



**Claudia Quaiser-Pohl,  
Martina Endepohls-Ulpe (Eds.)**

# Women's Choices in Europe

**Influence of Gender on Education,  
Occupational Career  
and Family Development**

**WAXMANN**



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## **Education, occupational career and family work – similarities and differences in women’s choices in Europe (Editorial)**

The options women have to shape their lives – at least technically – have dramatically increased in the last decades, and this is true for all European countries. Changes in European societies with respect to women’s rights have been fundamental, amongst other things as a result of the women’s movement which, from the point of view of some social scientists, caused one of the greatest social revolutions of the 20<sup>th</sup> century (Lenz, 2008). At the beginning of the new millennium, girls and women all over Europe have access to all stages of the educational system. They can choose an interesting field of study at a university (at the beginning of the 20<sup>th</sup> century they were not even allowed to attend a lecture), take up an occupation without the permission of their husbands or fathers, they can decide if and when they want to have children, due to the development and availability of effective methods of contraception, and they have the chance to play a part in all areas of society and politics.

However, all these changes happened in countries which differed and still differ in geography, history, culture and in their political situation. The second wave of feminism, which emerged in Europe after World War II, encountered very different political systems and histories of democratic development. In nations which had been afflicted with fascist regimes and ideologies like Germany, Italy or Spain it seemed to be more difficult to build up the feminist networks again, than in countries with a more continuous history of democracy e.g. in the United Kingdom or some Scandinavian states (see EURYDICE/EACEA, 2010; de Sotelo, 2005), and within the Eastern communist bloc the rights of women concerning access to education and paid employment were a principle of the system. On the other hand, political activism was not possible there, as the chances of political activities were limited. After the collapse of the communist regimes in 1989, a feminist discussion emerged in these countries on a quite different base as it could start from in other parts of Europe.

Considering these different starting points of the women’s movement and the historical, cultural and political differences between the countries, it is no surprise that the situation of women in different European countries is not similar and that the process of reaching equal status with men has come

to different stages in different areas of life. Besides, there are still fields of remarkable gender inequalities, which can be stated all over Europe concerning e.g. employment rates, average wages, rates of participation in economic and political decision-making positions, the division of family responsibilities, and so on (see EURYDICE/EACEA, 2010, p.19).

This book wants to give some insight into the differences as well as the similarities of women's lives, their educational and occupational attainment and their choices with respect to occupational career and family life in several European countries. It is divided into four sections, each dealing with an issue that is crucial and has been extensively discussed in studies on gender inequalities all over Europe: the gender difference in educational outcomes and the role of gender in the educational system, the (lack of) participation of women in STEM (Science, Technology, Engineering and Mathematics), women's occupational choices and careers and the gender gap in leadership positions, men's and women's roles in families and their roles in different stages of family development. These topics are well known, the individual contributions/chapters, however, consider aspects and add points that have been neglected in the discussion so far.

Section I starts with a chapter on gender differences in educational outcomes. Martina Endepohls-Ulpe discusses a phenomenon, observed in all European countries, that, after some decades of equal access of women and girls to the educational system, the educational success of boys and of male adolescents seems to fall behind the results of girls. The author points out that this discussion neglects the fact that the advantages of females seem to be restricted to certain domains, and, in the discussion of possible causes, demonstrates that the so-called "boy problem" is obviously older than people think it is.

One of the different causes which have been found for gender differences in educational outcomes – gender-typed classroom interactions – is discussed by Christine Fontanini and Céline Avenel in the next chapter. With the results of their study in French university courses, the authors demonstrate that the gender-typed interactions that have been observed between elementary and secondary school students and their teachers do occur in adult education, too.

The chapter by Ewa Malinowska shows how gender-role attitudes and gender behavior can be changed through university courses on gender topics. She refers to Alain Touraine's theoretical concept of the social subject and reports about an interview study she has conducted with 48 mostly female university students of social work who had attended an optional course on "Feminism: then and now" before. The effects of the knowledge gained in the course ranged between changes of awareness and attitude to one's self



on the one hand and behavioural changes in relationships with other people on the other hand, and they point to the importance of gender education in adult learning.

Science, technology, engineering, and mathematics (STEM) are regarded as very important for national economies all over the world and also in the European countries. Therefore expanding and developing the STEM workforce is regarded as a critical issue for governments, managers, and educators. However, despite the tremendous gains that girls and women have made in education and the workforce during the past decades, girls don't participate in STEM fields, and certain scientific and engineering disciplines remain overwhelmingly male. The chapters of Section II of the book analyse the situation in Europe, and by mainly focusing on STEM education and training at schools try to discover why there are still very few women in certain scientific and technical fields. As an introduction Claudia Quaiser-Pohl presents statistical data on the situation of women in STEM in Germany in comparison with other European countries, unsurprisingly showing many similarities. She further identifies and discusses psychological (motivation, self-concept, achievement) and socio-cultural (gender stereotypes, image of STEM occupations) factors encouraging or preventing women's choices for STEM.

Jacqueline de Weerd and Els Rommes in chapter 2 of this section discuss the results of an empirical study, which they have conducted in Dutch schools. It consists of in-depth interviews and a survey on the reasons why pupils continue science subjects in school or not. In line with studies from other countries the results show that in the Netherlands besides the fact, that physics is less attractive for girls than chemistry and therefore has higher gender connotations, the teachers' behaviour influencing girls' self-confidence is very important for the different subject choices of boys and girls.

In the third chapter of this section Martina Endepohls-Ulpe, Judith Ebach, Joseph Seiter and Nora Kaul present results from the European research project UPDATE, aiming at improving science and technology education in Europe. It deals with motivational factors and barriers for girls/boys and women/men to choose a university subject in a technical domain. They show similarities and differences between German and Austrian male and female engineering and non-engineering university students with regard to their retrospectively remembered self-efficacy and interests in science and technology in childhood, and the image an engineer's occupation has for them. In general they point to the importance of early processes of socialization and to the role of compulsory courses in technical education already in primary school.

How to improve girls' motivation to study technology at grade 5-6, within the technology education based on the National Framework Curriculum 2004 in Finland, is the topic of Sonja Virtanen. Her research shows that the gender gap in STEM exists in Finland, as well and that, when courses can be voluntarily chosen in grades 5 to 7, girls prefer textile crafts lessons to technical crafts lessons. Her survey with 300 Finish pupils aged 11-12 revealed that in order to offer a gender-sensitive technology education the contents of technology trainings should be referred to. Girls could be encouraged by providing them with more opportunities for creating aesthetic products and by introducing environmental aspects, instead of male-stereotyped contents like building electronic devices to them.

Although girls' education has immensely improved during the last decades in general, women still have fewer opportunities for "good jobs" with high salaries and that is true for all areas of the job market. They are e.g. extremely underrepresented in leadership positions in business and in politics. Section III focusses on women's occupational careers in France, Austria, Germany and Bulgaria, starting with their choice of occupation and continuing with their motivation for leadership positions and gender differences in leadership styles.

Christine Fontanini in chapter 1 analyses the role of girls' leisure time activities for occupational choices and focusses on the relationship between horse riding and the desire to become a veterinarian. The results of her questionnaire study with 192 male and female riders from French riding-clubs show a strong correlation between personal interest and activity domains in childhood and youth and the professional choice some years later. Thus early socialization as well as the role of the media (e.g. magazines) seems to have a strong impact on professional aspirations and occupational choices.

In chapter 2 of this section Elisabeth Sander reports the results of an interview study on the biographies of 15 female Austrian scientists. The interviewees belong to different birth cohorts, different scientific domains (physics, chemistry, engineering) all working at the university but at different stages of the academic career (graduates, post docs, university professors). They have many things in common with regard to the career choice and to their personal experiences in the job. The similarities between the women are related to early socialization and childhood experiences as well as to the family background and the feeling of having been accepted or rejected during study enrolment, but also with regard to their attitudes towards special support programmes for women in a "typical" male domain.

The chapter by Gwen Elprana, Sybille Stiehl, Magdalene Gatzka and Jörg Felfe deals with gender differences in the motivation to be the leader as a precondition for having a leadership position. In the course of their Ger-

man-wide interview study with 50 high level experts (managers, directors, consultants from both the private and the public sector) they identified predictors for a high motivation to lead (MTL) in women and men. In contrast to the male interviewees most of the females felt disadvantaged in the role of a female manager, they did not persist in having a leadership position as much as males did and they attributed their success rather to beneficial contextual factors than to personal characteristics. The results point to motivational barriers and concerns about leadership in German female leaders, like the work-life-conflict and the emotional pressure going along with management positions, which have to be overcome to reach the top.

In contrast to that, Elmira Bancheva and Maria Ivanova draw a picture of female Bulgarian leaders who are not afraid to deal with the demands of complex environments with many conflicts. They discovered many differences between the results of international leadership research and female leadership in Bulgaria, one of the former socialist countries facing the drastic challenges of political and economic transformations during the last decades. For their empirical research on gender differences in leadership behaviour they gathered data by employing quantitative questionnaires on gender differences in leadership styles. Results show females having a higher score on transactional style and laissez-faire style and men exceeding in management by exception and contingent reward. The authors conclude that their results should lead to a better public understanding of what female leaders already do, in which way this could be improved and how this can be achieved.

Section IV focusses on family life, on socio-cultural changes of the related gender roles and their changes in different European countries (Spain, Ireland, Germany). It further reveals consequences for family development at the transition to parenthood and in late divorces as well as for women's development in particular. On the other hand, it deals with the difficulties of implementing men's and women's new roles in family life.

In the first chapter of this section Anna-Catherina Grohmann, Claudia Quaiser-Pohl and Markus Hasselhorn analyse the relationship between socio-cultural changes and parental well-being in Spanish and German mothers at the transition to parenthood. In contrast to their expectations Spanish mothers were more family-oriented than mothers from Germany, but they also showed more approval for individualistic attitudes, while the parental well-being was similar in both groups. However, personal values correlated with parental well-being only in the German sample. Results reflect changes in family values in Germany and Spain during the last years that had an impact also on gender roles.

Attitudes of women at the transition to parenthood in the Republic of Ireland on the background of Gloger-Tippelt's phase model of the transition to parenthood are the focus of the chapter by Silke Diestelkamp and Claudia Quaiser-Pohl. Besides being an evidence of cultural universality of Gloger-Tippelt's theoretical model, Irish mothers during the postnatal phase showed the supposed development with regard to personal readjustment and stability of the self-image as well as to physical and psychological well-being. In addition, from the perspective of social identity the reduced interest in social relationships with out-groups, like friends or colleagues, reflects a shift of focus to the nuclear family in the phase of challenge and readjustment. These results are in line with findings of changes of the parental roles after the birth of a child and are connected to the observed traditionalization of the role behavior.

The idea of equal parenting and how to implement it in the family lives in Poland is the issue of the chapter by Krystyna Dzwonkowska-Godula and Joanna Brzezinska. From a sociological perspective they analyse the gender-role behaviour of 20 Polish couples via in-depth interviews. Results support a general tendency to an egalitarian role division observed nowadays especially in well-educated dual-career couples. They also show that women in such partnerships tend to expect more paternal involvement, but that they also have difficulties to delegate primary responsibilities to their husbands. Being an active parent assisting in childcare and building up a strong emotional relationship with their children seems to be part of the differentiated pattern of fatherhood in well-educated Polish fathers. This observation reveals similar changes of masculinity and femininity all over Europe.

The consequences of "late divorces" for the lives of German women have been studied by Insa Fooker. The 65 female participants of her study, which is methodologically based on standardized questionnaires and in-depth-oriented biographical interviews, stem from three different birth cohorts (1930, 1940 and 1950). Results show that their experiences of the divorce and their way of coping with it depend on the historical circumstances of their early childhood years and have strongly influenced their whole life. Especially the women of the cohort of the "war children" showed mental health problems in one or another way, they experienced more stress within their families and in their marriages they experienced disenchantment and alienation and felt more dependent on the partners for financial reasons. So, the historical factors influencing women's choices are observed from a very interesting, but seldom taken developmental psychological perspective, here.

As we see, this book shows several differences to other publications on the topic of gender roles and gender behaviour and their sociocultural and historical changes. First, most of the authors are female and they come from

different European countries, which helps to draw a fine-grained picture of the situation of women on the basis of a wide range of different experiences of females' lives. Second, the authors represent different disciplines like psychology (developmental, social and organizational), sociology and educational sciences, which also enlarges the perspective on the topic. Third, the empirical data reported in the book stems from qualitative and quantitative research and therefore represents a large variety of different scientific approaches with regard to content and to method.

We want to thank all the authors for their interesting and extremely individual contributions to our book, especially Vera Heuser for her very helpful editorial support, and of course all the girls and boys, women and men from all the different European countries, who as participants of the various empirical studies presented in this book have supported the scientific knowledge about this topic. We hope that our cross-national European reflections on girls' and women's options and choices in the educational system, within family relations and on the labour market will help to widen the theoretical and empirical horizon for this issue and lead to a better understanding of the phenomena.

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*Martina Endepohls-Ulpe*

## **Are females or males disadvantaged in contemporary educational systems?**

### **1. Introduction**

In the last decade there has been a big discussion in Germany and also in other European countries about the issue that the results of boys and of male adolescents in the educational system seem to fall behind the results of girls. This is an astonishing fact insofar, as since the 1970s gender differences in the educational and vocational systems had mainly been highlighted from a perspective of the discrimination of women and girls and in the last forty years numerous efforts have been made to provide equal access to qualified graduations and apprenticeships to girls.

However, since a few years, amongst others as a consequence of the results of international assessment studies like PISA or PIRLS, boys are more and more getting into the focus of attention. Especially the media point out in a very oversimplifying way to the fact that boys' achievement at schools falls behind the achievement of girls. Boys are identified as the "new losers" in the educational system and their situation is labeled as "crisis". The causes of this situation are frequently claimed to lie in changes in schools or instructional processes driven by a feminist pedagogical agenda exclusively concentrated on the needs of girls.

Interestingly this discussion has already been held in the United Kingdom, Australia, New Zealand and Canada since the late 1980s and led to numerous publications in popular science in these countries, where boys were presented as the new victims of an educational system, which mainly meets the needs of the girls (for an extensive discussion see Lingard, 2003; Mills, 2003; Titus, 2004; Smith, 2003; Weaver-Hightower, 2003). As a response many national reports and scientific studies were initiated (Gilbert, 2009) and also many measures in the educational systems which social scientists from these countries partly judged to be not very well grounded (Mills, Martino & Lingard, 2007). Weaver-Hightower (2003) talks about a "boy turn" in educational sciences, and there are authors who even label the discussion as "moral panics", as they do see the problem, but judge it not as dramatic as it is presented in the media and see the causes much more differentiated (Mills et al., 2007; Smith, 2003).

Nevertheless, there are recent attempts also in Belgium, Ireland, Portugal, Sweden and Austria to improve boys' attainment at school or decrease drop-out rates (EURYDICE/EACEA, 2010).

This chapter will present a short overview of statistical data relating to gender differences in school achievement, quality of school graduations of males and females, and gender related results of international studies on student assessment like PISA or PIRLS for Germany and other European countries. Afterwards an overview and critical appraisal of the most frequently reflected explanations for the resulting pattern will be given and finally some possibilities for intervention will be suggested.

## **2. Gender differences in educational outcomes**

### **2.1 Educational careers, certificates and grades**

Figure 1 shows the current ratio of male and female students on different types of German secondary schools with different levels of graduation. The higher the level of graduation that can be attained, the greater is the percentage of girls on the specific type of school.

In the United Kingdom, where there has been an increased public interest in comparing the effectiveness of different schools, girls also get better results than boys at the end of grade 10 (Benchmark: 5 A\*- C Grades), a phenomenon which has already been observed and discussed in the 1980s. Levels of graduation for both sexes have dramatically improved since the 1970s (Connolly, 2004), but for boys this effect was not as high as it was for girls.

Similar observations have been documented for several other European countries (see EURYDICE/ EACEA, 2010).

In Germany, there are also more boys than girls leaving school without graduation. The percentage of males in this group has consistently stayed on a level of approximately 64% since the 1990s (Budde, 2008). However, most of these boys seem to make up for their school leaving certificates later. At the age of 22 only 2,7% males and 2,1% females are without a school leaving certificate.

So as a matter of fact boys' school graduations and results are not as good as girls' and this is the case in many European and non-European countries. However, with respect to choices of courses of study or occupation and on occupational careers this situation seems not to have any detrimental effects for males.



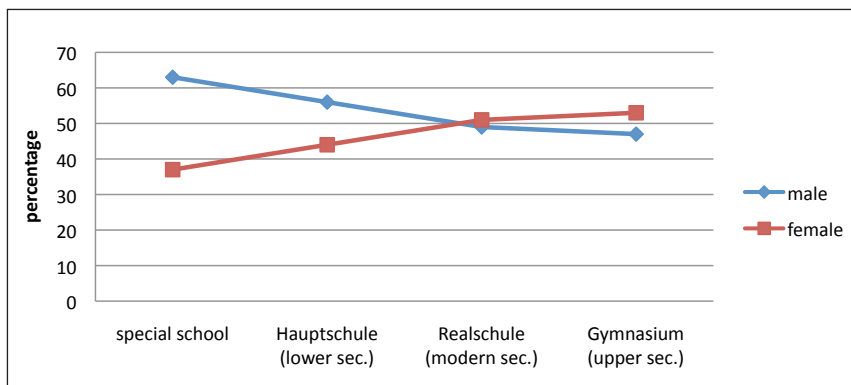


Figure 1: Ratio of male and female students on different types of German secondary schools (BMBF, 2007/2008a, b)

In Germany, in spite of a smaller number of males acquiring the general qualification for university entrance at the moment, the ratio of males and females taking up studies at the university is equal. Gender ratio between university graduates is also nearly equal. But on their way to higher occupational positions or to higher academic graduations males clearly outperform females (Statistisches Bundesamt [Federal Statistical Office], 2007a,b). They also choose more frequently courses of study from the field of STEM (science, technology, engineering and mathematics) which provide better incomes and career options. In the meantime there is a slight overweight of women in tertiary education in many European countries, but after finishing their courses of study most of the young women finish their academic career and there is finally a strong underrepresentation in higher academic grades.

