in vocational education is about 70%, only 2-6 women per men are available in this field. The participation in vocational education at age 15 according to PISA points to a similar relationship: in the countries with low vocational education (0-20%) 4-8 women per man are in the science and technology personnel, whereas in the (few) countries with higher participation in vocational education at this early age there are only around 3 women per man in the science and technology personnel. Austria is in both perspectives quite paradigmatic with comparatively high participation in vocational education, and among the lowest representation of women in science and technology.

In sum, the overall pattern of the Austrian education system might reinforce traditional patterns of the sex and gender specific – seemingly 'natural' – 'division of labour'. The feminization of teachers might reinforce that traditional patterns of division of labour in the family, and the gender specific segregation of 'male' and 'female' occupational fields might reinforce the traditional occupational patterns. Given these strong structural channels, interventions in the educational processes and practices cannot be expected to exert strong effects.

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Figure 13: participation in vocational education X relation f/m among young science-technology personnel



Source: own figure based on Lassnigg & Laimer [Kulhanek] 2013

3. Discussion

3.1. Quality of the reporting with respect to sex and gender

The 2012 report had the issues of migration selected as its thematic focus, where much important new information has been generated and published with an 'official' emphasis. A critical reflection shows that this focus might have (unintendedly) led to an under-emphasis of sex and gender issues. Tab.1 gives an overview about the number of figures/tables in the report by thematic sections, and shows how sex/gender breakdowns are included. Some observations stand out:

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Table 1: Breakdowns by sex/gender in Vol.1 report

	Sum	Breakdown sex/gender	%	One dim. breakdown	%
A context	15	0	0%	0	0%
B input	28	2	7%	0	0%
C process	43	13	30%	4	9%
D output	35	17	49%	1	3%
E transition	9	6	67%	3	33%
F outcome	13	8	62%	0	0%
Figures total	143	46	32%	8	6%

Source: own classification based on the Excel-Table of Vol.1
https://www.bifie.at/system/files/buch/pdf/NBB2012_Band1_Grafiken.xlsx

- only one third of figures/tables include breakdowns, and the proportion increases substantially towards the outcome measures
- breakdowns are mostly one-dimensional (i.e. part of the breakdowns shows them in parallel to other variables), thus issues of intersectionality are mostly not covered; this applies in particular to migration, or to special schools
- on several occasions it has to be said that sex/gender specific data are not available (e.g., in the figures/tables about international comparisons), or sometimes not feasible (e.g. aggregate demographic, or economic indicators)

Concerning improvement of the quality of reporting, we can propose to think over some basic issues, to which solutions are not obvious, however, should be thought over: First the disproportion of input and process indicators on the one hand, and output and outcome indicators on the other indicates, that we know more about the sex/gender specificity of results than about the factors that contribute to the results. In particular the input dimension includes very little specific information. In some parts, e.g., teacher education, it could be relatively easy to provide breakdowns, however, in other parts it seems more difficult, or unconventional to provide breakdowns (e.g., pupils per class, or pupils per teacher, or financial figures). Concerning the financial inputs, questions of gender budgeting could be raised; it seems interesting, whether the financial means are disproportionally distributed to female students, and maybe also female teachers, or 'male' and 'female' environments. Second, the process dimension would be specifically related to the issues of gender sensitive teaching. However, when we inspect the available indicators, they are giving only very abstract impressions about the processes of teaching. About half are only about progression processes, where females often achieve better, with some contradictory aspects also. Males are still more often offenders and victims of aggression, however, females have already caught up at both sides to some extent. Information about teaching and learning practices is very scarce, and mostly not broken down by gender. Female teachers prefer a little bit more 'constructivist' teaching modes giving students a more active role than 'traditional' teaching (the overall distributions of this variable seem not very instructive). Finally, a kind of specific summary about what the indicators can tell about sex- and gender-specific differences or inequalities could be feasible in the report, where the different kinds of information are brought together. This exercise would also more clearly point to gaps in the information, and this overall view could also give a balanced picture about the issues of 'male' and 'female' disproportions.

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3.2. Some explanatory questions and hypotheses

Finally, we summarize some questions and hypotheses that come up from the empirical indicators. Basically the question might be raised, why the issues of segregation and of different interests and ‘preferences’ should pose a problem at all. Sweden might be cited as an example, where – at least during some historical phases – the struggle for equal opportunities was combined with a strong segregation. In the current political rhetoric, functional arguments prevail, which can be to some degree underlined. The rhetoric is very much related to the important role of information and communication technologies, which are seen as a key driver of the future development of the economy and the society (see Frey & Osborne 2013; or the much cited work by Brynjolfsson & McAfee 2011). On the one hand the projections show that much of the work done by low or medium qualified women could disappear during the next decades through automation, on the other contributing to this process could provide opportunities. A second point is the question, to which degree the early ‘choices’ can be really classified as balanced choices between alternatives, or whether they are somehow driven by factors beyond the control of the young people. There is much theoretical and empirical research in this realm, not completely conclusive, and to some degree still driven by ideological beliefs on the researchers’ side. Notwithstanding, it is quite clear from an empirical standpoint that the segregation processes, and particularly the ‘choice’ between extended family responsibilities and work, provide quite substantial economic losses for women. Arie Bovenberg has summarized this by a threefold destruction of women’s competences, first by unbalanced educational choices because of expected family responsibilities, second by the temporal withdrawal from employment because of taking these responsibilities, third by accepting employment below competence levels because of time constraints and depreciation of qualifications.³ Third, there are questions concerning democratic politics and the structures and policies concerning the social system and the basic institutional framework of the welfare state. It appears clear today that the seemingly very personal choices of building a family and how to rear children is related to the support and incentive structures of the social system and related politics and policies, based on political ideologies (see annex figures A1-3 for a stylized account around 2000, based on Bovenberg 2008). If we consider that the first child is given birth at age 29 or later, what do the answers of young people at ages 15-24 in the official ‘Youth monitor’ mean that children should be reared primary in the family (below three years: around 80%, three to six years still 30%), and what does it mean that these figures are affirmatively published by key political actors.⁴ Comparative surveys signal that the opinions in the Austrian population are markedly traditional with respect to the gendered division of labour and to child rearing, but less so about working women, to this aspect seems Finland more traditional (see annex figure 4).