The overall situation of men and women in European occupational systems is characterized in a recent EU-report (EURYDICE/EACEA, 2010, p.19) by a lower employment rate and lower average wage rate for women and a strong under-representation of women in economic and political decision-making positions and a higher risk of poverty.

## 2.2 Gender differences in results of international assessment studies

### 2.2.1 Reading achievement

An issue of concern that is discussed in the context of gender differences regarding male underachievement is the gender gap in reading achievement revealed by all international assessment studies conducted in the last decade.

In PIRLS 2006 (Progress in International Reading Literacy Study) girls in the fourth grade in average showed better reading achievement in nearly all of the participating countries. But mean differences between reading competences of girls and boys vary. In Spain and Luxembourg, there are no differences; In Germany e. g. they are very small, whereas they are great in the United Kingdom (Blossfeld et. al, 2009). This picture gets more concise when we take a look at the reading achievements of older students. In PISA 2009 the mean difference in reading achievement between girls and boys was 39 points in favor of the girls (Germany: 40; smallest difference in Chile: 22 ; greatest difference in Finland: 55) (Naumann, Artelt, Schneider & Stanat, 2010). Similar differences have been detected in all former PISA surveys. In Germany, the number of extremely poor readers – below competence-level Ia – is three times as high for the boys as for the girls and the number of poor readers is nearly two times as high as for the girls.

In spite of their poorer reading abilities boys' self-concept with respect to this domain is as high as the one of the girls. There seem to be differences in interest and engagement in reading activities that are crucial for their lower achievement (Naumann et al., 2010).

### **2.2.2 Mathematics**

Gender differences in mathematics are not as pronounced and not as stable as in reading. But when differences are discovered they mostly appear in favor of the boys.

Girls and boys enter school with equal preconditions for learning mathematics (Tiedemann & Faber, 1994; c.f. Budde, 2008; Rohe & Quaiser-Pohl, 2010). In Germany, an articulate gender gap seems to develop in favor of the boys already in elementary school, and this gap – regularly found in all student assessment studies – is greater than in other European countries. Here often smaller or even no gender differences are found (Bos et al., 2008).

Results for older students from PISA and TIMSS show better results for males, but not in all countries. PISA 2006 detected better competencies in mathematics for boys in approximately half of the European countries and controlling for the stream or tracks attended, females tended not to perform as well as boys in nearly all European countries (EURYDICE/ EACEA, 2010). These results seem to be strongly related to girls' lower self-concepts of their mathematical abilities.

### **2.2.3 Science**

Gender differences in science are small and even less stable than in mathematics. Results from different assessment studies like TIMSS or PISA are not consistent. Whereas TIMSS results frequently report differences in favor of the boys, PISA reports do not find so many differences (EURYDICE/EACEA, 2010). But in spite of equal or nearly equal achievement, self-concepts and self-efficacy of girls in science seem to be lower than that of the boys in nearly all European countries (ibid.).

## **3. Gender differences in educational outcomes – is there a boy problem?**

Since the 1990s girls indeed outperform boys with respect to levels of graduation and quality of school leaving certificates. International assessment studies regularly show advantages in reading achievement – though varying in extent – for girls in nearly all participating countries. Nevertheless, the situation of male adults in the European occupational system seems not to be affected by lower graduations or lack of reading abilities.

There are some aspects that have to be taken into consideration when the causes and possible consequences of this situation are being discussed:

1. Boys as well as girls have clearly improved their average level of school graduation continuously since the 1960s which is true for all of the European countries. But girls profited from the educational expansion of the 70s and 80s to a greater extent as a consequence of the political efforts to provide them with equal opportunities in the educational system. The problem of the male “underachievement” at school does not seem to be a new one but it has just been covered by keeping the girls back from higher levels of education. It has frequently been documented that girls did better than boys whenever they had the opportunity to participate equally in educational measures (Connolly, 2004). This has been e.g. already documented in the British school system in the 1950s and 60s when girls achieved better than boys in the 11+ selection system and – as a consequence – had to do better than boys to be allocated to grammar schools, because one wanted to have equal numbers of boys and girls in upper secondary schools (Epstein, Elwood, Hey & Maw, 1998).

2. Girls’ achievement in mathematics as well as their self-concepts of their own abilities in mathematics and science are still lower than the one of

the boys in a lot of countries, even though the results of the assessment studies are less pronounced and not as stable as in reading achievement.

3. Socio-economic status and ethnic origin affect achievement considerably more than gender. In Germany, parents' socio-economic status explained 16% of the variance of an index for being disadvantaged in the educational system in the PISA study of 2003 (German PISA-Consortium 2004, c.f. Budde, 2008) and thus was the most influencing factor on this index. Socio-economic status and immigration can even interact with gender. For example in the United Kingdom the gender gap is wider for students with lower socio-economic background and for ethnic minorities such as Black Caribbean or Black African, whereas Asian students are often an exception amongst ethnic minorities.

Hence the so called male "underachievement" in the educational system does not seem to be new and also not to be a consequence of a new school policy which favors the girls. Besides, there are still domains where girls do not perform as well as boys. And finally one has to keep in mind that gender differences always have to be considered in the context of socio-economic and ethnic background. Influences of socio-economic and ethnic background even seem to get more important as students grow older (Sammons, 1995, c.f. EACEA/EURYDUCE, 2010).

## **4. Explanatory models and processes**

There are several possible causes for the situation of boys in the educational system, which are frequently discussed in literature:

### **4.1 Biological differences**

Until the discussion about the new "boy problem" came up, arguments from the field of biology had mainly been used to substantiate the innate general intellectual inferiority of girls and women in general and in the field of mathematics and science in particular. Interestingly, biological causes are recently considered to be responsible for the inferior results of males in the educational system, too. It is not argued that boys are lacking the required innate abilities, but that they are "different" and that the educational system is not considerate of this "otherness". E.g. boys are said to have different learning styles (more visual than auditory) and different needs with respect

to physical activity which the schools do not take into account (Birkenbihl, 2005; for a discussion see Gilbert, 2009).

After decades of discussion about the extent of an impact of biological differences on gender differences in achievement as well as about the fields of a possible impact, the role of biology in this field is still not clear. The state of knowledge on these questions is continuously changing. On the other hand it is beyond controversy that right after birth environmental influences can enlarge and modify innate gender differences – which only exist as moderate mean differences with respect to the total population of males and females anyway.

Especially primary school teaching methods and pedagogical models have changed in the last decades – away from a teacher-centered and language-oriented way of instruction where students have to sit still and are not allowed moving. Actually this change should favor the supposed visual learning style of the boys and their biologically grounded thrive for physical activity instead of being detrimental to their achievement at school.

## **4.2 The “feminization” of the teaching profession**

In all European countries, except Turkey, the majority of primary school teachers are women (EACEA, Eurydice, 2010). It is argued that boys’ lack of male role models leads them to define school as something feminine and to oppose against the requests of instruction (Rohrmann, 2007). This opposition results in destructive social behavior which hinders learning. Especially in anglophone publications from the field of popular science some authors even postulate a conscious discrimination of boys by feminist female teachers. This fact combined with the fact that the majority of teachers are female is said to be responsible for boys’ lack of achievement (see Weaver-Hightower, 2003).

Actually up to now there is not much empirical evidence for the notion that boys who are taught by male teachers do better at school. Blossfeld et al (2009) point out to the fact that the results of the PIRLS-study do not reveal that in countries with a greater number of male teachers in primary schools boys’ reading achievement is better. But reading instruction by a female teacher seems to be better for boys’ self-concept of their reading abilities (Sokal, Katz, Chaszewski & Wojcik, 2007). In a study with nearly 9000 11 year-old British children Carrington, Thymms und Merrel (2008) did not find that achievement of boys who were taught by male teachers was better nor vice versa achievement of girls taught by female teachers. However,

children's attitude towards school – both of girls and boys – was more positive when they had female teachers.

Besides, the gender gap in achievement is greater at secondary school level, where the ratio of male and female teachers is more balanced (Budde, 2008; EACEA/Eurydice, 2010).

### **4.3 Gender stereotypes and their impact on the process of identity formation of children**

At present there is an agreement in the field of psychological theory building and empirical research that children's acquisition of gender typed abilities or social behavior is to a large extent a result of their own activity. Cultivating a gender-related identity is a major task for children which they need to master during the course of their development. Hence children and adolescents tend to engage in activities which fit to their self-concept as a male or female. This has the consequence that boys avoid activities which are stereotyped as female e.g. reading, working diligently, cooperating with teachers, etc. (Hannover, 2004). This approach also can explain the inferior achievements as well as the self-concepts of girls in the field of mathematics and science as these subjects are connected to the male stereotype.

### **4.4 Being masculine at school – group processes and gender roles**

Gender differences in children's behavior appear to be more pronounced when they act in groups. From the beginning of primary school they tend to play in same sex groups, which develop separate "cultures" of activities and systems of interaction rules. Male groups often tend to develop forms of masculinity which oppose to the demands of schools with respect to achievement and social cooperation. Being masculine for these groups of boys is mainly connected to power, dominance and physical strength (Budde, 2005; Connolly, 2004; Francis, 2000).

These "cultures of masculinity" have been observed in several studies and may differ with respect to being compatible with achievement at school. In a study carried out by Connolly (2004) this is demonstrated already for children in their first year of primary school. In two case studies on two groups of 5 to 6 year old boys from two different Irish primary schools – one middle class school and one school from a working class area with high levels of deprivation – Connolly discovers that the form of masculinity adopted by the middle class boys was actually favorable to achievement

at school. These boys demonstrated dominance by specialist knowledge and technical skills. Boys in the working class area tended “to subscribe to a more externally-expressed form of masculinity with an emphasis on strength and physical prowess” (Connolly, 2004, p. 217). Middle class boys accepted being controlled and also that their time and activities were organized by parents and school. In this class there were also only very small gender differences in achievement. The author explains these small differences in favor of the girls by collusion of parents and possibly teachers for example in a restricted choice of reading material by boys and partly also in a rejection of diligence. Boys from a deprived socio-economic area were not used to such a high level of control and organization. Education was not significant in their social environment. Their dominant form of masculinity did not match with academic achievement. In this class the gender gap in achievement in favor of the girls was high, even though the girls grew up under the same unfavorable conditions.

In her interview study Michalek (2005, c.f. Budde, 2008) also verifies different cultures of masculinity for boys from the third grade – one form which defines itself by social exclusion and claim for dominance and a second one which rejects these kinds of traditional masculine behavior.

Especially for adolescents a certain “staging” of masculinity, mostly referenced as “laddishness”, has been discussed to be detrimental to educational achievement. In a study with 14 to 16 year old British students Francis (2000) demonstrated that this culture of masculinity mainly could be observed in working class boys: “Interest in masculine-typed activities such as football, the objectification of and sexual activity with females, an irrelevant and rebellious attitude to authority, physical strength, boisterousness, bravery, daring, camaraderie and ‘having a laugh’” (Francis, 2000, p. 124). Two other traits which are required of pupils in classrooms – obedience and diligence – were not compatible with this laddish culture, though being not compatible to almost all performances of masculinity.

#### **4.5 Interaction with teachers**

Boys’ social behavior connected with their performances of masculinity of course does have consequences for their communication and interaction with teachers and other students, especially with girls. Boys tend to dominate classroom interaction thus getting more attention and more academic and social intervention from their teachers. Feminist social researchers have labeled those processes as the “hidden curriculum” and pointed out that its result is a discrimination of the girls, who do not get enough attention from

their teachers and learn that their contributions to the instruction process are not important (Frasch & Wagner, 1982). But there are also authors postulating that boys get worse marks as a consequence of their uncooperative classroom behavior and that they hinder their own process of learning (and that of their classmates, especially the girls') by initiating time consuming disciplinary activities of their teachers (Brophy & Good, 1970, 1974; Younger, Warrington & Jaquetta, 1999).

There is some evidence for the notion that boys' disturbing social behavior and lacking cooperation affects their marks at school. Downey and Vogt Yuan (2005) attribute the worse marks of the boys in a study with 24000 American adolescents to this circumstance. According to their teachers, girls are "better classroom citizens", being more attentive, more cooperative, completing assignments and being less disturbing. However, there is no answer to the question why boys get worse marks: due to lower achievement or as a revenge for their negative social behavior. In standardized school tests for mathematics (not for language) boys in spite of worse marks did slightly better than girls. But in this sample this could be explained by boys' different leisure activities, which were more connected with computers and activities in mathematics and science.

Finally, it remains unclear for whom boys' social interaction behavior is more harming: for themselves, for the girls, who as a consequence are neglected by their teachers or for all persons involved, including the teachers who have to put a lot of effort in disciplining actions.

## **5. Need for intervention**

Looking at boys' and girls' attainment in the European and in other educational systems of the western world and also at the discussion on the causes of this situation it becomes clear that one has to beware of over-generalizing or over-simplifying the resulting picture. The so called "boy problem" has to be regarded differentially both with respect to certain variables beyond gender which influence the described phenomena, like e.g. a migratory background, and with respect to specific social circumstances in certain schools or even to whole regions with certain social and economic conditions.

Concerning the boys a need for intervention can be stated for the following fields:

- Reading – particularly reading motivation and reading interest, which have emerged to be crucial as moderator variables to reading achievement



- Social behavior – particularly with respect to cultures of masculinity which aim at obtaining power and dominance through destructive behavior (inside and outside the classroom)
- General attitude towards school and school work

The situation of girls in the educational system has considerably improved in the last decades in terms of levels of graduation and school attainments. Even in the fields of mathematics and science the gender gap appears to decrease. Nevertheless, there is still need for action in this field as girls still do not as well as boys. Besides, girls still make stereotyped choices of school subjects, apprenticeships and courses of study which have detrimental effects on their wages and career opportunities.

In spite of – at least on average – lower school graduations and lower reading abilities young men attain better jobs with better wages. Thus, for girls there still seems to be a need for intervention with respect to:

- Improving the self-concept of their own abilities and their self-efficacy especially in the field of STEM
- Support in planning a career both concerning the field of occupation and disclosing possibilities to combine engagement in career and family life.

## **6. Conclusion**

Finally, it can be stated that the boys' situation in European and in several non-European educational systems is indeed a cause for concern but in no case a cause for panic or non-reflected rashly actions. There is a lot of evidence, that the problem is an old one and just came to surface as a consequence of giving girls equal opportunity to participate in higher levels of education. Thus while discussing these issues in education policy one should beware of starting a competition as to which sex might be the most discriminated in the educational systems. Variables such as social class and ethnic background have much greater impact on the likelihood of achieving in school than gender. Keeping this in mind measures of intervention should be developed and applied that give consideration to the complexity of the problem instead of breaking it down to simple and bipolar solutions.

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## Ongoing training systems in France with regard to gender: « teacher effects » at universities

### 1. Introduction

Regarding vocational training, statistical evidence indicates inequalities in France for women's access to ongoing training opportunities. *Key figures in the equality of women and men*, a collection of statistical data published annually by the women's rights department and the Directorate General of Social Cohesion, indicate that « *in these two categories (blue-collar workers and white-collar employees), women have less access to training programmes; the largest gap is found in the public sector, to the disadvantage of white-collar employees and in the private sector, to the disadvantage of blue-collar workers. In the private sector where the access rate to vocational training, funded by companies, is higher the bigger the company, women have a lower access rate than men, except in companies with less than 50 employees* » (p. 32).

Inequalities are still found in the initial phase of the vocational training system, as women and men do not have the same opportunities of access. What is the situation "at the heart" of these training systems? We feel that it would be a heuristic task to introduce a detailed analysis, comprising the gender issue, university teachers' practices and verbal interactions found in trainings. For education as well as for training policies in France, two inter-ministerial conventions *for the promotion of equal opportunities of girls and boys, women and men in the educational system* from 2000 and 2006 re-assert, among other points, the aim of « *establishing gender equality in professional and educational practices of the agents of both genders in the educational system* » from primary to higher education.

On the one hand French research on gender in adult training is rather rare and focused on subjects dealing mainly with the issue of women in training, on the other hand. Beaumelou & Mora-Canzani (1996) highlighted teaching measures in training programmes designed for women, by means of individualizing, modularizing or alternating the learning. Ollagnier (1999) set out to show and develop the gender-related differences in adult learners with the aim of developing teaching practices adapted for each sex. In their investigation from 2000, Hayes and Flannery brought to light the fact that traditional frameworks of formal training are not adapted to the training of women

but also that participation opportunities play a major role for their training. More recently, now English being considered as necessary, the verbalization for women has been redefined in training contexts (Ollagnier, 2010).

Regarding the link to knowledge in adult training, there is also substantial research concerning women. The investigation by Belenky, Clinchy, Goldberger and Tarule (1986), on female learning in training programmes, influenced the movement to teaching by women, and had already highlighted the importance of adult instructors of both genders to correct their practices, their convictions and to allow the participants to express themselves to improve their training. In 1989, Hayes defined the main principles of this feminist teaching: not only are all the educational needs of women effectively met in traditional educational models; but education must also constitute a means leading to personal development and social change in order to meet these needs (Ollagnier, 2010).

Many studies have dealt with the relationship of knowledge and women in adult training, with the focus being the development of feminist teaching. We have established a different research focus of adult training, which deals with the issue of coeducation for women and men in the training at the university, more specifically the « teacher effects » in adult training. Adult learning is a special type of learning, the existing approach of nearly ignoring the gender issue in adult training, however, leads us to use the previous scientific research on this issue in the educational system as our basis.