³ “Recent research shows that the gender gap in wages is to a large extent a ‘family gap’. In the United Kingdom, for example, the gender wage gap (that cannot be explained by other observable factors) for men and women without children is 10 percent, but increases to >30 percent for those with children and stays at 25 percent for those whose children have grown up (Paul 2006). Similar consequences of motherhood are found for hours worked, with little shrinking of the work gap when children have grown up. Rather than a time when many mothers return to work, school entry of the child is in fact a time of high labor market turnover—with mothers both moving into and out of work and changing their working patterns. Indeed, substantial gender wage and work gaps persist 30 years after birth. Motherhood thus substantially harms the human capital of women, especially for high-skilled women (Anderson et al. 2002).” (Bovenberg 2008 Ceslfo-Version, p.605, footnote 5)

⁴ <http://www.bmfi.gv.at/dam/bmfi/Jugend/Jugendforschung/Jugendmonitor/Jugendmonitor-Mai-2011/Jugendmonitor%20Mai%202011.pdf>

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Some final thoughts about selected questions:

- To which degree might the prevailing segregation be reproduced rather by structural features of the education institutions than by the day-by-day practices within the structures? This might be seen as a 'hen-and-egg' question, however, has been often an issue in research. Given the traditional opinions and the segregated structure of occupations and educational programmes, an important question concerns the timing of the educational choices in the course of career trajectories. How do the gender specific socialization processes relate to the process of educational choice that is clearly timed by the structure of the system: 1st step at age 10 between the 'elite' track and the 'common' track; 2nd step at age 14 between a wide range of vocational programmes at the different levels, depending to some part on the achievement records; 3rd step at age 15 between full-time school and a wide range of apprenticeship programmes; postponement of choice is at this stage related to school failure, except in the 'elite' track; at age 18 or 19 a 4th stage allows for the choice of postsecondary programmes and higher education, depending on a successful completion of Matura at the upper secondary level. Fact is the very persistent gendered choice outcome that is reflected in the segregated structure shown by the indicators. The correlation between participation in vocational education and gender specific differences in science and technology supports systematic structural effects. The specific timing of choice seems not very much treated by research, and should be looked at more deeply (see, e.g. Gottfredson 1981).

- How might the sex and gendered structures among teachers and pupils be related to the achievement differentials? The differences in achievement and interests between young females and males also deserve more attention. The results of PIAAC about adult competences in literacy and numeracy do not support so clearly the gender specific differences. Annex figure A5 shows the age specific profiles of adult competences in these domains. We can see that in numeracy men perform persistently better (women show average scores between 2 and 5 per cent lower than men at the international average), whereas in literacy women in some countries (e.g., Finland) to some degree outperform men. At the international average younger women up to age 30 outperform men very slightly (score less than 1 per cent higher). In Austria the results about youth (e.g., PISA) are supported by PIAAC, as women have earned a better average score among the 15-19-years age group. However, among the older age groups the score of women is very slightly (between 1 and 3 per cent) lower than those of their male counterparts. From these results the seemingly marked difference of achievement profiles appear a rather recent phenomenon, which could be related to the improvements of female youngsters in education.

- To which degree must the sex and gender differences in schooling be attributed to broader patterns in society and the structures of employment and social security? A key question seems to be, which degree of change or progress can be expected from policy measures in education, given the sketched environment and structural effects. In other words, to which degree must the measures at the process level within education be seen as a kind of the proverbial 'fight against windmills'? This issue should be seriously considered, if evaluations are performed of these kinds of internal efforts.

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A more political issue seems the new discourse about the disadvantages of boys and male youth as compared to girls and female youth, and the 'intersectionality' of disadvantage, in particular in relation to migration. We have seen by the inspection of the indicators, that issues of 'intersectionality' (e.g., sex/gender and migration, or social and regional) have not been covered successfully so far.