In France the gender issue in teaching practices has been substantially examined, mainly in the primary and secondary school fields. It is an undisputed point in educational science (Durand-Delvigne & Duru-Bellat, 1998; Baudoux & Noircent, 1995; Jarlégan, 1999), that both male and female teachers subconsciously develop different expectations towards girls and boys which are expressed in their attitudes and teaching activities in the classroom. Regarding classroom interaction, recent studies show a distribution of 55% for boys and 45% for girls (Younger & Warrington, 2002). According to these authors, boys participate more in class than girls, whether it is for reacting to the male or female teacher's requests or to spontaneously interrupt the class session by asking a question or making a comment. According to Jarlégan, Tazouti & Flieller (in press, p. 3), «*girls tend to be exposed to an interactional dynamic dominated by boys, at least in scientific subjects and this results in the girls having less stimulating classroom interaction* ». Unintentionally, the male and female teachers give an implicit message to the students in the class; girls and boys are consequently brought to develop a different approach to knowledge and a gender-based perception of their own abilities and attitudes.

Based on this assessment, we've taken a closer look at the role of teaching practices at universities regarding adult learning in training programmes. We have examined the presence of « teacher effects » at universities through persisting phenomena of gender-based expectations in higher education.

As for primary and secondary education, we feel it is essential to develop the issue of coeducation in adult training in relation to the analysis of university teaching practices according to gender, but moreover to develop the analysis of practices, i.e. regarding a gender-based behaviour in adult learning and the phenomena of implicit gender-based expectations found among male and female university teachers. As a consequence, we have initiated our exploratory research work by taking as our subject the verbal interactions between the male and female university teachers and the adults in training with regard to gender (Avenel & Fontanini, 2009).

After defining the basis of the study and hypotheses of the phenomena of gender-based expectations at the university, we will expand this exploration with new research. We have asked ourselves this question: What is the role of gender in verbal interactions, through the frequency and type of interventions between university male and female teachers and adults at universities in France? We hypothesize that the training staff, without any training in this gender-based issue of adult learning, will develop the same behaviour and attitudes as that observed with male and female teachers of primary and secondary schools.

In order to examine adult-training systems with regard to gender, we have collected a corpus of video observations in the classroom. Our aim is to analyse the role of gender in university teaching practices, based on the observation of the type of verbal interaction in class according to gender (frequency and type of intervention, encouragement to participate ...) between male and female university teachers and adults in ongoing training programmes.

This article presents the results of our study on the impact of the gender-based representation of male and female university teachers on adult learning in ongoing training sessions, with a corpus of video observations at the University of Montpellier 3.

## **2. Methodology**

Our sample is made up of two coed groups of adult students at the University of Montpellier in France.

Table 1: Distribution of the Sample

Periods	Trainings	Men	Women	Total
2008-2009	University degree Preparation in Trainer functions	9	11	20
	2 <sup>nd</sup> year Master's Degree program Counseling, Training, Education	3	16	19
2009-2010	2 <sup>nd</sup> year Master's Degree program Counseling, Training, Education	7	12	19
Total		19	39	58
% Men & Women		33%	67%	100%

The first group, a second-year Master's Degree programme, "Counseling, Training, Education", consists of twenty-eight women and ten men aged twenty-five to fifty (some of the students have chosen the teacher training). The second student group consists of trainees studying in order to get a University degree ("Preparation in Trainer Functions") which will allow them to become adult trainers. It is made up of eleven women and nine men aged twenty-five to fifty-five.

We are aware that our sample is not completely representative of a coed class, the two groups of students in the Master's have more women (67%) than men (33%). But a minute analysis has allowed us to reveal some distinct elements and characteristics of gender-based verbal interactions between the training staff and the adults in training.

Table 2: Distribution of trainers and Session Time

Periods	Number Men	Number Women	Time/session	Total time
2008-2009	2		5 x 3h + 1 x 1h30	16h30
		1	5 x 3h	15h
2009 – 2010	1		1x1h01	1h01
		2	4x1h01	4h04
Total	3	4	16 sessions 36h35	Men : 17h31 Women : 19h04



Our sample is made up of three male and four female trainers. We have filmed the sessions in the classroom and we have created an observations scale from an exploratory study about the same subject of this research (Fontanini & Avenel, 2009). So, we have created categories in order to re-group the communications observed between the training staff and the students (for example exchanges, questions ...).

Our aim is to reveal the different forms of verbal interactions with regard to gender between the trainers and the adult student group.

### 3. Results

Table 3: The total amount of trainer's communications (gender not considered) towards students (gender not considered)

Type of communications	Communication towards students (individually)	Part of communication towards students	Communication towards the whole group	Part of communication towards the whole group	Total
Trainers	668	45 %	809	55 %	1477

We have recorded another 1477 contacts from seven trainers. Trainers have more group interactions: the majority (55%) of these is directed towards the whole group.

Table 4: The distribution of male and female trainers' individual communications towards students (gender not considered)

Gender	Communication towards students	Part of total communications
Female trainers	417	48 %
Male trainers	251	42 %
Total	668	100 %

We note that male and female trainers communicate almost as much towards students. We observe also that the time of monologues to the group is the same from male and female trainers. The time of monologue for the female trainers represents 23.7% of the total time sessions. For the male trainers, it is 22.9%.

Table 5: The distribution of male and female trainers' individual communications towards students (both genders)

Gender	Communication towards women		Communication towards men		Total
	number	%	number	%	
Female trainers	222	53%	195	47%	417
Male trainers	168	67%	83	33%	251
Total	390	58%	278	42%	668

When we observe the distribution, we find that the majority, or almost 58%, of individual communications is directed towards female students, versus 42% towards male students. For our study, the training staff communicates more with female students, especially the male trainers. That means that the trainers, especially female trainers, have more individual communications with male than with female students, according to the representation of the men and the women of our sample. For the male trainers, we can state that the percentage of their individual communications with students is more proportionate with the percentage of male and female students. But we must not forget that the female students (66%) are more numerous than male students (33%) in our sample.

Trainer communications have been categorized as follows:

- exchanges (1)
- asking the students questions (2)
- spontaneous contact with a student (3)
- when the trainer allows the students to speak (4)
- a request for the student to develop their answer (5)
- a request for a student to give an answer to the group (6)

Table 6: Categories of Trainer Communications

Gender	(1)	(2)	(3)	(4)	(5)	(6)	Other	Total	Part of total
Female trainers	268 (64%)	44 (11%)	43 (10%)	35 (8%)	8 (2%)	8 (2%)	11 (3%)	417	65%
Male trainers	180 (80%)	15 (7%)	6 (3%)	8 (4%)	6 (3%)	0	10 (4%)	225	35%
Total	448 (70%)	59 (9%)	49 (8%)	43 (7%)	14 (2%)	8 (1%)	21 (3%)	642	100%

When looking at the distribution of all the communications with female and male students, we realize that male teachers have more global (overall) verbal interactions with girls than with boys (67%). We can thus highlight that the percentage of interactions of these male teachers is, once again, proportional to the percentage of female students of our sample (67%). On the other hand, female teachers communicate individually as much with male students as with female students but if we look at the percentage of female and male students in our sample group, these university teachers have less verbal interactions with the women.

If we closely examine each category of communications with the percentage of male and female university teachers with the male and female students, we observe that the female teachers direct fewer questions to female students (2) but have a few more communications with them (1). However, for the following categories: «*allows the student to speak*» (4), «*a request for the student to develop their answer*» (5) and «*a request for a student to give an answer to the group*» (6), we observe an equal distribution between male and female students by the female teachers.

For male teachers, most of their communications are directed towards female students except for two categories: «*when the trainer allows the students to speak*» (4) and «*a request for the student to develop their answer*» (5) with the majority of the recipients of these communications being male.

Based on these results, we can provisionally conclude that the interactions of teachers of both genders towards male and female students are roughly evenly distributed ... but it must be noted that in our sample, female students are more prevalent (67%). Thus, in a situation of perfect equality, we should observe about 67% of teachers of both genders having communications towards female students for each category. Yet, this is almost never the case, except for categories (1) and (2) by male teachers.

Table 7: The Distribution of Trainer Communications According to the Category, Gender of the Student and Trainer's gender

Categories of trainer communication	Communications with women	Communications with men	Total	Part of communications with women/men
<b>Female trainers</b>				
(1)	138	110	248	56% / 44%
(2)	17	27	44	39% / 61%
(3)	18	25	43	42% / 58%
(4)	18	17	35	52% / 48%
(5)	4	4	8	50% / 50%
(6)	4	4	8	50% / 50%
Other	4	7	11	36% / 64%
<b>Total</b>	<b>203</b>	<b>194</b>	<b>397</b>	<b>51% / 49%</b>
<b>Male trainers</b>				
(1)	148	66	214	69% / 31%
(2)	15	2	17	88% / 12%
(3)	4	2	6	66% / 34%
(4)	3	5	8	37% / 63%
(5)	1	5	6	17% / 83%
(6)	0	0	0	0% / 100%
Other	5	5	10	50% / 50%
<b>Total</b>	<b>176</b>	<b>85</b>	<b>261</b>	<b>67% / 33%</b>

- (1) exchanges;
- (2) asking the students questions;
- (3) spontaneous contact with a student;
- (4) when the trainer allows the students to speak;
- (5) a request for the student to develop their answer;
- (6) a request for a student to give an answer to the group

Male students make up the minority in our sample group, yet verbal interactions between the trainers of both genders and the men are predominant in some categories. The male trainers interact more with them (80%) to develop an answer and the female trainers ask men more questions (60%).

These results reveal that the male students in our sample receive more cognitive interactions with male and female teachers. These types of interactions allow students, in general, a development of their thinking, an opportu-

nity to assess their problems and to get the necessary feedback to make progress towards new learning and autonomy.

The results of this research correspond to those obtained during our exploratory study of the same subject matter with only 4 male and female teachers, one woman and three men (Avenel & Fontanini, 2009).

#### 4. Conclusion and further work

According to our study, based on a sample of female and male professors at the University of Montpellier 3, it appears that they (both genders) interact individually, from a quantitative point of view, more with female students, altogether. However, from a qualitative point of view, female professors have more cognitive interactions with men, instigating the necessary feedback for learners of both genders. These university teachers of both genders repeat some practices observed in the teaching staff of primary and secondary education. This unequal treatment by male and female university teachers may result in male and female students developing a different relationship to knowledge and a gender-based perception of their own skills and abilities; even more so, because these male and female students have been experiencing this type of teaching interaction since their early childhood...

The Eurydice report *Differences between genders regarding academic achievement: A study of the measures taken and the current situation in Europe* published in 2009 by the European Commission points out the lack of the focus on gender training in the initial and secondary training of primary and secondary teachers:

- « *Education authorities of many countries know that gender can be an optional subject matter in the initial training of teachers. In Belgium (French Community), in Denmark, in France, in Austria, and in the Netherlands, the subject of gender as a subject in itself should be taken into account in teacher training* » (p. 100);
- « *The same situation exists concerning activities of professional development designated towards teaching personnel. Public institutions only foresee gender issues as a subject matter in ongoing training or seminars* » (p. 101).

A French initiative however is mentioned, a national seminar regarding gender equality in the educational system organized in 2008 at the *École Supérieure de l'Éducation Nationale* (Superior School of Higher Education). Its aim was to create awareness by the national education administrators, re-

garding the diversification of girls' and boys' careers and the impact of coeducation on student behaviour.

The assessment remains mixed; however it has resulted in some improvements, mainly with regard to beginning or ongoing gender training of male and female primary and secondary school teachers. We feel it would be desirable to continue this analysis and the efforts in the context of adult training at universities, i.e. through a first attempt to impart gender awareness to female and male professors through the analysis of professional practices.

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## **The impact of gender knowledge on one's behaviour at a micro-social level – based on statements from learning adults**

### **1. Methodological notes, pilot study**

An inspiration to take up this particular research were the university students, participating in a course on culture genderization and the feminist thought, who spontaneously and repeatedly informed about changes in their behaviour under the influence of the lecture's content.

The study has been planned with reference to Alain Touraine's theoretical concept of the social subject. According to this contention, subjectivity means freedom and creativity which is expressed in the self-construction of individual identity. The process of subjectivation lies in making personal choices. These choices however are made in accordance with one's mental and social preparation, for example connected with one's social participation. In order to become a subject one must „ (...) recognize oneself as a person and recognize one's personal will to subjectivation at the same time” (Touraine, 1992, pp. 242–243; 1997).

The research design has been based on the assumption that all knowledge exerts significant influence on one's views and beliefs and consequently determines people's actions as well as enables an individual to self-monitor these alterations. Moreover, it has been presupposed that learning about sources of social inequalities between men and women and the way gender stereotypes function may result in either conscious approval of genderization or objection to the process. The latter might lead to creating and implementing one's self-concept of social participation, if possible independent of gender models. Based on these assumptions following questions were formed: Suppose there have been changes in your behaviour observed as an effect of recently gained knowledge about the sex/gender system. What do these changes consist in? Do they testify to social subjectivity of men and women who took part in the study?

The empirical basis of the article is constituted by the results of an investigation (hereinafter referred to as 'main fieldwork') conducted on January 16th 2011 at the University of Lodz through a random survey carried out among third-year social work students of extramural first-degree studies. This is a free undergraduate course financed by the European Social Fund in

Poland as a part of a project 'Improving Professional Qualifications of Social Integration and Social Welfare Workers' (no. U/58/ZP/2008) for the years 2008–2011, within the frameworks of the 'Human Capital Programme').

A pilot study had been run two weeks before the main fieldwork in a comparable sample group of respondents. The pilot study was conducted through a random survey in which, except demographic questions and filtering closed response ('Did you manage to observe any changes in your behaviour with reference to recently gained knowledge on feminism?'), there was put an open response: 'Please describe what precisely these changes consist in?' The questionnaire was handed out to 44 persons. Out of 28 questionnaires with a positive response to the filter question, 27 (21 filled in by female students and 6 by male ones) were submitted to further analysis. The aim of the pilot study was to find out, in what categories the respondents describe changes in their personal behaviour that can be attributed to the impact of gender knowledge.

As a result of the analysis it turned out that all answers of the interviewees can be divided into two categories: changes in awareness and changes in behaviour. Almost all male respondents solely noticed a change in their own apprehension of a woman's social role and her social status whereas the majority of female respondents observed differences both in their perception and the way they acted. One third of the 21 female students who took part in the pilot study precisely described changes in their awareness. The respondents recognized the mechanism of social gender stereotypes, unfair distribution of family household duties, what the interviewees had ceased to regard as 'natural', immutable and obvious. In addition, some respondents pointed at a general change in their attitude towards women, as a social category.

Based on the analysis of answers given to the open response of the pilot study it has been decided to create the main fieldwork questionnaire in order to obtain statements specifically on the subject of a change of awareness, differences in one's attitude towards one's self as well as changes in behaviour in the family, at work and among friends and acquaintances.

Furthermore, it seems that the evaluation of the results of the pilot study has revealed that the process of socialization of those interviewed is gender-biased. Statements made by male respondents, besides reflecting the awareness change in general, match the cultural ideal of masculinity, according to which a man ought to think abstractly, think broadly, deliberate over principles, hierarchy, order etc. However, as far as patriarchal order is concerned, in which by definition men obtain higher social status, nothing prompted them to a reflection over the foundation of this social order. Opinions formed by 7 male students (of 17 who admitted a change in their manners influenced by gender education) proved the fact that these men had never re-

flected on the reasons for social status inequality between men and women ever before, not to mention the issue of women's social situation.

On the other hand, opinions of interviewed female students, who in accordance with the cultural model of femininity ought to be passive, emotional, focused on details, trifles and in particular on needs of the others, substantiated that in the process of socialisation they had internalized such a definition of a woman's role. Until now they had been preoccupied with what other people needed – that they had taken all or most of household duties upon themselves, they had had low self-esteem and only recently 'built greater self-confidence'.

In some of the female students' views, knowledge gained during the lecture allowed them to reflect on their lives more critically, to perceive peculiar signs of social gender inequality (for example, men usurping the right to dominate within a co-educational, public space) and to analyse men's and women's behaviour 'in their own environment'. Finally, it had encouraged them to promote a partnership model of relations between genders in the family.

It is also worth mentioning that, with the exception of a few, women were far more precise than men in characterizing their awareness change, especially when writing about alterations in behaviour towards their self.

## **2. Main fieldwork, description of respondents**

All respondents participating in the second survey, i.e. main fieldwork, were university students enlisted from social workers from the city of Lodz and the Lodz Region by Regional Social Welfare Centre and as a result 48 applicants have been admitted, including 47 women and 1 man (in Poland this profession is feminized).

Taking into account the answers given in the pilot study it has been decided for the second survey not to ask straight about awareness change, either, but to form questions directly about changes in behaviour. The interviewees were also suggested to arrange their answers according to an order developed during the pilot study. Using the typology was not compulsory (only 2 out of 48 ignored it).

A random survey consisted of demographic questions and three inquiries. The first question was a closed response and served as a filter ('Do you notice any influence of the knowledge gained about feminism on your own behaviour towards yourself and others?'). The second question was an open response allowing respondents to arrange their written statements with the help of a typology of an individual range of activities at

a micro-social level indicated by a researcher ('Please specify what area the knowledge influence refers to and what it consists in according to your current behaviour: a) in the family b) at work c) in relationships with friends and acquaintances d) towards yourself e) what else').