The mix of advantages and disadvantages of males and females could be clarified by a kind of scoreboard that includes the various dimensions, and should not be tackled as an ideological or even 'sensational' attention catching topic, that would lead us out of the 'boring' discussions of persistent disadvantages of girls and women. A more recent formula for this disadvantage has been coined as the 'Paula-Principle' mirroring the male 'Peters Principle'.⁵ A final citation might underline these issues:

"Across the industrialised world, women and girls are outperforming men and boys educationally, but when it comes to pay or career progression, women do not match men, let alone beat them. This gives rise to what I call the Paula Principle: women are likely to be working below their competence level (the mirror image of the Peter Principle, that everyone rises to his [sic] level of incompetence). The Paula Principle is not just about the glass ceiling; it applies at all organisational levels. [...] So female careers flatten out and many women are lost to leadership positions. There are many factors at play here, interacting with and reinforcing each other. [...] But the key determinant of a woman's career trajectory is not whether she has children, but whether she works part-time." (Schuller 2014)

⁵ <http://www.paulaprinciple.com/about/>

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https://www.bifie.at/system/files/buch/pdf/NBB2012_Band%201_gesamt_0.pdf; the tables and figures are completely documented in a separate Excel-file: https://www.bifie.at/system/files/buch/pdf/NBB2012_Band1_Grafiken.xlsx

Vol.2 Herzog-Punzenberger, Barbara (Hrsg.). (2012). Nationaler Bildungsbericht Österreich 2012, Band 2: Fokussierte Analysen bildungspolitischer Schwerpunktthemen. Graz: Leykam. Chapters: <https://www.bifie.at/buch/1915>; Full:

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ANNEX

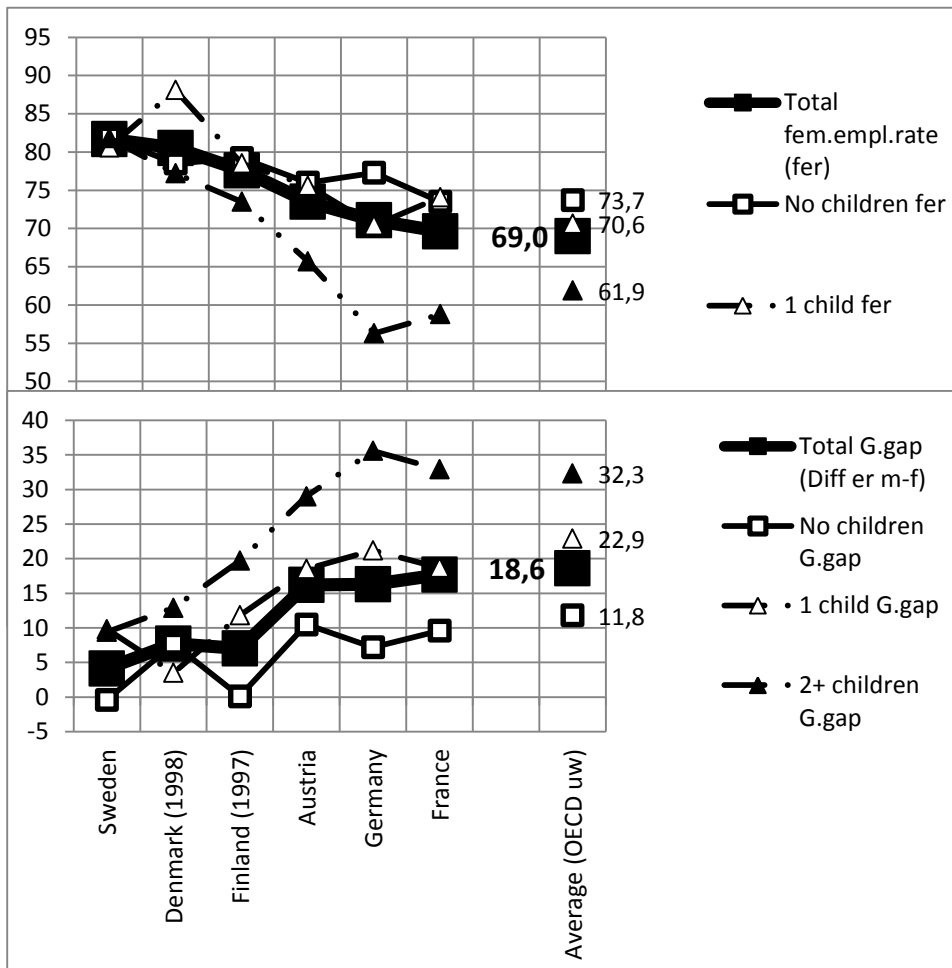
Table A1: Age pyramid and distribution of teaching personnel (2010)

Age	Teaching personnel (1.000s)					
	Male		Female		Total	
	Male National	Male Federal	Female National	Female Federal	National	Federal
below 23	11	13	46	294	57	307
23	16	24	53	355	69	379
24	34	42	88	462	122	504
25	51	74	179	559	230	633
26	99	82	306	660	405	742
27	131	133	363	690	494	823
28	174	155	478	754	652	909
29	209	153	452	837	661	990
30	237	197	479	796	716	993
31	258	208	478	730	736	938
32	250	209	411	673	661	882
33	265	255	432	688	697	943
34	270	234	446	799	716	1033
35	320	259	494	1015	814	1274
36	324	317	500	1149	824	1466
37	358	319	502	1175	860	1494
38	392	347	547	1270	939	1617
39	427	361	581	1198	1008	1559
40	437	395	577	1284	1014	1679
41	479	402	644	1353	1123	1755
42	484	411	759	1436	1243	1847
43	545	440	761	1642	1306	2082
44	499	429	827	1665	1326	2094
45	582	484	792	1915	1374	2399
46	561	515	839	2029	1400	2544
47	605	522	868	2074	1473	2596
48	611	554	1001	2218	1612	2772
49	589	525	976	2328	1565	2853
50	627	565	951	2274	1578	2839
51	653	599	987	2311	1640	2910
52	672	692	952	2437	1624	3129
53	773	751	1031	2535	1804	3286
54	788	829	1032	2630	1820	3459
55	791	890	994	2253	1785	3143
56	806	790	901	2037	1707	2827
57	775	786	777	1822	1552	2608
58	767	777	605	1621	1372	2398
59	642	688	552	1354	1194	2042
60	505	375	331	568	836	943
61	382	180	235	201	617	381
62	268	101	144	105	412	206
63	160	52	60	47	220	99
64	62	29	29	27	91	56
65	23	8	7	2	30	10
über 65	20	11	3	7	23	18
Summe	17932	16182	24470	54279	42402	70461

Source: National Education Report, data table Fig. B4.a

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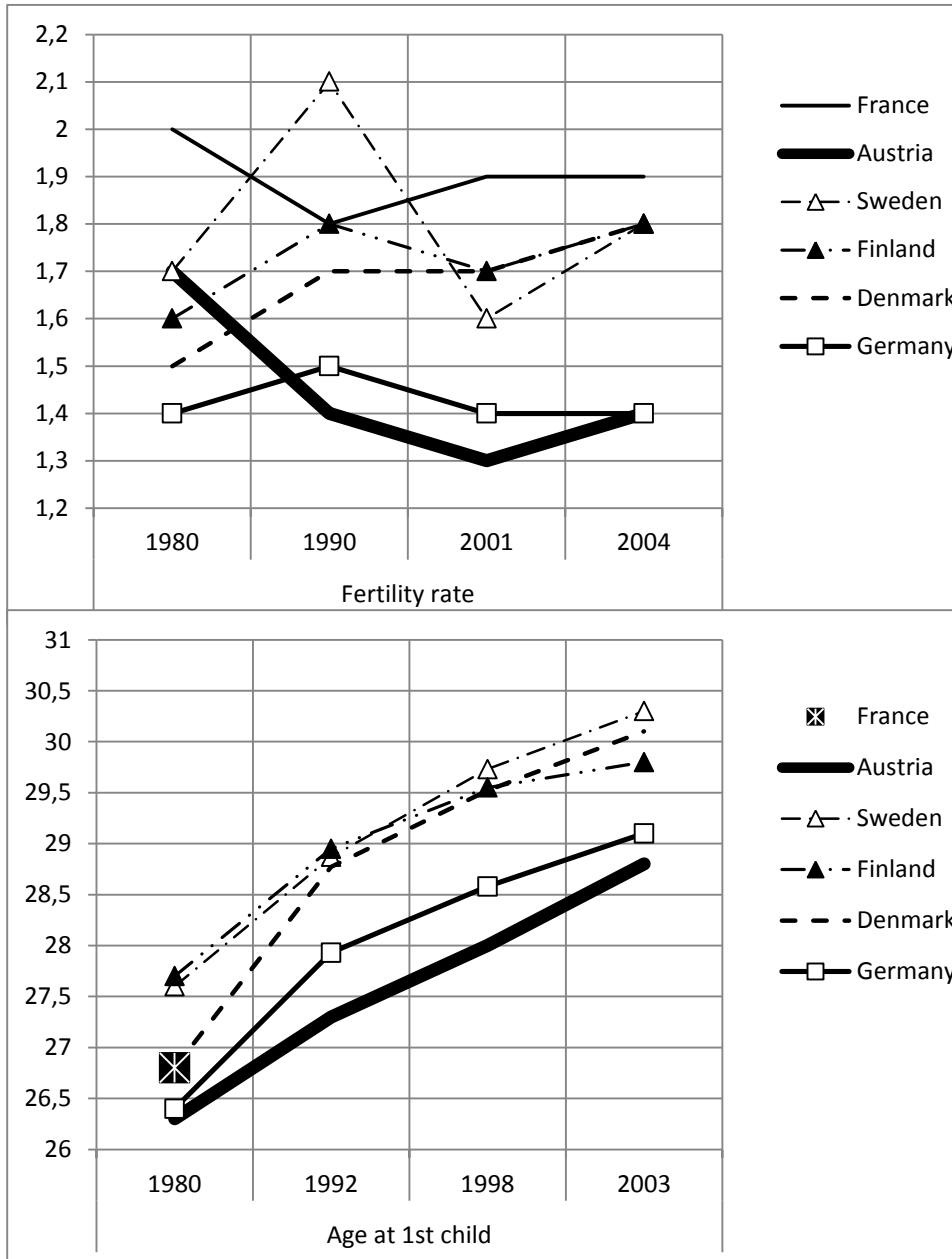
Fig.A1: Female employment rate for persons aged 25-54, gender gap of employment rate, broken down by number of children in selected countries, 2000



Source: Own picture, calculation, based on Bovenberg 2008, p.598, CESifo Economic Studies, Vol. 54, 4/2008, 593–641
doi:10.1093/cesifo/ifn029