Average age of the participants equaled 43. The only male student in the group was aged 41. Age structure of interviewees in the second and main study was as follows:

25–35 years old	–	6 people
36–40	–	10 people
41–45	–	12 people
46–50	–	15 people
51–55	–	4 people
56 and more	–	1 person

All respondents had at least secondary education (47 persons) and one interviewee had already obtained a bachelor degree in another field of studies. Regarding the marital status of the participants of the survey, 33 declared to be married, 4 women lived in informal relationships, 10 women were singles (unmarried, widowed, divorced). There were no data about the marital status of one female student. One sixth of the interviewees (8 women) were childless. Almost half (23 out of 48 respondents) had two children, 11 people (including the single male interviewee) were a parent of one child, five female students had three children and one was the mother of four. All participants from the main fieldwork had enrolled on a university course at least several years after completion of a high school education. Therefore, they belong to a fixed category called 'learning adults'. Finally, during their fifth term all of them had attended an optional 30-hour course titled 'Feminism: Then and Now'. Of all 48 interviewees 46 admitted that it was their very first encounter with the feminist thought, the culture genderization phenomenon and with an organised set of information about social gender inequality, etc.

The main fieldwork was conducted a month after course completion when all the students had already earned their credits.

### 3. The results of the study

Taking into account the specific sex structure of the group caused by the main fieldwork statements the single male student was analysed separately in the second survey.

It turned out that all of his answers were one sentence long and had a form of a promise; therefore they were even shorter than responses of the male in-

interviewees in the pilot study. First, two statements informed about his intention to change his behaviour both in the family and at work: "I'll try to be more of a partner to my wife" and "I'll be a bit more tactful". Next two answers declared his application of gained knowledge to "understanding women's problems" and "understanding women's claims" (M 1). These statements were positive but rather vague and general in their character and at most they may be regarded solely as an indication of the exchange of the current family model for a more egalitarian one.

The analysis of statements made by the female students (45), who answered the filter question positively, showed that almost all (except one) noticed some change in their awareness and attitudes influenced by recently gained gender knowledge and hence gave many examples of alterations in behaviour both towards themselves and others.

Intrapersonal changes, meaning transformation in one's awareness and attitude towards one's self, were mentioned most frequently (51 indications), followed by a change in relations with friends and acquaintances (38) as well as between family members (also 38 indications). Least frequently observed were the differences in relations with co-workers (31 indications). 'Other' changes were mentioned 15 times. (Comment: the choice was not limited to one answer, thus the maximum amount of indications may have surpassed 45).

Statements by female respondents cited here have been marked with numbers ascribed to each questionnaire.

### **3.1 Change of awareness and in attitude towards one's self**

Having studied the opinions of female interviewees in which they described the impact of recently gained knowledge on personal awareness it may be presumed that the students' perception of the subject-matter is a step towards feminization (Malinowska, 2001).

The respondents' statements revealed that as a result of recently gained knowledge first of all they became conscious of the fact that they lived in a patriarchal society: "I've discovered a patriarchal pattern of behaviour within my family. My awareness has increased. [...] I've noticed that even in my son's kindergarten the message sent to infants is full of patriarchal undertones" (3); "Many women are unaware of their rights, therefore it is necessary to promote the subject of feminism" (5); "The information I learned helped me to understand how important partnership is in various spheres of life, especially in family life" (13); "I realized women are indeed expected to meet far too many demands. [...] Everyone thinks it's normal that wom-

en do the bulk of the work. People feel fine with it and they don't want anything to change" (14); "I see that women in my family were raised according to patriarchal family standards" (27); "I became aware of the fact that I'm as equally important as a man is" (30); "The knowledge I gained allowed me to recognise the problem of a woman's value and role" (32); "[...] the lectures and gained knowledge increased my awareness not only of my own rights, but also of men's [...] To a certain extent relations with my partner and other people have improved; in a sense [...], their quality was upgraded" (44).

Secondly, some women noticed that the knowledge they gained supported their understanding of their own place within society and helped them to recognize social discrimination of women, also in the home and at work: "Knowledge about feminism allowed me to look at myself and at my life up to now from a different point of view. That is, I think about my situation more often, care more of myself and stand up for my rights" (35); "Some cases of discrimination against women annoy me. I didn't pay attention to that before" (27).

Thirdly, as it is revealed in many statements, having learned about gender issues, a lot of interviewees stopped reproducing patriarchal order blindly and, above all, abstained from stereotypical thinking of masculine and feminine roles within the domestic sphere: "I'm more aware of certain things. [...] I followed my mum's example and she worked hard all her life. I have noticed I could change my behaviour in a way, affect my relatives so they could improve their lives" (39); "The knowledge gained enabled me to better understand myself, my feelings, views, [...]. Thanks to it I know there's no need to agree to various types of behaviour only because they are assigned to a particular gender role. One may be happy and satisfied, both as a woman and as a human being, by choosing a different way of life, which is not enforced by one's social environment. These lectures helped me also to understand men who are socialized in a particular way" (11).

In female students' opinion, their attitude towards feminism and feminists has changed owing to the knowledge gained. First and foremost, they rejected the popular definition of feminism and the negative stereotype of a feminist: "My knowledge about feminism has been completely erroneous up to now [...] After the series of lectures I understand feminists and what pleases me most is that despite standing up for the equality of rights they remain women. The knowledge gained made me realize that I am a feminist, in a sense" (10); "I've stopped regarding feminists as 'butches' and singles who have too much free time" (16). Moreover, some women admitted that as a result of gender education they had acquired a positive feminist identity: "Learning about feminism I felt relieved and realized that for so many

years I had been living in ignorance, I had felt guilty of being a woman and took pains to be like a man (strong). Now I felt a sense of relief and satisfaction that I was a woman. I rediscovered my feminine features as assets” (12); “I’m glad to be a woman and I think that many men feel lost nowadays. Such lectures should be available to everyone who is interested” (11).

Affirmation as a woman also creates a positive change in attitude towards one’s self. Almost half of the respondents (28 out of 45) claimed an increase of their self-esteem, a greater tendency to self-acceptance and a ‘feeling of an inner power’: “I feel more sure of myself and I feel appreciated” (5) “My self-regard has increased” (8); “I gained more respect for myself, for what I do and how I do it” (9); “I esteem myself more and more. [...] I’m bolder in all fields of my activity and I know it should have happened earlier” (20); “[I am] less critical towards myself and more self-confident” (22); [I’ve learned] to believe in my strengths, not to give up in difficult moments, not to feel worse but be brave, believe in my own values, skills and abilities” (23); “[...] Today, I know that I myself also matter and what I feel and wish to do is important [...]. I have greater distance towards everything” (29) “The knowledge gained allowed me to reconsider many issues, understand myself and others. My self-esteem has grown for sure” (32); “My awareness has increased so that I’m capable of managing various spheres of life (family, household duties, work, education) at the same time. Still however, I don’t need to be equally perfect in each and every one of them [...]” (34); “[...] I take care of myself” (35); “a greater inner power [characterises me]” (37).

It is worth underlining that such statements as cited above also reveal the scope of previous social objectification and current process of emancipation from this state. Women have gained self-esteem, confidence in their skills and strengths and accepted the importance of their values and needs. They express lack of consent for the social debasement of feminine features and the values they share. Some female interviewees rejected altruism and concern as an ethical basis for women in a patriarchal culture which, according to what Sandra L. Bartky claims, exposed them to a threat of getting lost in objectification (Tong, 2002, p. 220). They got rid of dependency and negated the weakness which is attributed to women (‘the weaker sex’) and which deprives them of the courage essential for gaining independence and self-reliance. It is also worth mentioning that one of the female respondents in her description of how she’s changed being influenced by the knowledge gained defined this alteration as growing in ‘greater inner power’. This expression reminds of a ‘sense of strength’, a term introduced by Alfred Adler (Tong, 2002, p. 183). According to his concept such a feeling signifies having achieved psychosocial maturity. “Therefore, does it mean that adult fe-

male respondents (being influenced by freshly gained gender knowledge) described the process of growing out of the infantilism which is enforced on them in patriarchal culture?

On the other hand, one third of the female respondents claimed that their personality was changing thanks to the knowledge gained. They became more assertive, discovered how pleasurable it is to treat oneself well or even showed a little bit of egoism based on considering their desires and needs: “I do things which give me satisfaction. I find time for myself and now I always ask myself a question: ‘am I important’. ‘If yes, do something for yourself so you will feel better’” (2); “My attitude towards my own needs has changed. I try to think of myself, too, and not only of the members of my family” (4); “More time for myself, [I see] a woman in me, not only a mother and a wife” (45); “My personality has strengthened” (26).

In other statements the female respondents described changes in their family function which resulted in refraining from the thoughtless reproduction of the traditional role of a woman and the refusal to perform all everyday household duties without any help (3, 13, 27, 46). Requests for support and participation in doing everyday jobs around the house were mentioned, too (31, 34, 38, 43, 46): “With regard to sharing the duties, I try to be more assertive” (16); “[...] I have the right to have some time only for myself” (34); “I used to feel that if something wasn’t done at home, it was only my fault. Now I’m aware that not all housework is part of my duties. My husband and children live in the house as well, they are healthy and fit so they can have a share” (38).

### **3.2 Behaviour change in relationships with other people**

If the number of women describing the changes in their behaviour in their families, at work and in relations with friends and acquaintances is an indicator of subjectively estimated degree of the current patriarchisation of these groups and social circles, this index would have to be similar, though not as strong with regard to the work group.

After all, writing about various aspects of the change of their behaviour in their families (only women did not observe such changes) almost half of the interviewees mentioned that they had introduced a new standard for the distribution of duties connected with the everyday functioning of this group: “I made other members of the family join the housework and I don’t feel sorry for this – before I felt some guilt” (4); “I demand an equal distribution of the housework. I’ve taught members of the household, especially



men, that they should have an equal involvement into the development of our family [...]" (5), etc.

Nevertheless, slightly more often the female respondents informed about an intention to modify the recent division of responsibilities within the family: "I try to talk to my husband, to help him get used to the concept of sharing duties" (16); "[...] I distribute household duties more clearly, make my husband realize that I simply have the right to take a rest because I work too and, besides, I'm studying now, which I had no time for, when I was busy raising children" (31); "I noticed an absolutely unfair distribution of housework among the members of the household. So far, we all assumed that this is how it has to be. I'm trying to change this by and by [...]" (34).

In this context, though rare, the statements describing partnership relations among family members sound optimistic: "I gained knowledge that helped me to understand how important partnership is in different spheres of life, especially in family life. I appreciate my husband who supports me in lots of everyday household duties and treats me like a partner [...]" Many men don't react like this [...]" (13); "There wasn't much to do in my immediate family [...]" (38).

Few interviews revealed that female students began to control the way women are treated in the family: "I've started to pay attention to my husband's behaviour towards me, how my sons-in-law treated my daughters. I don't allow my husband to disrespect me or my work" (9).

The analysis of the statements on changing behaviour patterns referring to relationships with acquaintances (no changes were observed by 6 female respondents) reveals three types of changes. The first type consists in the conditions of the participation in this social circle and is connected with an increase in self-esteem. Greater self-confidence of the respondents allows them to be assertive and enables them to show their needs to friends and acquaintances more boldly. The knowledge gained gives female students the courage to express their opinions and to stand up for them: "I feel able to say something I wouldn't have dared to say before. And I feel fine with that. I know what I want" (2); "I'm bolder to speak out my views in public" (7); "I'm more open to a decent talk and to express my opinion" (15); "I can stand up for my opinions and do not become irritated or spiteful" (44).

The second type of changes of behaviour patterns in relationships with friends consists in opposing to patriarchal practices nowadays: "More often I get into situations which annoy me, also with my friends or acquaintances. For example, when a woman (a female friend) 'works like an ant' and a man doesn't even think of helping her. Now I am able to point this out to them, to my female friend rather than to her partner" (14); "I don't tolerate sexist jokes [...]" (18).

Finally, the third type of changes in female students' behaviour towards friends and acquaintances is based on taking up a new role within this social circle. At least one fourth of the respondents declared that they have conveyed the knowledge gained during the lecture and have educated others on gender issues: "I talk with my friends about my observations, tell them about what I've learned in the lecture, make them realize certain problems" (3); "I'm trying to educate my female acquaintances in this matter, both girl friends and their partners. In relationships with men I meet great resistance to learning about such issues" (4); "At work, like in the family, I have started discussions about this topic, enlightening others on feminism, the real, the clear one and not the one men laugh at" (12). "Talking, for example, to a girl friend I try to share the knowledge I gained and sometimes to 'open their eyes' that we, too are important" (22).

As it was said before, women wrote about the impact of gender knowledge on their change of behaviour towards co-workers more rarely (9 female respondents didn't describe such changes). Although patriarchal relations may be and often are reproduced also by women (Hearn, 2008), for female students participating in the study a high feminisation of their work environment did not have to do with the problem of culture genderization, social gender inequality etc.

However, some of the respondents have confirmed that there were changes in their behaviour also at work. It is possible to put their statements into similar groups as we did regarding their behaviour towards friends. Therefore, the increase in self-esteem has contributed to the fact that the female students started to pay attention to how they are treated at work: "I became more self-confident, which affects my relations with co-workers, I don't let them abuse me anymore" (19); "A certain kind of men's patronising attitude towards women became clear to me as well as I see smaller chances for women's promotion to particular positions [...]" (34). Other female respondents started to notice the occurrence of gender inequality in a work group, to observe patriarchal manners and to fight for the equality of rights: "In my workplace I noticed that my boss, who happens to be a male [...], looks at women differently and favours men" (3); "I'm better at detecting the negative attitudes towards me" (6); "[...] I found out that men are privileged at work, that the management treats them better. Men also take advantage of these facts" (9); "I pay more attention to the relations between co-workers, work allocation, gender relations" (33). Finally, some of the women have also declared that they have spread the gained knowledge at work: "I boasted about what I've learned and shared thoughts with my female friends. I wanted them to 'wake up', too" (12).

## 4. Conclusion

When summing up, it is necessary to point out how vast the range of ignorance in terms of social gender inequality is among those who participated in the lecture. At the same time, however, the level of interest in the course's content proved to be strikingly high, especially among adult students.

The conclusions drawn from this investigation cannot constitute any basis for generalisation. Nevertheless, their substantial summary reveals some tendency of a change attributed by the students to the knowledge about the sex/gender system, its functional mechanism and the social consequences of practicing it.

According to the respondents' statements, such knowledge affects changes both in awareness and in behaviour, which a sociologist may define as follows:

- a) increasing feminist awareness;
- b) modifying behaviour in the family more often towards a partnership model (more often an intention to introduce such a change);
- c) developing a subjective sense of an advancement in the social position among friends and acquaintances as well as in a work group, which is connected with the increase in self-esteem;
- d) acquiring skills to detect various aspects of social gender inequality – as a result of the increase of feminist awareness;
- e) taking up an individual fight with patriarchal practices;
- f) popularisation of gender knowledge in one's social environment – in the family, at work, among friends and acquaintances.

These changes testify to respondents' emancipation from objectification and to constructing their social subjectivity. For in both main tendencies of change in the attitude towards one's self one may notice Touraine's "will to subjectivation".

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## **Women's choices in STEM – statistical data and theoretical approaches explaining the gender gap**

### **1. Introduction**

### **2. Women and STEM – some data and facts from the German situation**

In the so-called STEM subjects and professions (Science, Technology, Engineering, Mathematics) women are less represented than men. With mathematics and sciences combined, the number of women is considerably lower in STEM subjects. While the number of male students shows cyclical fluctuations in Germany, those of girls beginning their studies have kept growing constantly, i.e. from 20.000 in 1995 to almost 40.000 in 2008 (National Pact for Women in STEM, 2011). Looking at the STEM fields separately, physics and astronomy are found to be “male”, in chemistry and mathematics women have already caught up with men, e.g. half of those beginning their studies in chemistry were already female in 2008. Thus chemistry, like biology, can already be regarded as a “female” science. More women than men have begun their studies since 2006, in 2009 their part was 52%.

A glaring contrast to this are the engineering sciences, e.g. electrical engineering, where only 10% of the graduates were female in 2009; in mechanical and process engineering their part was 19% after all. Like in physics the numbers of female graduates are only rising very slowly here, whereas the numbers of male graduates – after a sharp fall in 1996 – have kept growing constantly again since 2003. Nevertheless in engineering sciences the number of female students has gone up slightly, too.

Also in information technology females beginning their studies are still a minority (19%). This is especially true in “pure” information technology; other fields like informational economy (about 15%), management (about 35%) or computer visualization (about 20%) attract more female students.

With female and male teachers a contrary trend has developed, the percentage of female teachers has increased during the last decades (cf. Wößmann, 2008), but interestingly more and more female teachers have decided to teach STEM subjects, too. At many universities, e.g. at the University

of Koblenz-Landau, considerably more female than male teacher students choose biology, chemistry and mathematics as their main subjects.

### **3. The gender gap in other countries**

Looking at our neighbouring countries we can identify the same trends as in Germany. In general women in all EU countries are strictly segregated vertically in their scientific carriers. There are meanwhile a majority of female students (55%) and female graduates (59%) at European universities or colleges, but the higher the degrees of qualification, the smaller is the number of females, from 45% with a doctor's degree to only 18% as professors (European Commission, 2009). It is only 10% with professors of higher degrees. The most extreme situation for females is in sciences and engineering again, only 31% of the students, 36% with a doctor's degree and 7.2% of the professors are female.

There are, however, clear differences between European countries, especially with regard to the STEM field. The female part here is much bigger in the Eastern European – former socialist – countries (especially in Bulgaria and Romania). Also a look at the OECD states shows big differences between the countries. While the average part of female science students is 31%, there are countries where it is much smaller (16% in Japan, 23% in the Netherlands, and 24% in Switzerland). In Denmark, Iceland, Italy and New Zealand already more than 35% of the women who begin their studies choose a science as their subject (Education at a Glance, 2008).

The reasons for the differences between the countries can be found in various factors of their political and social structures, e.g. a country's educational system and economic situation, as well as in its institutions, e.g. the structure of its universities and colleges, its business organizations and enterprises.

### **4. Gender and vocational career**

Even more gender differences than with students can be found in the occupational education in Germany. A clear majority of young people (58.1%), who are dually educated in a business and a vocational school, are boys, at full-time educational institutes there is always a majority of girls. Boys are often more successful in entering their occupation after their education because of their higher self-confidence.