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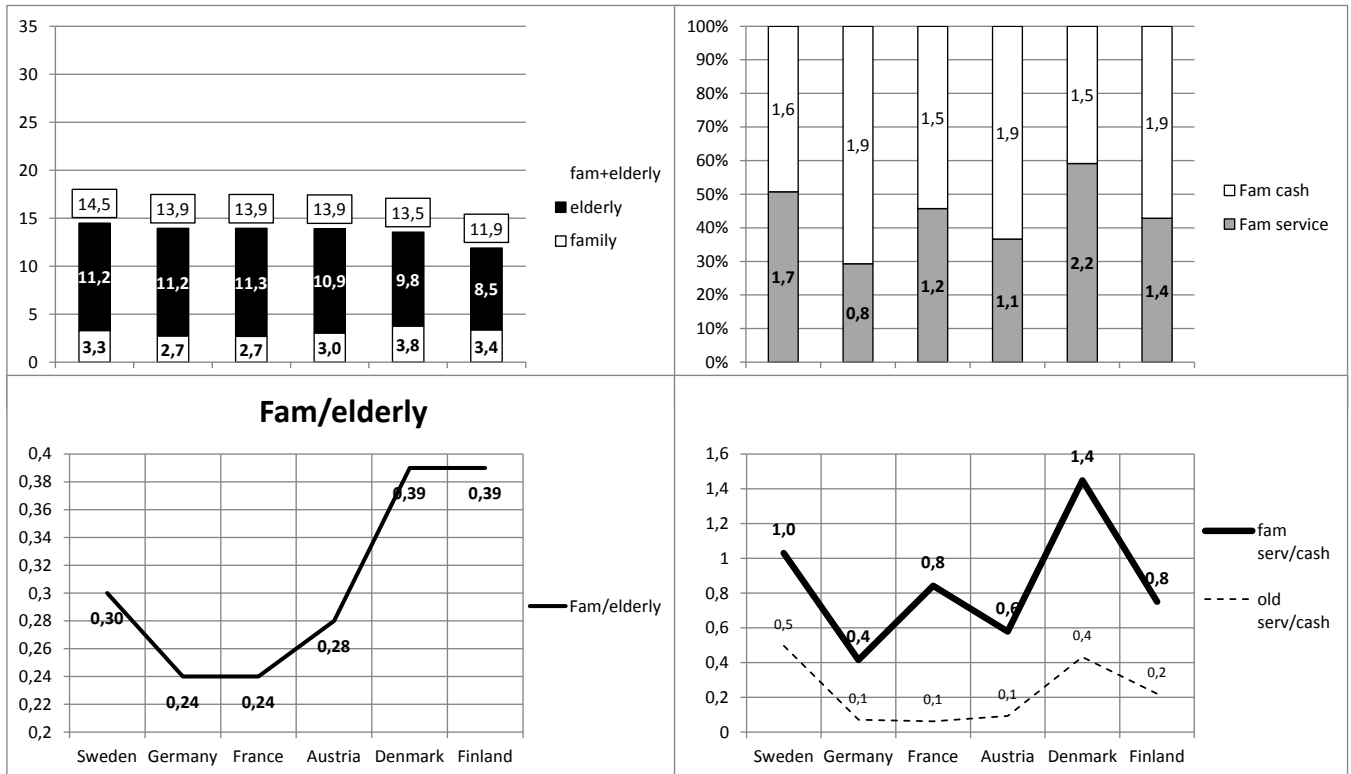
Fig. A2: Development of fertility and age at birth of 1st child, 1980 to 2000s, selected countries



Source: Own picture, calculation, based on Bovenberg 2008, p.604, CESifo Economic Studies, Vol. 54, 4/2008, 593–641
doi:10.1093/cesifo/ifn029

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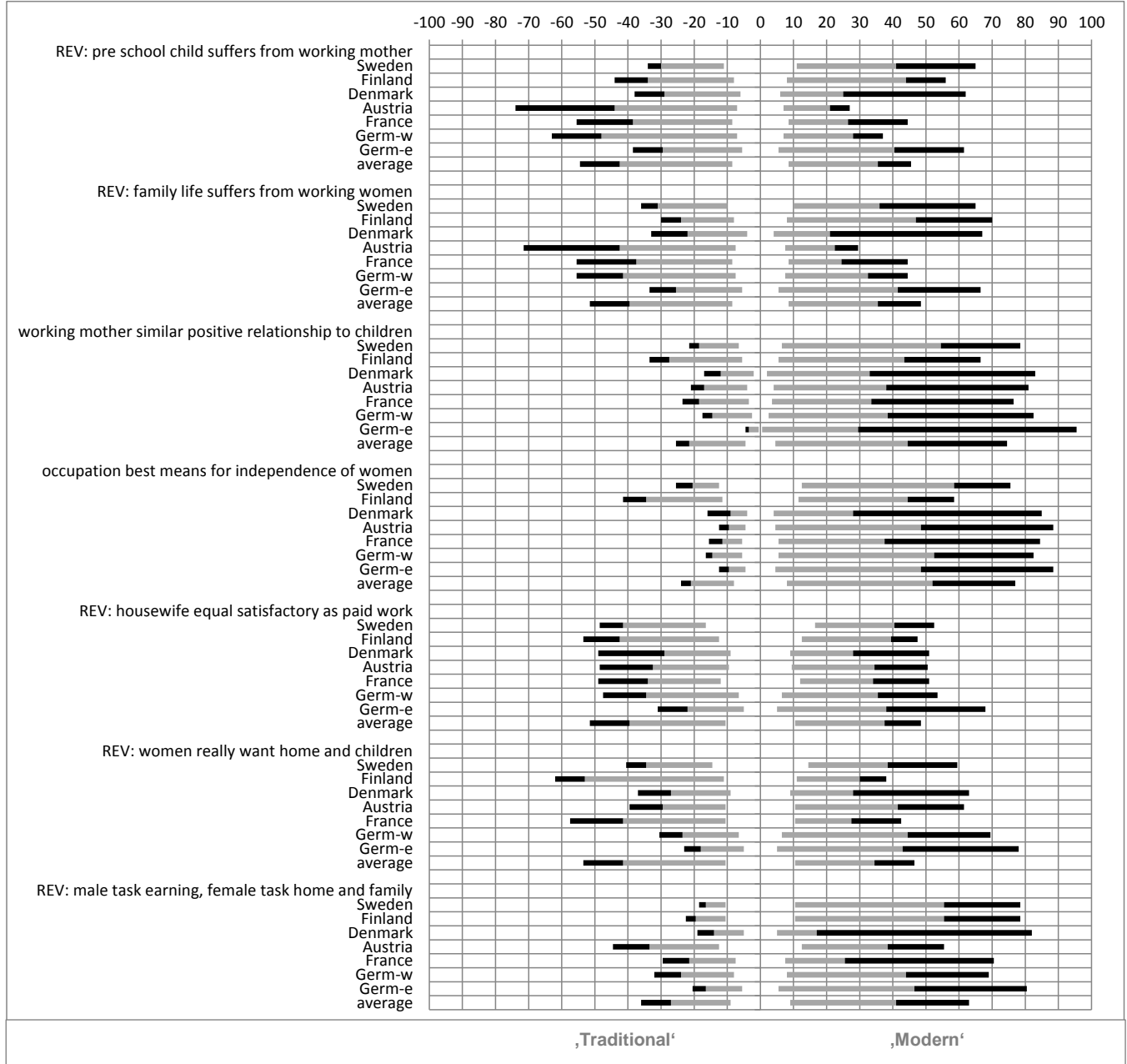
Figure A3: Public spending for benefits for families and elderly persons % of GDP, broken down by cash and service benefits, 1998, selected countries



Source: Own picture, calculation, based on Bovenberg 2008, p.613, CESifo Economic Studies, Vol. 54, 4/2008, 593–641
doi:10.1093/cesifo/ifn029

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Fig. A4: Opinions in population about gender roles concerning household and childcare, 2002, selected countries



Source: Own figure and calculations based on Wernhart & Neuwirth 2002, pp. 24-31, selected figures, own translations from German

Explanation: The scale ranges from strong positive to strong negative, REV items were revised (positive statement is re-scaled to the left =traditional), neutral statements were scaled half negative and half positive; average is for EU-countries

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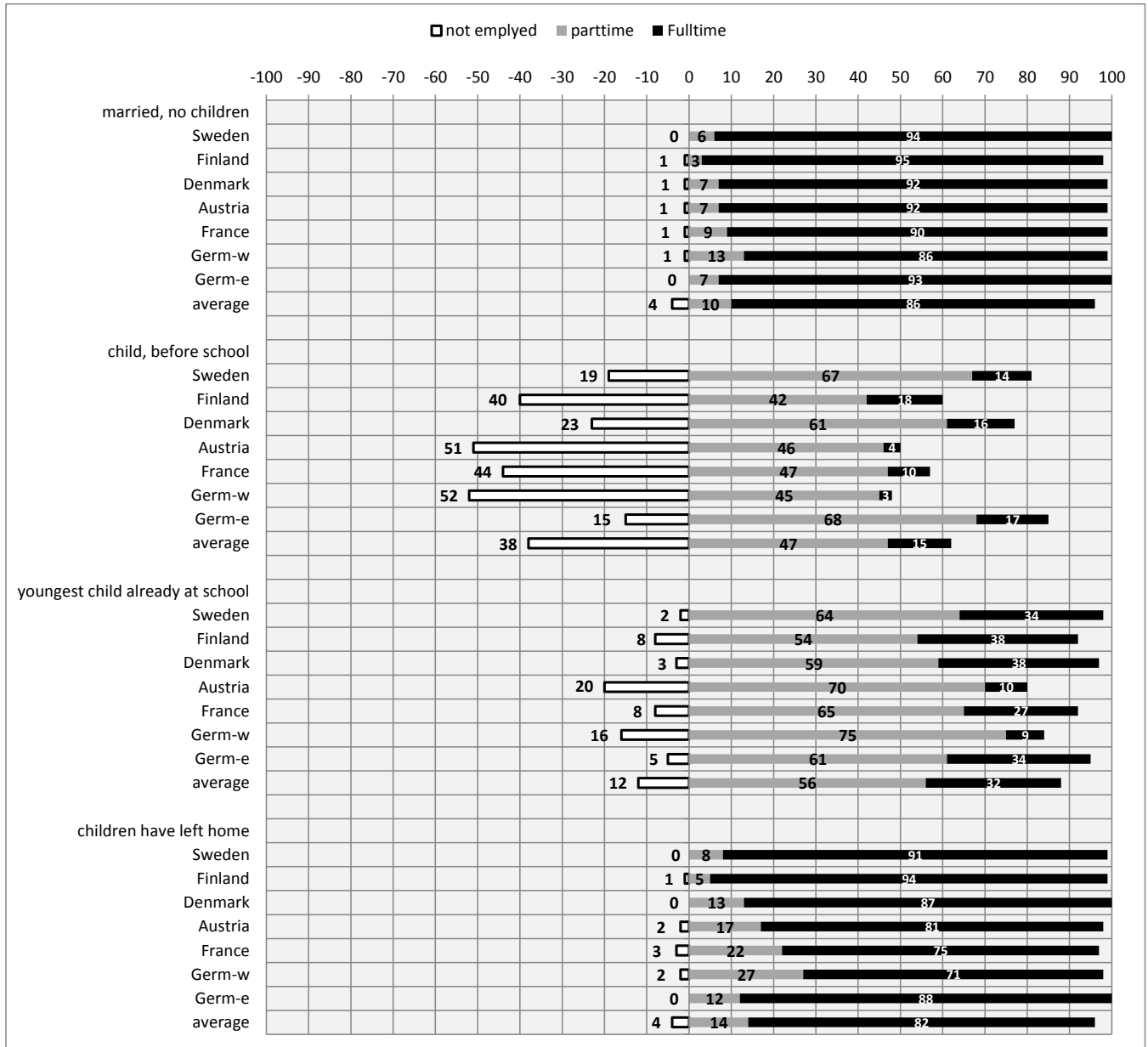
Tab. A2: Opinions in population about gender roles concerning household and childcare, 2002, selected countries