When you ask young people about their favourite occupation most of them strictly follow traditional gender roles. E.g. in Germany 39.9% of the boys asked chose car mechanic (7.7%), machine mechanic (5.2%), electro technician (3.5%), and metal worker (2.7%) – all clearly technical trades. 53.3% of the girls named clerk (6.9%), shop assistant (6.6%) and hair-dresser, dental assistant, industrial or hotel clerk (together 17.7.%) – all of them commercial and service occupations and none from the STEM field (BMBF, 2008).

Technical and IT occupations were named very rarely, only about 12% of those who chose the new IT occupations were girls. Possible reasons for this can be understood when we look at the attractive occupations separately. Of the young people who had decided to become “IT system electronics” – one of the four occupations newly created in Germany in 1998 – only 5 were girls in 2002, whereas of those who were trained as – “organizers for digital and print media” 55% were girls. Other authors point out that when an occupation is given a different name it is often much more or less attractive for girls or boys. When e.g. a “mathematic-technical assistant” became a “special informatics technician” not 60% of those who chose it were girls any longer, but only 20% (Borch & Weissmann, 2000).

Gender segregation in the STEM field is influenced not only by occupational gender stereotypes but also by images of science and technics created in our culture. The traditional figure of a scientist and engineer, seen as a doer, inventor and lonely fighter definitely has male characteristics. The same is true for the informatics engineer as the bespectacled “computer nerd”. As women are only a minority in the STEM field there are no famous female examples to be imitated; women like Marie Curie can only be seen as exceptions and no present-day female role models.

The attractiveness of STEM occupations is influenced by the cultural background. In India it's interesting to become an electronic engineer because he or she will get a high income; physics – unlike e.g. in Germany and other European countries- is regarded as an aesthetic subject for women. The stage of the technical development of a country has some influence here, too. In agrarian societies e.g. the reputation of engineers is not as good as in highly civilized countries and therefore is not as attractive for men (cf. Knoll & Ratzer, 2010).

In addition to socio-cultural factors there are individual psychological ones, which are important in this context and which the individuals themselves are often not aware of. Thus girls are less motivated to choose a technical occupation because they lack the self-confidence to be successful in technical occupations or studies. These mechanisms shall be examined more carefully now.

## 5. Is there a gender gap in STEM-specific ability, performance and motivational factors?

The first possible reason for the fact that girls and women are less represented in the STEM field is that their ability might be different from men's. The stereotype image of a girl having a talent for language and the boy interested and experienced in mathematics and science clearly dominates our thinking in this context. But if we try to measure the real ability by school achievement, psychological or intelligence tests we cannot completely confirm this idea (Halpern, 2000). According to a meta-analysis by Maccoby and Jacklin (1974) mathematical and spatial abilities are two of four fields in which gender differences in favor of males have been found consistently. Girls and women are normally superior in language competence. But examined more carefully, it is only the "word fluency" measured by so-called anagram tasks that reveal clear advantages for girls. The findings for other language abilities are inconsistent. Of the spatial abilities it is especially mental-rotation tasks that males can commonly do more effectively. But this gender difference is not as great as people normally think either (Quaiser-Pohl & Jordan, 2004/2007). This is supported by the findings of international school-achievement test comparisons like TIMSS (Baumert, Bos, & Lehmann, 2000) and PISA (Prenzel et al., 2007). For mathematics there are some large partly international meta-analyses (e.g. Else-Quest, Hyde, & Linn, 2010), which suggest that in most mathematical domains there are no gender differences or that they cannot be found in all countries.

With regard to the interest of schoolchildren, sciences, especially physics but also chemistry, tend to be boys' domains, whereas biology is already a favourite for girls. This shows also e.g. the choice of high efficiency courses in senior classes of gymnasiums in Germany (vbw, 2009). Even in extremely selected subgroups, e.g. in a mathematic-scientific gymnasium (Lehmann & Jüling, 2010), girls in their senior classes chose German and foreign languages more often than boys, although their own achievement in mathematics and sciences was better than the boys'.

In addition to their interests a number of emotional and motivational factors are important with regard to the choice of subjects especially for girls. Before entering typically male domains, it is especially their ability-related self-concept, which is the self-evaluation of their own ability and the self-efficacy, which highly influences women's decision (e.g. Rustemeyer & Jubel, 1996). According to many studies women have stronger fears of mathematics and a lower mathematical self-concept (Casey, Nuttall, & Pezaris, 1997). US meta-analyses of gender differences in domain-specific



attitudes and emotional assessments reveal that men have more positive attitudes towards mathematics (cf. Hyde, Fennema, Ryan, Frost & Hopp, 1990). All these factors of influence are important not only in mathematics, of course, but also in all the other STEM subjects.

## **6. Approaches to explain the underrepresentation of women**

Schools in their function as institutes of education create gender differences; gender-typical priorities of subjects and interests can be noticed here very early. Children show different interests in science and technics already in elementary schools (Endepohls-Ulpe, Stahl-von Zabern, & Ebach, 2010). When subjects and courses can be chosen or refused, girls prefer foreign languages, arts and music, and gymnastics and dancing for sports lessons. Boys favour maths and sciences, and ball games for sports lessons. With regard to the influence of schools on the development of competence and interest of girls, the advantages and disadvantages of co-education and single-sex education in these subjects have often been discussed. Studies have revealed that girls who attended girls' schools study typical male subjects like physics more often. For single-sex education only in some subjects positive effects were demonstrated, too. The problem, however, is that such methods of separation of the genders or special treatments of girls are seen as positive discrimination, and this is the reason why they are often rejected (cf. Kessels, 2002).

In schools male and female teachers have the function of important role models. But our teachers are allotted to schools gender-typically. Normally teachers of physics are men, almost all teachers at elementary schools are women, but there are only male school heads even at elementary schools. These facts have a great effect on the pupils, because both male and female teachers are important role models for them, when they must choose subjects and their occupations. The self-concepts and achievement of girls are influenced by the negative self-concept and special fears of their female teachers in gender-typical fields. Female pupils of female teachers who are not self-confident in mathematics lessons will more probably agree with the traditional gender stereotype ("boys are clever in mathematics, and girls are good readers") and after only one school year their achievement in this subject is not as good as that of girls, whose female teachers are self-confident in mathematics (Beilock, Gunderson, Ramirez & Levine, 2010).

A lot of studies have revealed that scientific technical school education has an influence on the girls' choice of STEM vocations and university subjects. A comparison of the curricula, educational work and structural con-

ditions, e.g. choice of subjects at secondary schools, in different countries has shown this effect. This is true for single-sex lessons introduced in many countries, the binding of technical subjects into the curriculum, e.g. the poly-technical training in the former GDR (cf. Sander, Quaiser-Pohl, & Stigler, 2010), or of scientific courses into the curriculum of secondary schools in Poland and Italy. 25% of all the girls from all US girls' schools e.g. study a scientific subject at universities or colleges and 58% of the female students of the British Institute of Physics in 1992 had attended girls' schools in Great Britain (cf. Knoll & Ratzer, 2010).

## **7. The influence of gender-role stereotypes**

In any culture or society all men and women are expected to behave in certain ways. Although obviously not all the men and all the women follow the current gender stereotypes, we consistently and mechanically ascribe gender-typical characteristics to them which are created by the gender stereotypes common in our society. We do this even if we realize by self-assessment that we as a man or a woman do not really follow the stereotype ourselves and know a lot of other people who don't, either. Parts of our social image of womanliness are still social, emotional and communicational abilities and attitudes which are in a way contrary to technics and sciences. STEM subjects are rather characterized by rationality, objectivity and abstraction (Schuster, Sülzle, Winker & Wolfram, 2004).

Gender stereotypes influence our behaviour, beginning to do this, when we are still very young. Small children already behave in a gender-typical way, boys playing with toy cars, Lego, construction sets, reading books with topics for boys, about cowboys, knights or football. Girls, however, will play with dolls, like drawing and painting pictures, doing handiwork and reading stories about horses. Parents, educators, peers will sanction against gender-atypical interests and behaviour, not really uncommon if you watch children carefully. Boys e.g. playing with dolls or using nail varnish will be mocked and a girl interested in cars and technics will be less accepted by other girls than another one playing with Barbie dolls. The media have a central part in maintaining gender-role stereotypes in our society.

In this context there is the phenomenon of the "stereotype-threat" – often examined by psychological research. When a task has been announced as a gender-typical one (e.g. "mathematics is easier for boys or men") this will have a negative effect on people of the other sex (cf. Steele, 1997), which is explained by the fact that – in this example – especially girls and women who are good achievers in the field will feel threatened, because they

fear the negative stereotype may be proved by their own performance, too; and this fear will result in worse performance. This could be shown in experimental studies especially for mathematical and spatial tasks (cf. Shih, Pittinsky & Ambady, 1999; Neuburger, Jansen, Heil, & Quaiser-Pohl, 2012). The situation of a “stereotype threat” is often created in classrooms, because teachers have gender-stereotype tendencies, too, expect different results from their girls and boys in different subjects and will directly or indirectly give signals about these expectations to their pupils.

Social-scientific approaches to explain why girls and women are under-represented in the STEM field focus on the negative effect of emphasizing their minority status, polarizing gender stereotypes and visualizing the women in male domains more clearly, who will be constantly watched and evaluated by this. On the other hand women always have to conceal their high competence, being afraid of competition, and so have to bear the conflict of an excellent performance and the demonstration of incompetence at the same time. A single girl or woman is always regarded as a representative of her gender and her individual performance and actions are only taken into account and accepted, if they follow the stereotype of their gender. Thus STEM women have only got the alternative either to obey their gender stereotype and refuse to follow the demands of their occupations or vice versa. Otherwise people will have doubts that they are real women or that they are good enough in their jobs (Horwarth, Kronberger & Wörtl, 2007).

These considerations and findings should be taken into account and included in gender-sensitive teaching settings. In Germany there are already numerous well-established intervention programmes and initiatives (e.g. mentoring programs) in and outside schools, at universities and by business companies that help women to overcome these difficulties, if they plan careers in the STEM field.

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# **To bèta or not to bèta? The role of teachers in the gendered choice of science and technology by secondary school students**

## **1. Introduction**

Only 18% of Dutch students graduating in the exact sciences (beta subjects) are women.<sup>2</sup> There are great differences between boys and girls in the choice of subjects, study and career. European statistics reveal that in the Netherlands these differences are greater than in most EU countries. (She Figures, 2009). Since a shortage of technologists with tertiary education is expected, this is an undesirable situation. (Van Langen & Vierke, 2009). The question is, at which moment in the school career this gender-gap originates and what factors are of influence. Do teachers play a part? Various researchers have tried to chart this. Ayalon (2003) found out that the basis of gender segregation in higher education was to be detected in the choice of subjects at secondary school. The large-scale quantitative research in the Netherlands of Van Langen and Vierke in 2009 examined the choice of examination options that include the exact sciences. The degree of pupils' self-efficacy and the perceived use and enjoyment of exact sciences appeared to be related to the choice of these subjects. However, they found out no direct connection between the choice of secondary school students for the science and technology option and the influence of teacher characteristics such as age, efforts to make their subject more attractive and/or attitude to pupils.

In our research we had a look at possible indirect influences of teachers on the boys' and girls' choice for science and technology. Teachers are important 'socializers,' probably playing a role in this choice and influencing the self-efficacy and attitude of students with regard to science subjects.

In order to acquire greater insight into explanations for the difference between boys and girls in their choice of science subjects, 149 secondary school students completed a questionnaire about physics and chemistry.

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2 The number of women choosing a technological study at university is 17%, this is 50% less than in other European /OECD countries (OECD, 2005; see also Schippers 2011).

The questionnaire contained items relating to the intended subject choices of students, their feelings about proficiency in physics and chemistry (self-efficacy) and the perceived use, enjoyment and interest in these subjects (attitude). We have analysed the relationship between self-efficacy, attitude and the choice of physics and chemistry. In addition, we have examined self-efficacy and attitude in respect of exact sciences by interviewing a group of secondary school students. What is the difference in attitude and self-efficacy between boys and girls in respect of exact sciences? Which factors do the students themselves consider to influence their choice? What was the role of the teacher in these choices?

In order to answer these questions the earlier findings on students' opinions of exact sciences and the possible role of teachers will be considered first. This will be followed by a short description of our methodology, the results of the questionnaire and the analysed interviews and finally a number of conclusions will be drawn.

## **2. The impact of gender stereotypes in the educational system**

### **2.1 Self-efficacy & attitude**

In our present western society, and certainly in the Netherlands, technology has strong masculine connotations, which can have a negative influence on girls' choice of the exact sciences (Wajcman, 2004; Rommes, Overbeek, Scholte, Engels & De Kemp, 2007). The choice of an examination package is taken during adolescence, at the time when it is important to conform to 'gender authenticity' (Faulkner, 2009). Conformity to social norms, and gender norms in particular, are important during this period especially because (hetero)sexuality comes to the fore (Lobel, Nov-Krispin, Schiller, Lobel & Feldman, 2004; Rommes, 2010). Various research has shown that adolescent girls with 'masculine' interests, skills and career choices are regarded as less attractive (Brownlow, Smith & Ellis, 2002; Badgett & Lee, 2003; Kessels, 2005). The masculine connotation of the exact sciences can therefore have direct consequences for the girls' choice of these subjects.

The masculine connotation of the exact sciences can also have an indirect influence on the students' choice of subjects through their experience of competence and enjoyment in certain subjects and the results achieved in these subjects. Spencer, Steele and Quinn (1999) demonstrated by a mathematics experiment that boys did indeed better than girls when participants were told that boys were better at a certain subject. When the participants



were told that boys and girls did equally well, no differences could be found out in their results. It appears that gender-stereotypical expectations in respect to mathematics influence self-efficacy. The fact that others thought that boys were better at mathematics created anxiety amongst girls, causing them to do less well, the well-known ‘stereotype threat’ (Schmader, Johns & Barquissau, 2004). Nosek, Banaji, and Greenwald (2002) showed that, even when girls explicitly rejected the idea that boys are better at mathematics, the stereotype still had an effect.

The self-efficacy in exact sciences differs between boys and girls. Corell (2001) demonstrated that when men and women had the same scores in mathematics tests, men still felt more competent in the subject. This caused men to pursue more activities that led to a career in technology. More men practiced such activities because they thought they were more competent than women, although this was not the case. Dickhäuser and Steinsmeier-Pelster (2003) had similar findings for computer courses.

## **2.2 Teachers**

When students do not feel competent in exact sciences, they are less likely to choose this direction [for their further education] (Van Langen & Vierke, 2009; Jones & Smart, 1995). To what extent do teachers influence these gendered choices and images? In recent large-scale research (Van Langen & Vierke, 2009) it appeared that teacher variables such as sex, teaching experience, opinions on technology, general male/female attitude and didactic approach had little to do with the degree to which students choose the exact science option. The researchers assume a neutralizing effect: a mathematics teacher, for example, could be motivating so that more girls choose exact sciences, but at the same time a physics teacher could have the opposite effect. A possible result is that the teacher factor is not visible with their methods. In addition, it appears that the teachers’ advice to students is also important for the choice of direction and it appears that girls got different advice than boys with the same results. Van Langen and Vierke (*ibid.*) found out that teachers advised girls more often with good marks for exact sciences to choose the science and health option and advised against the science and technology, which is the option aimed chiefly at higher education in the exact sciences, than they did boys with the same marks. The given advice was then not only based on the pupils’ results, but also appeared that teachers have different expectations of future careers for boys and girls.

Teachers can also affect students by influencing their self-efficacy in exact sciences. In recent research among 301 secondary school students it

appeared that the expectations of teachers of their results, as perceived by students, chiefly influenced the self-efficacy of girls in their own computer skills (Vekiri, 2009). Kahle et al. (1993) showed that the differing expectations that teachers have of boys and girls in exact sciences can lead to a difference in treatment. Teachers approach – sometimes unconsciously – girls differently with questions and feedback than boys, which leads to differing learning possibilities. The self-efficacy of boys and girls can be also influenced in other ways. Younger, Warrington and Williams (1999) and Leinhardt, Seewald and Engel (1997) discovered that it was students' experience that teachers paid more negative attention to boys. Furthermore, the teacher-student interaction was in general dominated by boys, who got more questions and more rebukes.

Finally, both Lee (2002) and Krogh and Thomson (2005) emphasized the importance of a friendly approach by teachers to students. Even the furnishing of the classroom by the teacher can influence girls in feeling that technology can be interesting for them, too. (Cheryan, Meltzoff & Kim, 2011; see also Murphy & Whitlegg, 2006; Lagesen, 2003). According to Jones and Smart (1995) the pedagogical style (informal, collaborative and enthusiastic), positive feedback and attitude of teachers towards girls influence girls' mathematics self-efficacy. Teachers play an important role in the attitude and achievements of students in physics, particularly by certain instruction strategies and social behaviour (Labudde, 2000).

Teachers can affect the subject choice of secondary school students in various ways. Their advice differs for boys and girls and has an influence. In the classroom, teachers sometimes behave differently towards girls than boys, which can affect the attitudes and self-efficacy of students in regard to exact sciences. Finally, the social behaviour of teachers in class – do they give girls the idea that technology is also suitable for them – can affect whether girls choose science or not.

### **3. Method**

In this examination use was made of a combination of quantitative and qualitative methods, using both questionnaires and interviews. The questionnaires on physics and chemistry were filled in by 149 third-year students of a secondary school in Nijmegen, The Netherlands. The group consisted of 77 boys and 72 girls aged between 14 and 16 years. The questionnaire dealt with the students' opinions of physics and chemistry and their present/current teachers in these subjects. The items used for this research can be found in appendix A.