	++	+	~	-	--
pre school child suffers from working mother (fig 4-8)					
Sweden	4	19	22	30	24
Finland	10	26	16	36	12
Denmark	9	23	12	19	37
Austria	30	37	14	14	6
France	17	30	17	18	18
Germ-w	15	41	14	21	9
Germ-e	9	24	11	35	21
average	12	34	17	27	10
family life suffers from working women (fig. 4-7)					
Sweden	5	21	20	26	29
Finland	6	16	16	39	23
Denmark	11	18	8	17	46
Austria	29	35	15	15	7
France	18	29	17	16	20
Germ-w	14	34	15	25	12
Germ-e	8	20	11	36	25
average	12	31	17	27	13
working mother similar positive relationship to children (fig. 4-6)					
Sweden	24	48	13	12	3
Finland	23	38	11	22	6
Denmark	50	31	4	10	5
Austria	43	34	8	13	4
France	43	30	7	15	5
Germ-w	44	36	5	12	3
Germ-e	66	29	1	3	1
average	30	40	9	17	4
occupation best mean for independence of women (fig. 4-5)					
Sweden	17	46	25	8	5
Finland	14	33	23	23	7
Denmark	57	24	8	5	7
Austria	40	44	9	5	3
France	47	32	11	6	4
Germ-w	30	47	11	9	2
Germ-e	40	44	9	5	3
average	25	44	16	13	3
housewife equal satisfactory as paid work (fig. 4-3)					
Sweden	7	25	33	24	12
Finland	11	30	25	27	8
Denmark	20	20	18	19	23
Austria	16	23	19	25	16
France	15	22	24	22	17
Germ-w	13	28	13	29	18
Germ-e	9	17	10	33	30
average	12	29	21	27	11
women really want home and children (fig. 4-2)					
Sweden	6	20	29	24	21
Finland	9	42	22	19	8
Denmark	10	18	18	19	35
Austria	10	19	21	31	20
France	16	31	21	17	15
Germ-w	7	17	13	38	25
Germ-e	5	13	10	38	35
average	12	31	21	24	12
male task earning, female task home and family (fig. 4-1)					
Sweden	2	6	21	45	23
Finland	3	9	21	45	23
Denmark	5	9	10	12	65
Austria	11	21	25	26	17
France	8	14	15	18	45
Germ-w	8	16	16	36	25
Germ-e	4	11	11	41	34
average	9	18	18	32	22

Source: Own figure and calculations based on Wernhart & Neuwirth 2002, pp. 24-31, selected figures, own translations from German

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Fig. A5: Opinions in population about work of mothers



Source: Own figure and calculations based on Wernhart & Neuwirth 2002, pp. 32-35, figures 4-9 bis 4-12, own translations from German

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Fig. A5a: PIAAC Literacy mean score by gender and age (upper panel), index female/male score (lower panel)

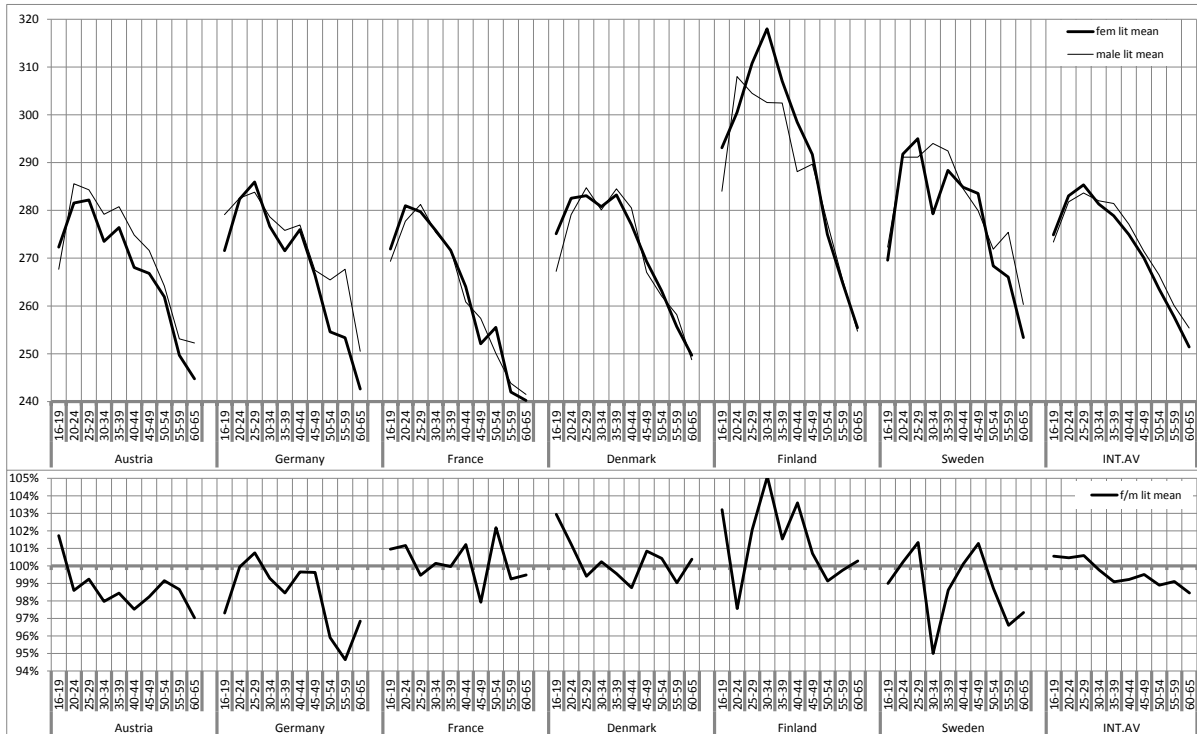
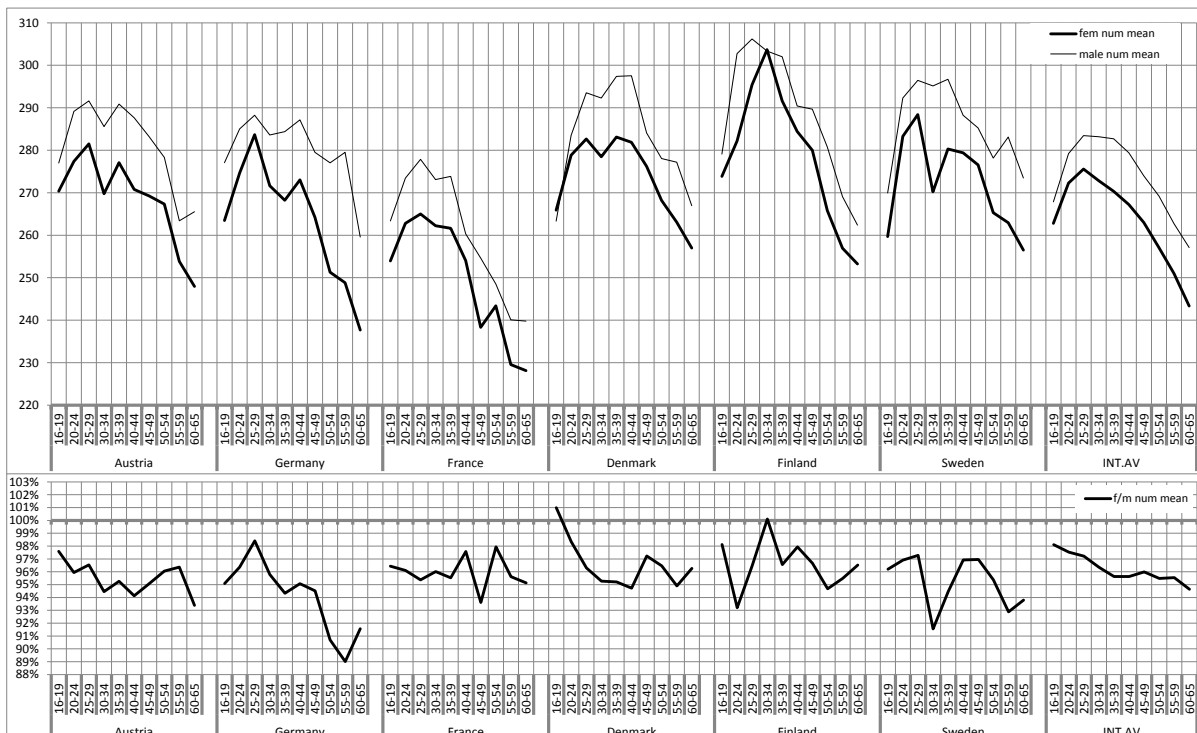


Fig. A6b: PIAAC Numeracy mean score by gender and age (upper panel), index female/male score (lower panel)



Source: own calculation from PIAAC data