### 3.1 Quantitative research

With the help of Mplus (Muthén & Muthén, 2007) a confirmative factor analysis was carried out for items 1-9 of the questionnaire. On the basis of this the following scales can be determined: physics attitude, chemistry attitude, physics self-efficacy and chemistry self-efficacy (tables 1 and 2). A *goodness of fit* test was carried out for both questionnaires.<sup>3</sup> The *comparative fit index* was good for both chemistry<sup>4</sup> and physics. The reliability of all scales was good.<sup>5</sup>

Table 1: Factor Loading of Physics Attitude and Physics Self-efficacy

Item	Factor 1 Physics Attitude	Factor 2 Physics Self-efficacy
1		.93
2	.84	
3	.75	
4	.79	
5		-.76
7		.80
9		.68

Table 2: Factor Loading of Chemistry Attitude and Chemistry Self-efficacy

Item	Factor 1 Chemistry Attitude	Factor 2 Chemistry Self-efficacy
1		.89
2	.89	
3	.74	
4	.87	
5		.80
7		.75
9		.68

3 The factors appeared to be good for physics ( $\chi^2(11) = 12.97, p = .30$  and satisfactory for chemistry ( $\chi^2(12) = 20.71, p = .05$ ).

4 Resp. CFI = 0.99 and CFI = 1.00

5 Cronbach's alpha was .85 for the 'attitude to physics', .89 for 'physics self-efficacy', .87 for 'attitude to chemistry' and also .87 for 'chemistry self-efficacy'.

### 3.2 Qualitative research

18 interviews were conducted; these were developed for the ‘Motivation Project’, a European project that aimed to chart the factors of importance in students’ choice of exact sciences (Sagebiel et al., 2009). The student participants were also aged between 14 and 16 years and followed secondary education in various places in the Netherlands. They were at the point at which they had to choose their examination option: science & technology, science & health, economy & society or culture & society. The interviews consisted of questions about the image of science and technology and factors that could influence this image. An example of a question is ‘Can you tell me something about your physics teacher?’ The interviews were recorded and later written up *verbatim*. They were coded for male and female, followed by the student’s number. In our analysis special attention was paid to remarks about exact sciences and their opinions of them.

In order to answer the first research question – whether there are differences between boys and girls in their choice of physics and chemistry – descriptive statistics and cross-tables were created with SPSS. As the choice of physics and chemistry are nominal variables with two categories, the relationship between physics/chemistry self-efficacy and physics/chemistry attitude has been analysed by a logical regression procedure. Items 8 and 13 could not be included in the scales, but were informative for the research. The relations between these items and self-efficacy and attitude in regard to physics and chemistry have been analysed by a calculation of the correlations.

## 4. Differences between boys and girls?

We will first describe the differences between boys and girls in their choice of physics and chemistry. The differences with respect to self-efficacy and attitude in regard to exact sciences are analysed on the basis of both questionnaires and interviews. In the next step, the relationship between self-efficacy and attitude in respect of exact sciences and the choice of these subjects will be examined. Finally, we will describe ways in which teachers can influence self-efficacy and attitude in regard to exact sciences and the choice for these, again based on both questionnaires and interviews.

## 4.1 Self-efficacy and attitude

The results of the questionnaire show that 84% of the boys and 68% of the girls chose to carry on with physics. This difference was significant for physics ( $\chi^2 (1) = 5.54$ ,  $p = 0.02$ ), but not for chemistry ( $\chi^2 (1) = 2.62$ ,  $p = 0.11$ ), where 85% of the boys and 75% of the girls chose to continue the course

There were significant differences between boys and girls in their physics/chemistry self-efficacy and attitude (table 3). Boys were more positive about physics and chemistry and apparently had more confidence in their capacities.

Table 3: Averages (Standard Deviations) and T-values for Self-efficacy and Attitude

	Boys (n = 77)	Girls (n = 72)	T-value
Physics Self-efficacy	2.75 (0.68)	2.07 (0.64)	6.30***
Physics Attitude	2.99 (0.68)	2.55 (0.72)	3.84***
Chemistry Self-efficacy	2.84 (0.65)	2.46 (0.55)	3.83***
Chemistry Attitude	3.12 (0.73)	2.88 (0.69)	2.01*

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

In the interviews it appeared, too, that girls doubted their capacity more often than boys. Girls said you had to be very clever to be good at exact sciences and that those were very difficult subjects ('Physics, I just don't get it' F14). Whenever a girl described someone who has worked in science and technology, she would use phrases such as: 'just people who are really clever ... and mostly men'(F16). In case the girls had good marks in science they said they have worked hard or the test was relatively easy. Respondent 17, for example, said:

*'I'm not bad at it, but not really good (researcher pointed out her high marks for physics) ... yes but the teacher gives very easy tests and exams.'* (F17)

This shows that these girls thought that their results were not due to their own capacities, but to hard work or external factors. In contrast, boys were generally positive about their own capacities. When they were asked, whether they were good at science subjects they often answered 'yes' (for example M2) or 'yes, I am pretty good' (M1).

At the same time it appeared from the interviews that there were differences between boys and girls in their attitude towards exact sciences.

Boys' answers indicated a positive attitude towards science subjects, describing them, for example as 'interesting'. Girls seemed more ambivalent towards these subjects, their answers sometimes containing contradictions. For example, when a girl was asked whether she saw herself as someone interested in science and technology, she said no. However, when she was asked which school subjects she enjoyed, she said technology (F9). Probably it was difficult for this girl to bring together a subject she enjoys (technology) with the image of someone who likes exact sciences.

The girls principally seemed to aim at a 'social' image. For instance one girl said: 'I don't see myself doing technology, I'm more of a people person'(F4). When girls talked about their interests or future career they often said that they wanted to help people ('actually I'd like to be a doctor or something like that so you can help people' F16). The girls seemed to think that 'helping people' and exact sciences were two different things that could not be combined. Even girls who were interested in science and technology, did not consider further education in this field, because they wanted to work 'with people' in their future (F15). Respondent 2 gave an answer that is typical of many girls:

*'The subjects, the whole field doesn't really attract me. Just sitting alone behind a computer or alone in a lab. You haven't any contact with people.'*(F2)

Another girl said that she knew it was probably an inaccurate image, but she thought the people who worked in ICT were in general not such nice people. (F1).

In short, both the questionnaires and the interviews demonstrated that there are differences between boys and girls in the self-efficacy and attitude towards science subjects. Generally speaking, boys were more positive about the exact sciences than the girls. Girls doubted their capacities more often. It was difficult for girls to see science combined with what they appeared to consider important – being sociable and working with people.

## **4.2 Self-efficacy, attitude and the choice of physics**

As we saw above, only the difference between boys and girls in the choice of physics is significant. It would seem that the exact sciences cannot be seen as a unit. In the following analysis we will look at the relationship between the choice of physics and self-efficacy and attitude towards the subject.

Table 4: Logistic Regression Analysis of Choice of Physics (N=149)

Variable	B	SE B	Chance Ratio
Unit 1			
Physics Self-efficacy	2.56	0.48	12.90*
Unit 2			
Physics Self-efficacy	2.09	0.57	8.12*
Physics attitude	2.35	0.51	10.51*

\*  $p < .05$

A great deal of confidence in their capacity in and a positive attitude towards physics goes along with a choice for the subject. When self-efficacy and attitude were added to the model the predictive value of the model increased.<sup>6</sup>

### 4.3 Teachers

The role that teachers can play in the self-efficacy and attitude of students in regard to exact sciences and choosing these subjects was considered in a second step. Two items in the questionnaire, the advice of teachers and the attention of the teacher as experienced by the students, were considered in relation to self-efficacy and attitude towards physics and chemistry. Teacher characteristics that were considered to be important by students are also discussed.

The cross table shows that the teachers' advice to students to continue with physics is significantly related to their choice of the subject, both for boys ( $\chi^2(4) = 16.88, p = .00$ ) and girls ( $\chi^2(4) = 15.18, p = .00$ ).

The teachers' advice to students, both boys and girls, was related significantly to their self-efficacy in physics and chemistry. For girls the teachers' advice was also related to the attitude towards physics.

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<sup>6</sup> Nagelkerke  $R^2$  was .65. The correctly predicted percentage of students choosing physics increased by 11.1%.

Table 5: Relationship Teachers' Advice with Attitude and Self-efficacy

	Teachers' advice to continue with the subject (physics/chemistry)	
	Boys	Girls
Physics attitude	.20	.39**
Physics Self-efficacy	.76**	.74**
Chemistry attitude	.18	.08
Chemistry Self-efficacy	.45**	.42**

\* p &lt; .05

\*\* p &lt; .01

A cross table for teacher attention experienced by boys and girls and the choice for continuing with physics showed that this relation was neither significant for boys ( $\chi^2(3) = 1.03$ ,  $p = .79$ ) nor girls ( $\chi^2(3) = 0.93$ ,  $p = .82$ ). There was indeed a relation between the degree to which girls said they experienced attention from the teacher and their choice of chemistry ( $\chi^2(3) = 9.39$ ,  $p = .02$ ). This correlation was not detected for boys. When the physics/chemistry attitude and self-efficacy is considered in relation to the amount of teacher attention experienced, it appears that there is a difference between boys and girls. The amount of attention that girls have experienced by their physics teacher had a positive relation to their attitude towards the subject and their self-efficacy.

Table 6: Relationship of Perception of Attention from teacher to Attitude and Self-efficacy

	Student perception of degree of attention from teacher	
	Boys	Girls
Physics attitude	.17	.43**
Physics Self-efficacy	.14	.25*
Chemistry attitude	-.19	.13
Chemistry Self-efficacy	-.11	.02

\* p &lt; .05

\*\* p &lt; .01

In the interviews the students could express in their own words what they liked or disliked about their teachers. What did students consider as important teacher characteristics? Students spoke chiefly about the didactic skills of their teachers. When a student was asked what made a good teacher, 'the ability to explain well' was usually the first skill they mentioned. One boy was asked what teaching style he liked most and he answered:



*'Someone is very clear and the other one is chaotic. Last year, and for a few years before that, I had the same person who was pretty chaotic. I thought he was simply a bad teacher, but now I have someone whose lessons are much clearer and that is great.'* (M3)

Another boy felt that his teacher was not capable of thinking at an abstract level (M6). Yet another boy speaking about science and technology teachers said:

*'Yes, generally speaking very good. Apart from physics, he doesn't approach it well, can't explain properly. He doesn't bring any variety to it.'* (M5).

Another example is a girl who did not like physics and said about her physics teacher:

*'He tries to explain, but can't do it properly, perhaps he knows what he is talking about ... but he can't explain it well to other people.'* (F16)

Girls often said that the teacher influenced their attitude towards the subject (*'If a teacher is positive about it, I see it in a more positive way'*, F9). For instance, a good example meant that they enjoyed the subject more (F16). One girl praised her biology teacher who gave good examples, bringing interesting articles to the class. The girl said: *'if you know what it is useful for or if it has some use, then you are closer to everyday life'* (F1).

Another quality of teachers that was frequently mentioned was enthusiasm. Students liked enthusiastic teachers and said that they were then more enthusiastic themselves about the subject. Examples of such comments are: *'if someone is enthusiastic about their own subject then you pay more attention automatically'* (F16) and *'if a teacher is motivated it is just more interesting.'* (F1). Enthusiasm then appears to be contagious, but unfortunately the students seldom found this in their own teachers.

## **5. Conclusion: Towards more equality?**

The main question of this research was, in which ways teachers can influence the self-efficacy and attitude towards exact sciences and the choice of these subjects taken by boys and girls. First, the differences between boys and girls in their choice of physics and chemistry were examined. Boys chose physics significantly more often than girls, but in the school in which our study was carried out, this was not, or no longer, the case with chemistry. Hyde, Lindberg, Linn, Ellis and Williams (2008) have shown that the differences between boys and girls in mathematics have disappeared in recent years. Is chemistry on the road to having less masculine connotations than physics? In any case the exact sciences cannot be seen as a single unit,

as it was done in various research projects that were dealt with in the literature. Campaigns that endeavour to promote the choice of exact sciences should differentiate more between the subjects.

Nevertheless, this research has shown interesting findings about exact sciences in general. The results of the two groups that were both qualitatively and quantitatively investigated, point in the same direction. Both the questionnaires and the interviews demonstrated that there were differences between boys and girls in their self-efficacy in exact sciences. Girls had less self-efficacy in these subjects. Gender-related stereotypes seemed to be present, which is not surprising considering the great difference between boys and girls in their choice of exact sciences, compared to other countries (Guiso, Monte, Sapienza, & Zingales, 2008). This can lead to the stereotype threat (see introduction) and the resulting lack of the girls' choice of exact sciences.<sup>7</sup>

Both the interviews and questionnaires showed that the attitude of girls towards exact sciences was less positive than that of boys. The interviews showed that girls primarily expressed they had difficulties with exact sciences and the related work area because they found it difficult to combine these with being sociable and working with people to which they appeared to attach a great deal of importance. The question remains to what extent the exact sciences and the associated careers are less considered to be social than many careers with a female connotation. Furthermore, it would be interesting to explore, to what extent girls really are interested in 'working with people', and whether it is possible that all those assumptions contribute to the fact that girls are less positive about exact sciences than boys. In addition, a woman with a positive attitude towards chemistry is judged less attractive than a woman, who wants to work with people (see introduction). Girls could be afraid that a positive attitude towards exact sciences would make them less pleasing and less physically attractive.

According to Kessels, Rau and Hannover (2006), girls' attitude towards physics could be changed. In their experiment, when students were confronted with other lesson material that challenged the dominant masculine image, their implicit associations with physics underwent a significant change. The construction and use of such material should be a challenge for those involved in teaching exact sciences.

What part can teachers play? In the literature section it appeared that the degree to which teachers paid attention to boys and girls was an example of behaviour that can have an influence on students. The present research

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7 Ironically enough an article such as this can strengthen the stereotypes about women in exact sciences even though this is contrary to the intention.

seems to confirm this. The girls' perception of the degree of teacher attention they have received had a significant relation to the attitude and self-efficacy in respect of physics. The advice to students given by the teacher to continue with a subject was connected to the self-efficacy in physics and chemistry and the attitude towards physics. In addition, boys as well as girls felt that the ability to explain well and being enthusiastic were important. Unfortunately, the students did not judge their own teachers to be enthusiastic.

It appeared, particularly from the qualitative part of this study, that teachers can be important for the attitude and self-efficacy of boys and girls. In the school, where this research was carried out, self-efficacy and attitude in physics seemed to be connected to the choice of physics as a subject. From this we can conclude that although teacher variables have no influence on gender differences in the choice of exact sciences, they do have an indirect effect by way of self-efficacy and attitude in respect of these subjects (cf: Van Langen & Vierke, 2009). Self-efficacy and attitude in respect of physics and chemistry have already been lower in the case of the girls. In addition, the perceived teacher attention in physics was more closely related to self-efficacy and attitude towards the subject by girls than by boys.

A remedy for the gender-gap in exact sciences is obvious: teachers must pay more attention to girls, hoping that this can change their perception of attention received. Good explanations that appeal to girls and showing enthusiasm for the subject are equally relevant, and pointing out the 'helping people' aspects of the exact sciences seems to be of particular importance. The masculine connotations of technology and the differences in teachers' approach to girls and boys noted in literature may give girls the impression that technology is not relevant for them. This has a negative influence on their self-efficacy. These social tendencies can be partially compensated by giving more positive feed-back, particularly to girls.

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## Appendix A

*The questions used in this research about physics; the same questions were posed about chemistry*

To what extent do you agree with the statements below?

	totally disagree		totally agree	
1. I think physics is an easy subject.	1	2	3	4
2. I enjoy physics.	1	2	3	4
3. I think physics is a useful subject.	1	2	3	4
4. I think physics is an interesting subject.	1	2	3	4
5. I have to work hard for physics.	1	2	3	4
7. I think I am good at physics.	1	2	3	4
8. I get plenty of attention from the physics teacher.	1	2	3	4
9. The teacher thinks I am good at physics.	1	2	3	4
13. What advice have you received from your physics teacher? ....				
1 means: It would be unwise to choose this subject				
2 means: Think over your choice: the subject will need a lot of effort from you.				
3 means: You can do this subject, but it might be difficult				
4 means: You can do this subject really well				
5 means: This is your subject. You must choose it.				
15. Have you chosen physics?	0 yes		0 no	

## **Barriers and motivational factors for taking up a career in a technological field in Germany and Austria**

### **1. Introduction**

Looking at gender differences in educational and occupational systems of current European societies, one issue of concern in almost all European countries is the fact that women and girls are considerably underrepresented in science and technological education, areas and jobs (EURYDICE/EA-CEA, 2010). There is a frequently claimed horizontal segregation – gender specific choices of different areas of apprenticeships and studies. In spite of the fact that gender differences in attainment of female and male students in mathematics and science are getting smaller (Bos, Lankes, Prenzel, Schwippert, Walther & Valtin, 2008; Klieme et al., 2010; see also Gila, 2001), as revealed by international surveys, girls and women still avoid the field of STEM (Science, Technology, Engineering and Mathematics), a behavior which also leads to lower incomes and insecure positions for women.

This situation is not only discussed in terms of gender inequalities. Apparently, most European countries have difficulties to provide a sufficient number of work staff in technical and scientific fields. Especially in the field of engineering a lack of qualified personnel is claimed. Hence there is a great interest to encourage both men and women for taking up apprenticeships and studies in the field of STEM, especially in tertiary education.

The study presented was part of a European research project (UPDATE) that aimed at improving science and technology teaching in Europe, especially for girls. UPDATE stands for: Understanding and Providing a Developmental Approach to Technology Education.<sup>1</sup> Objective of the study amongst others was to develop innovative pedagogical practices and learning environments which encourage girls and young women to choose courses of study and professions in the field of natural science and technology. This was done in the eleven participating countries. A first step in this process was to explore barriers and motivating factors for girls to take up courses of study from science and technology.

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1 UPDATE was part of the 6th framework programme of the European Union, period of sponsorship 2007-2009

## **2. Explanations for gender differences in occupational choices**

In the last decades a lot of empirical research has been done in order to find an answer to the question of the possible causes of gender differences in occupational choices. In spite of the great effort to prove that innate gender differences in spatial or verbal abilities play a role in this field, the part that biological gender differences might have, is still not clear (Beermann, Heller & Menacher, 1992; Quaiser-Pohl & Jordan, 2004). Instead, environmental variables have been put into the focus of attention and in equal measure individuals' own cognitive activity to construct his or her identity as a female or male (Hannover, 2004).

A well-known model for the explanation of gender differences concerning occupational and educational choices was presented by Eccles (1985; 1994). This model points out that decisions concerning apprenticeships or careers are based on a complex network of variables. A person's abilities or skills are only one variable amongst others. Some of the factors which Eccles and her colleagues identified as influencing for achievement-related behaviour and occupational choices are: a person's expectations of success, his or her sense of personal efficacy, the subjective value attached to each option available, gender roles and other identity-related variables (Deaux & Lafrance, 1998). The choices that men and women make are influenced by a calculation of the fit between a particular option and a person's basic goals, motivations and self-definitions, as well as by the balance between the attainment value and the perceived costs of this option. Gender stereotypes in general as well as stereotype views of certain professions also play an important role in this process.

Of course, institutional framework conditions of the educational process such as school systems, curricula and the process of instruction itself influence several variables of this network.

## **3. Educational system and technology education in Germany and Austria**

Germany and Austria are two German speaking countries in central Europe with similar educational systems (e.g. tracking system after four years of primary school), who participated in the UPDATE project. Nevertheless, there are differences with respect to technology education in primary and secondary schools between those two countries.



In Germany, as a consequence of the educational federalism, which means that educational legislation and administration of the educational system are primarily under responsibility of the 16 federal states, there are different curricula for each federal state and in each state for each type of school and each subject, which makes it difficult to come to general statements about technology education.

An analysis of a sample of written curricula for primary schools (Endepohls-Ulpe, Stahl-von Zabern & Ebach, 2010) shows that in general it can be stated that technology education in German primary schools takes place as a part of the subject “Sachkunde“. There is no self-contained subject „technology“. Technology education for boys and girls mainly takes place within the subject “Sachunterricht“ – social studies – , which means that scientific and technology topics are included in cooperative or integrative learning fields of this subject. Therefore, curricula for “Sachkunde“ refer contentwise – amongst others – to technology education. As technology is not a self-contained subject and teachers in primary schools have a lot of pedagogical freedom, they tend to avoid topics from this field (ibidem). This problem is even tightened by the fact that technology education is not necessarily part of primary school teacher education at many universities. Besides, teachers at primary schools are mostly female and do not feel very competent with respect to technology themes, which also makes them avoid these topics.

In secondary schools technical contents are being taught differently, depending on the type of school, specialization and federal state. Technology as a self-contained subject does not exist at every school. According to Schmayl (1995, pp. 113 ff) at intermediate schools and grammar schools technology education is being neglected compared to secondary general and comprehensive schools. Technology education and work theory are mainly geared towards pupils of secondary general schools, as they are the ones who have to find their way through the industry society and have to integrate themselves into the process of waged work quite early. Since economy and technology education are of equal importance to pupils of intermediate and grammar schools, a more serious consideration of technical contents in classes and in the list of subjects at these schools has been demanded.

In Austrian primary schools technology education is a self-contained subject and takes place in the subject “Technisches Werken” (crafts and technology) which is also compulsory for boys and girls. In 2007, the content of this subject was adjusted and modernized (Seiter, 2009). In lower secondary “crafts and technology” and “textile crafts” are compulsory optional subjects and students have to opt for one of the two. In upper secondary, technology is only an optional subject (Seiter, 2009).

Thus it seems that in Austria at least for younger students – boys as well as girls – the chances to get in contact with technological themes and develop interests and competences in this field are good. However, in Austria just like in Germany many teachers in primary school seem to have problems with technology education. There are different types of teachers with different levels of education with respect to technology teaching (Jacob, Gschwandtner & Mischak, 2007; c.f. Kaul, 2011). A great part of them does not feel able to cope with the requirements of the curriculum and – mostly females – do not estimate their own technological competencies to be sufficient enough.

A second problem in Austria is that in secondary school, when students have to opt for one of the two subjects “crafts and technology” and “textile craft”, students make their choice mostly according to the traditional gender stereotypes. Thus girls are dramatically underrepresented in “crafts and technology” (see Kaul, 2011) in the first years of secondary school.

## **4. Objective and conception of the study**

### **4.1 Objective**

As one of the UPDATE projects’ aims was to develop innovative pedagogical practices and learning environments which encourage girls and young women to choose courses of study and professions in the field of natural science and technology, one starting point of the study was to search for biographical incidents or circumstances that young women, who had already taken up courses of study in a technological field, remembered as encouraging or discouraging for their choice.

A second starting point was to search for education related variables in which these students differ from students in non-technological studies. Thus differences between national subsamples can give information about the effects of different ways of presenting technology as a subject at school.

### **4.2 Measuring instrument**

As instruments for data collection two questionnaires were constructed according to the two target groups (engineering students / non-engineering students). The two questionnaires based in parts on the questionnaire developed in the Womeng-Study, German version (Pourrat, 2005), and a questionnaire

provided by the UPDATE – WP 5 leader, Doina Balahur, Alexandru Ioan Cuza University of Iasi.

The questionnaire contained amongst others subscales concerning the following aspects:

- Experiences with technology in:
  - Primary school education
  - Middle and secondary education
- Self-image
- Self-assessed technical competences (currently as a student)
- Attitude towards science and technology
- Occupational image of an engineer
- Ideal characteristics for working in an engineering occupation
- Career expectations

Each subscale consisted of a number of four-step Likert-items, where the respondents could mark the degree of their acceptance of a given statement.

### **4.3 Statistical analysis**

The subscales of the questionnaire were each subjected to a factor analysis – Principal Component Analysis followed by Varimax Rotation. The reliability of the scales constituted by the factors was tested by Item-analysis (Cronbach's  $\alpha$ ).

Analysis of Variance (ANOVA), with gender, course of study, and nationality as fixed factors and values on the dimensions of the subscales of the questionnaire as dependent variables was used to look for differences between female and male students, engineering and non-engineering students and students from Germany and Austria.

## **5. Results**

### **5.1 Sample**

The German subsample consisted of 179 non-engineering students (49 male and 130 female; teacher students and students of pedagogy from the University of Koblenz-Landau) and 141 engineering students (79 male and 62 female; students from several universities of applied sciences in Rhineland-Palatinate, federal state of Germany). Students' age differed between 19 and 48 years ( $M=23.39$ ).

The Austrian sample consisted of 88 non-engineering students (7 male, 81 female; students from the University of Education Vienna and the University for Agricultural and Environmental Pedagogy Vienna) and 100 engineering students (50 male, 50 female; students from the University of Technology Graz), aged 18 to 43 years ( $M=22.43$ ).

## 5.2 Primary school

Items on this scale constituted four factors:

Factor I: Intellectually based interest and high self- efficacy in science and technology (6 items;  $\alpha=.895$ )

Factor II: “Practically based interest in science and technology” (4 items,  $\alpha=.792$ )

Factor III: “Support by mother” (2 items,  $\alpha=.551$ )

Factor IV: “Support by father” (2 items,  $\alpha=.550$ )

With respect to factor I two main effects appeared: male as well as female engineering students remembered themselves as more interested and more competent in science and technology than non-engineering students did ( $F(1, 491) = 30.09$ ;  $p<.001$ ). Males in general assessed themselves better than females ( $F(1, 491) = 13.75$ ;  $p<.001$ ). Furthermore, there was a tendency for an interaction effect between gender and field of study ( $F(1, 491) = 3,82$ ;  $p=.051$ ): male non-engineering students assessed themselves as more interested and competent as female non-engineering students whereas the difference between male and female engineering students was not that high. However, as the subsample of male non engineering students was very small ( $n=7$ ) compared with the subsample of female engineering students ( $n=81$ ), all results concerning gender differences in the sample of Austrian non-engineering students should be interpreted with caution.

For factor II “Practically based interest in science and technology” there were also significant effects for sex and field of study: Male students showed higher values than female students ( $F(1, 491) = 65,41$ ;  $p<.001$ ) and engineering-students higher values than non-engineering students ( $F(1, 491) = 14,96$ ;  $p<.001$ ).

Values for support of the mother with respect to learning science and technology were generally low ( $M=1.5^2$ ;  $SD=.66$ ).

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2 Values on the factors differed between 1 and 4. High values stand for higher levels of the named feature.

The amount of support of the father in the fields of science, technology and IT the students remembered was higher than that of the mother ( $M=2.06$ ;  $SD=.86$ ). Austrian and German engineering students remembered more support from their fathers than non-engineering students did ( $F(1, 491) = 4.47$ ;  $p<.05$ ), especially Austrian non-engineering students remembered low support from their fathers ( $F(1, 491) = 3.13$ ;  $p=.077$ ). German students generally remembered more support from their fathers than Austrian students ( $F(1, 491) = 4.01$ ;  $p<.05$ ).

### **5.3 Middle and secondary education**

The factor analysis of this part of the questionnaire yielded two factors: Factor I: “Teachers impart importance of technology” (3 items;  $\alpha = .769$ ) Factor II: “Support from teachers and parents in learning mathematics and science” (4 items;  $\alpha=.664$ )

With respect to the teachers’ role in imparting the importance of technology there was a significant main effect regarding nationality: Austrian students remembered their teachers as more important in this field than German students did ( $F(1, 496) = 6.66$ ;  $p<.01$ ). There was a tendency for male students to report higher influence of their teachers than females students ( $F(1, 496) = 3.46$ ;  $p=.063$ ). On factor II “Support from teachers and parents in mathematics and science” there was a significant main effect regarding the field of study: Engineering students reported more support than non-engineering students ( $F(1, 497) = 9.44$ ;  $p<.05$ ). Besides, a significant interaction effect “field of study by nationality” could be stated: Austrian engineering students reported significantly more support than Austrian non-engineering students whereas the values of German engineering and non- engineering students did not differ significantly ( $F(1, 497) = 4.70$ ;  $p<.05$ ).

### **5.4 Self-image**

Students were asked to assess the level of some characteristics of their personality. Factor analysis of this part of the questionnaire yielded five factors: Factor I: “Private life and social competencies” (6 items,  $\alpha=.723$ ) Factor II: “Cognitive abilities” (5 items,  $\alpha=.70$ ) Factor III: “Technical abilities” (2 items,  $\alpha=.758$ ) Factor IV: “Creativity” (2 items,  $\alpha=.666$ ) Factor V: “Commitment” (2 items,  $\alpha=.674$ )

With respect to factor I no significant differences between the different groups of students could be stated. In general, students assessed their social competencies and the quality of their private lives to be rather good ( $M=3.28$ ,  $SD=.46$ ).

Concerning self-assessment of cognitive abilities two significant main effects appeared. Engineering students rated their own cognitive abilities to be higher than non-engineering students ( $F(1, 491) = 6.30$ ;  $p<.05$ ) and male students in general assessed their own cognitive abilities better than female students ( $F(1, 491) = 6.01$ ;  $p<.05$ ).

Regarding technical competencies two highly significant main effects were detected. Engineering students assessed their own technical competencies higher than non-engineering students ( $F(1, 489) = 22.42$ ;  $p<.001$ ) and male students saw themselves as more competent than female students did ( $F(1, 489) = 14.79$ ;  $p<.001$ ). A significant interaction effect “field of study by nationality” could be stated. German engineering students showed higher values for self-assessed technical competencies than Austrian engineering students whereas German and Austrian non-engineering students did not differ significantly ( $F(1, 498) = 6.66$ ;  $p<.05$ ).

With respect to self-assessed creativity no group differences could be found. Students mostly stated their own creativity to be high ( $M=2.98$ ,  $SD=.67$ ).

As to Factor V “commitment” a significant main effect of sex could be stated. Female students reported themselves to be more ambitious and diligent than their male colleagues ( $F(1, 491) = 10.69$ ;  $p<.01$ ).

## **5.5 Self-assessed technical competencies**

In this part of the questionnaire three factors could be defined:

Factor I: “Practical know-how in technology” (7 items,  $\alpha=.877$ )

Factor II: “ICT-competencies” (5 items,  $\alpha=.864$ )

Factor III: “Comprehension of technology” (2 items,  $\alpha=.663$ )

With respect to self-assessed practical know-how there was a significant main effect for the field of study ( $F(1, 494) = 39.67$ ;  $p<.001$ ). Engineering students assessed their practical know-how concerning technology higher than non-engineering students. Besides, a significant main effect for sex could be detected. Males describe their own practical know-how better than females ( $F(1, 494) = 33.80$ ;  $p<.001$ ). Male non-engineering students rated their own practical know-how nearly as high as female engineering students did.

Concerning ICT-competencies three significant main effects appeared. Engineering students assessed their own ICT-competencies to be higher than non-engineering students ( $F(1, 493) = 26.06, p < .001$ ), females students ( $M=2.51$ ) rated their own competencies lower than male students ( $F(1, 493) = 64.49; p < .001$ ) and Austrian students assessed their own competencies better than German students ( $F(1, 493) = 4.08; p < .05$ ).

Regarding students' self-assessed comprehension of technology there were two significant main effects. Engineering students rated their own comprehension of technology higher than non-engineering students ( $F(1, 493) = 16.22; p < .001$ ) and male students rated themselves better on this feature than female students ( $F(1, 493) = 8.19; p < .001$ ). A significant interaction effect "sex by nationality" could be detected. Austrian male students showed higher values than Austrian female students whereas between German male and female students only smaller differences could be stated ( $F(1, 493) = 3.99; p < .05$ ). There was also a significant three way interaction "field of study by sex by nationality" ( $F(1, 493) = 4.38; p < .05$ ). Whereas in Germany male and female engineering students both showed high values in this feature – males higher than females, while male and female non-engineering students' self-assessment was equally low, in Austria male non-engineering- students rated themselves slightly to be better even than engineering students did as a group .

## **5.6 Attitude towards science and technology**

Two factors could be found:

Factor I: "Science as a global chance" (3 items,  $\alpha=.543$ )

Factor II: "Science as a danger for nature and mankind" (3 items,  $\alpha=.622$ )

With respect to factor I no differences between groups of students were discovered. In general, attitudes towards science and technology were definitely positive ( $M=3.15; SD=.54$ ). However, non-engineering students saw more dangers of science and technology than engineering students ( $F(1, 498) = 16.30; p < .001$ ) and there was also a significant main effect for nationality ( $F(1, 498) = 4.81; p < .05$ ). Austrian students anticipated more problems than German students.

## **5.7 Occupational image of an engineer**

Students were asked about their beliefs with respect to several features of the engineering profession.

Factor analysis yielded three factors:

Factor I: "Heavy work load and responsibility" (3 items,  $\alpha = .619$ )

Factor II: "Work-life balance" (3 items,  $\alpha = .766$ )

Factor III: "Less management than machine-oriented tasks" (2 items,  $\alpha = .403$ )

For factor I two significant main effects could be stated. Engineering students assessed work load and responsibility of an engineer to be higher than non-engineering students ( $F(1, 481) = 16.13$ ;  $p < .001$ ).

German students in general rated work load and responsibility to be heavier than Austrian students ( $F(1, 481) = 5.79$ ;  $p < .05$ ). This difference was mainly caused by the fact that Austrian non-engineering students showed lower values on this factor ( $F(1, 481) = 4.16$ ;  $p < .05$ ).

With respect to factor II "work life balance" an interaction effect "field of study by nationality" appeared. There was no difference between German engineering and non-engineering students, but Austrian engineering students saw more difficulties to balance work and private life than Austrian non-engineering students ( $F(1, 473) = 5.30$ ;  $p < .05$ ).

Regarding factor III there was a significant main effect for field of study. Non-engineering students were more convinced than engineering students that an engineer has to do many machine-oriented and less management tasks ( $F(1, 477) = 7.96$ ;  $p < .01$ ).

## **5.8 Ideal characteristics for working in an engineering occupation**

Students were asked to what extent they supposed several features to be necessary for working successfully in an engineering occupation. For this part of the questionnaire 4 factors could be defined:

Factor I: "Technical and cognitive competences" (7 items,  $\alpha = .659$ )

Factor II: "Team orientation, social and leading competencies" (5 items,  $\alpha = .754$ )

Factor III: "Ambition and self-assertiveness" (3 items,  $\alpha = .741$ )

Factor IV: "Competence to balance work and private life" (4 items,  $\alpha = .649$ )



Students in general rated the importance of technical and cognitive competencies as high for working successfully as an engineer ( $M=3.08$ ;  $SD=.45$ ). There was a significant main effect for field of study. Non-engineering students supposed these features even to be more important than engineering students did ( $F(1, 492) = 10.76$ ;  $p<.01$ ).

Students altogether were convinced that team orientation and social competencies are important features for an engineer ( $M=3.2$ ;  $SD=.53$ ): No significant differences between subgroups could be found.

Likewise all students rated ambition and self-assertiveness to be necessary ( $M=3.11$ ;  $SD=.66$ ). However, there was a tendency ( $F(1, 489) = 3.61$ ;  $p=.058$ ) for engineering students to assess this feature as to be more important than non-engineering students did .

For factor IV a main effect for field of study could be stated. Engineering students rated the ability to balance work and private life as to be more important for an ideal engineer as non-engineering students ( $F(1, 488) = 5.98$ ;  $p<.05$ ).

## **5.9 Career expectations**

Factor analysis of the part of the questionnaire concerning students' expectations for their occupational careers yielded four factors:

Factor I: interesting job with possibility to play a part in (7 items,  $\alpha=.829$ )

Factor II: working in research or industry (3 items,  $\alpha=.729$ )

Factor III: save and easy job (4 items,  $\alpha=.710$ )

Factor IV: high career aspirations (5 items,  $\alpha=.661$ )

Students in general wished to work in an interesting job with the possibility to be initiative ( $M=3.6$ ;  $SD=.44$ ).

Two main effects – for sex and nationality – could be stated. Female students rated this factor to be more important than male students ( $F(1, 493) = 3.99$ ;  $p<.05$ ) and Austrian students had higher values than German students ( $F(1, 493) = 5.82$ ;  $p<.05$ ). There was a tendency for an interaction effect “field of study by nationality” ( $F(1, 493) = 3.68$ ;  $p=.055$ ). Austrian engineering students rated this factor to be more important than German engineering students, whereas Austrian and German non-engineering students did not differ significantly in their answers.

With respect to factor II a significant main effect concerning field of study appeared. Engineering students aspired to work in research or industry to a higher degree than non-engineering students did ( $F(1, 479) = 277.99$ ;  $p<.001$ ).

To work in a secure job with enough leisure time was important for all groups of students ( $M=3.36$ ;  $SD=.54$ ). However, non-engineering students rated this perspective as even more important than engineering students ( $F(1, 492) = 7.21$ ;  $p<.01$ ).

For factor VI three significant main effects could be stated. Engineering students had higher career aspirations with respect to leadership or management positions or making an academic or international career than non-engineering students ( $F(1, 481) = 10.42$ ;  $p<.01$ ), male students' aspirations were higher than females' ( $F(1, 481) = 5.35$ ;  $p<.05$ ) and Austrian students had higher aspirations than German students ( $F(1, 481) = 11.19$ ;  $p<.01$ ).

## **6. Summary and discussion**

The results of this study confirm several gender differences often found in empirical studies, differences which are supposed to be responsible for the lack of females avoiding the field of STEM:

Female students remembered lower self-efficacy and a lower intellectually and practically based interest in science and technology already in primary school (see also Endepohls-Ulpe, Stahl-von Zabern & Ebach, 2010). Their actual self-concept with respect to cognitive and general technical abilities was low and likewise their self-concept with respect to practical know-how in technology, ICT competencies and comprehension of technology. Teachers apparently do not impart the importance of technology and raise any interest for technological themes in girls.

Females on the one hand have high expectations concerning the quality of occupation (more responsibility, work in an interesting job, possibility to be initiative, apply personal skills) but on the other hand have lower career expectations with respect to attainment of leadership and management positions, having an international career or an academic career (see EURYDICE/EACEA, 2010). Some of these characteristics are also true for female engineering students – at least when compared to their male colleagues.

Compared with their peers in non-engineering fields of study, male and female engineering students reported higher self-efficacy, and intellectually and practically based interest with regard to technical and science themes already in their primary school years. With respect to intellectually based interest female engineering students did not even differ from their male peers. Male and female engineering students remembered more support by their fathers concerning technical activities and interests during childhood (see also the chapter by Elisabeth Sander, in this volume). In addition to that, Austri-

an engineering students reported more support from teachers and parents in mathematics and science in their secondary school time. In general, engineering students showed a higher self-concept with respect to general cognitive and technical abilities and a higher self-concept with respect to practical know-how concerning technology, ICT and comprehension of technology. But especially regarding these parts of the self-concept, female engineering students had similar self-handicapping beliefs as their peers from non-engineering fields of study, at least in comparison to male students from their own field of study.

Thus the results of the study show the importance of early influences on interest and self-concept for choosing a career in the field of STEM. Female engineering students, in spite of having chosen a technological field of study, still feel less capable with respect to some important fields of their later profession than male engineering students do.

All engineering students expressed more positive attitudes towards science and technology and their images of an engineer seemed to be more modern, especially with respect to social competencies and leadership abilities required. They also seemed to be more ambitious and have higher career aspirations than their peers from non-engineering studies.

Regarding cross-national differences the most eye-catching fact is that Austrian schools seem to be more supportive to students in the field of STEM. Thus, Austrian students assess the role that parents play in this field smaller than German students do. But apparently mainly males seem to benefit from institutionalized technology education, maybe due to the gender stereotyped choices students make concerning school subjects like textile craft vs. technical craft. Austrian students in general seem to have a higher self-concept of their ICT competences. This could be a consequence of a relatively better ICT equipment of schools. In comparison with most of the other European countries German schools are not very well provided with computers (Federation information industry telecommunication and media, e.V., cf. Karl, 2007, pp. 14 ff). Another interesting difference is that Austrian engineering students assess their self-concept of general technical competencies lower than German engineering students. One could assume that German engineering students are a more extreme selection with respect to their self-assessed technical abilities.

Finally the results of this study reveal the impact of cross-national gender stereotypes on students' attitudes and self-efficacy in the fields of science and technology. Educational systems both in Germany and Austria do not seem to be able to overcome these mechanisms.

Interest and self-efficacy with respect to technology already seem to arise very early – the results of this study show that engineering and non-engineering students already differed in their interest in science and technology during their primary school time. Thus, intervention programs, especially for girls, but also for boys, as technology education is apparently not very successful for boys and girls, should start in pre- or primary school. Besides, intervention programs for female secondary and even university students in technical courses of study with respect to their self-concepts of technical and ICT abilities seem to be essential in order to support these female students in pursuing their interests and careers.

In Austria, technology and crafts education is compulsory in primary school. Secondary students can choose between technical work and textile work. Nevertheless, predominantly male students seem to benefit from technology instruction. Thus technology as a subject should be compulsory in order to reach the girls.

Occupational images of an engineer slightly differ between engineering and non-engineering students. Promoting a modern as well as a realistic occupational image of an engineer as a person who has to fulfill management as well as machine-oriented jobs, who needs social skills and is able to balance work and private life probably could be helpful to encourage more students to take up a course of study in an engineering profession.

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## **Searching for ways to encourage and enable equal access for girls to study technology**

### **1. Introduction**

Several studies conducted by the European Union (e.g., Eurostat, 2004) demonstrate that women and girls continue to be dramatically underrepresented in education, fields, and jobs related to technology. The European project UPDATE (Understanding and Providing a Developmental Approach to Technology Education; see also Endepohls-Ulpe, Ebach, Seiter & Kaul in this volume) revealed that there is a great demand for new learning materials and pedagogical practices in technology education. In Finnish primary schools technology is mainly taught during craft, particularly technical craft lessons. Craft as a subject has been divided into technical craft and textile craft. Boys have traditionally studied technical craft and girls have chosen textile craft. National Framework Curricula (1994 and 2004) and the Committee on Alleviation of Segregation (2010) advocate that the introduction to craft encompasses technical and textile craft contents and should be implemented with the same content for all pupils. However, this gender-specific division of crafts has been maintained in schools and it is still reality for many pupils.

Equality and non-discrimination must be actively promoted as part of education, guidance and school culture while practices that prevent equality should also be dismantled. All pupils must be provided with equal opportunities to acquire the knowledge and skills required in society and working life. In crafts this means that pupils should have equal opportunity to study technical and textile craft. Furthermore, the pupils should have the chance to have the same amount of lessons for both of the subject areas – technical and textile craft, during comprehensive school (Ministry of Education and Culture, 2010). Only if these conditions are met all pupils will get equal opportunities to study technology as well. However, giving pupils an equal opportunity to study technology is not enough. In order to promote girls' interest and encourage them to study technology, new improved practices need to be created.

The purpose of the present study is to describe what technology education is in Finland according to the 2004 National Core Curriculum (NCC).

In addition to that, one aim is to obtain information on what could increase the girls' motivation to study technology at grades 5–6.

## 2. Gender stereotypes and technology education

Traditionally technology has been a field dominated by males and it is regarded as a topic closely connected to the male gender stereotype. This demonstrates that, in terms of gender, technology is extremely value laden (Dakers, Dow & McNamee, 2009, p. 382). Preschool-aged children have already started to develop gender role stereotypes and it seems that the process of females turning away from the field of technology starts at that time. At the early years and later at the beginning of primary school, children's gender stereotypes adhere to the cultural standards concerning toys, activities and vocational roles. Boys' toys are often electronic and girls' toys are based on developing social skills. (Turja, Endepohls-Ulpe & Chatoney, 2009, p. 353; Weber & Custer, 2005, pp. 55–56.)

In Finland there is no school subject called technology. Since the introduction of the 2004 NCC, there has been a cross-curriculum theme called "Human being and technology". It is one of the seven themes that should be considered in all subjects. Craft is a separate subject in the comprehensive school (compulsory in grades 1–7 and optional in grades 8 and 9) and it comprises contents of textile craft and technical craft. However, there is considerable overlap between many objectives and contents of the cross-curriculum theme "Human being and technology" and those of technical craft. Based on the analysis of NCC, technology is mainly taught during technical craft lessons (Rasinen, Ikonen & Rissanen, 2008).

The division between girls' and boys' craft has been regarded as a "natural choice" that needs no justification (Kokko, 2007, p. 55). From the National Curriculum of 1970 onwards it is been emphasized that there should be no longer a division, but both should study the same contents from grades 1–3, and afterwards choose one of the subject areas for grades 4–7. In the Framework Curricula for Comprehensive Schools from 1994 and 2004, craft, which included technical craft and textile craft, formed an entity which was directed at all pupils, regardless of gender. In addition, pupils may be given the chance (for grades 5–7), in their craft studies, to emphasize either technical or textile craft according to their interests and inclinations. The documents allowed municipalities and schools to write their own curricula and therefore nothing actually changed in practice (Rasinen, Ikonen & Rissanen, 2006, pp. 450–452). In most schools, pupils still choose between technical



craft and textile craft after grade 4 (at age 10), even though the 2004 NCC states that craft is one subject (with the same contents) for all pupils.

Because of the long tradition of gender-biased division, the contents of textile and technical craft have been put together in a way that they maintain traditional gender stereotypes. As a result girls who choose textile craft, which is easily connected to female gender stereotype, deny themselves to the exposure to technology-related contents that are part and parcel of technical education.

Craft and technology education in Finland reveals a strong gender-related dependence. The division of technical and textile craft is one of the still existing, informal practices that maintain and generate gender-related power and influence (see Kokko, 2008, p. 348).

### **3. An analysis of National Core Curriculum in Finland**

A content analysis was performed in order to find out and describe what technology education is based on in the 2004 NCC. In the following, *a framework for content analysis* of the curriculum is introduced. The framework was created to examine *learning processes in technology education*. The advanced level of learning (level 3), i.e. invention, problem solving and creative thinking were specially focussed. The levels describe pupils' mental process of understanding and their level of technological competence (see fig.1).

*Level 1:* pupils gain fundamental information about phenomena behind technology, usefulness of technology and various materials and tools.

*Level 2:* pupils can recall items of technological knowledge or phenomena, identify and explain their usefulness in everyday life or apply them in simple situations.

*Level 3:* in a given formalized context, pupils are able to apply their knowledge and skills in practice and combine them to create innovative solutions in order to solve a problem.

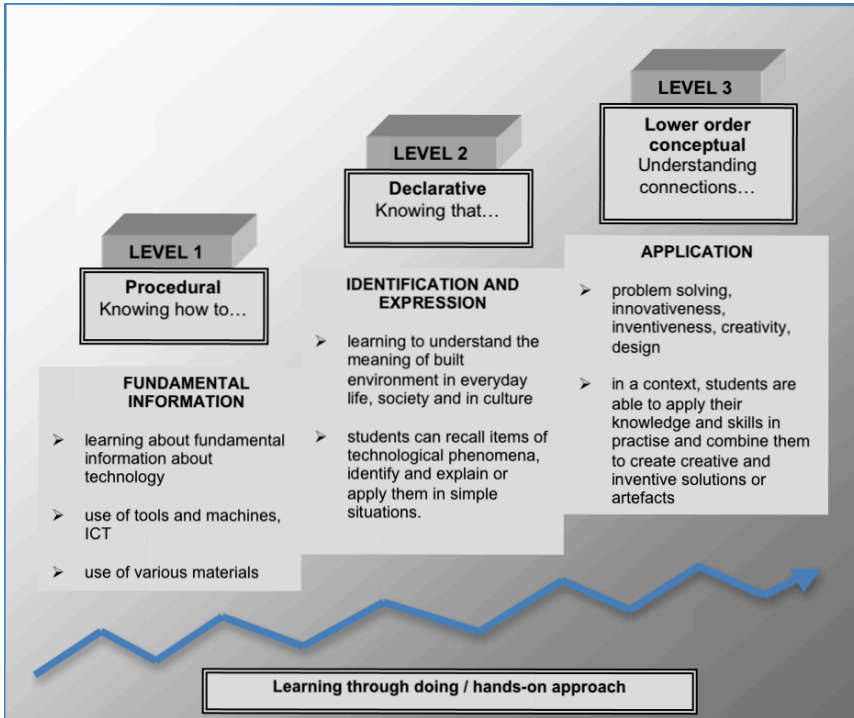


Figure 1: Framework for curriculum analysis: Pupils' mental process of understanding and their level of technological competence.

Level 1 and 2 describe the fundamental levels of the pupils' technological competence, whilst level 3 describes the highest level of learning: understanding, application and invention. Level 3 comprises many conceptual and functional levels, such as knowledge of materials and tools, know-how, understanding of the concepts of technology and their application. It is important that the knowledge one has is being applied or put into practice in an innovative and creative manner. The innovation process is associated with brainstorming, problem solving, innovativeness, inventiveness, designing, modeling, evaluation, experimental approaches, creativity, as well as aesthetic and ethical aspects. The aim of the activity is to integrate awareness raising, learning and design processes in order to enable the application of these steps and create innovative solutions. In technology education the 'learning by doing' method has a central role in innovative problem-solving processes.

The analysis of NCC reveals that, pupils are encouraged to learn important skills like innovativeness, inventiveness, creativity and problem solving

only during *craft*, particularly *technical craft* and *visual arts* lessons. Technical craft can be regarded as supporting technology education by encouraging pupils in the creative use of various materials and techniques for different purposes. Technological aspects can also be studied in natural science lessons, such as environmental aspects or technology in everyday life. However, based on the curriculum analysis, these lessons do not emphasize the development of skills like innovativeness, creativity or inventiveness. In *visual arts* the objectives of the instruction are to foster pupils' imagination and promote skills in creative problem solving and investigative learning. The learning process is similar to the technological innovation process; planning, making a sketch, completing a piece of work or task and evaluating it. Although the activity in visual arts cannot always include technological content, meaningful and integrative projects between technology educational themes and visual arts would increase holistic teaching. (Rasinen, Virtanen, Endepohls-Ulpe, Ikonen, Ebach, & Stahl-von Zabern, 2009, p. 373.)

2004 NCC comprises seven cross-curricular themes, which should have the central emphasis on educational and teaching work. During cross-curricular theme activities namely *Human Being and Technology* pupils are encouraged to learn creative problem solving by making technology. The cross-curricular theme namely *Participatory citizenship and entrepreneurship* encourages pupils to act innovatively and perseveringly in achieving a goal.

If pupils (boys) are encouraged to learn technological innovativeness, inventiveness, creativity and problem solving mainly during technical craft lessons, girls in textile craft will be left out of these technology-related objectives. In order to change attitudes and practices, it seems insufficient to only change the curricula, technical and textile craft into one subject (with contents of technical, textile craft and technology). In addition to that, gender-sensitive approaches should be applied. This would involve reconsideration of both learning objectives and contents. The following study seeks answers to this need.

#### **4. Pupils' motivation towards technology education**

To examine the difference between girls' and boys' motivation for pursuing technology education, a questionnaire study was carried out. Motivation can be divided into various kinds of motives, which function as a basis when conceptualizing and analyzing it. Students' perceptions regarding their work on a particular learning task and achievement goals play a large role

in determining their motivation and the strength of the individual motives. (Shachar & Fischer, 2004, p. 73; Kosonen, 2010.)

The questionnaire was created on the basis of the theory of motivation (Kosonen, 1996). The first part of the structured questionnaire consisted of closed- ended questions concerning background information: age, gender, information about whether pupils have studied technical craft or textile craft or both at school. The second part of the questionnaire consisted of a series of statements (1–32). For each statement, which concerned different technological activities related to various types of motives, pupils were asked to mark their degree of agreement or disagreement on a Likert scale of 1–4 (1= I fully agree, 2= I partly agree, 3= I partly disagree, 4= I fully disagree). In the questionnaire, the statements were categorized but mixed.

The motivation categories and statements in questionnaire:

*1) Motives based on emotional experience*

1. I like the crafts that we do at school.
3. When working in a craft lessons, the work carries me away.
2. I like it if I can use tools well.
29. It is important to me that my artefact is well made and looks nice.

*2) Motives based on the contents of technology*

1. I like the crafts that we do at school.
22. I don't care what kind of artefacts we are doing in craft lessons.
4. It is fun to learn how to use different tools.
18. I'm interested in inventing solutions for keeping the environment clean.
19. I would like to learn how to preserve nature.
20. I like building and constructing things.
23. I would like to study how commercials affect people.
24. I want to learn about the risks of using internet.
25. I would like to make a useful artefact for my home.
26. I like to make decorative artefacts.
27. I like to build electronic devices.
28. The best thing for me is if I can create my own idea and realize it.

*3) Motives based on accomplishment and achievement*

21. I think that we are doing too easy projects during the craft lessons.
5. I'm afraid of doing something wrong.
14. I often feel that I can't learn new things.

4) *Motives based on social interaction*

6. I think the craft teacher is good at instructing us. (*This Item was omitted in further analyses.*)
8. I think it's important that the teacher supports and encourages me.
9. My family encourages me to do crafts.

5) *Motives based on reluctance*

7. I often feel bad when doing craft.
15. The craft teacher is too demanding.
16. I think doing craft is boring.

6) *Motives based on working process*

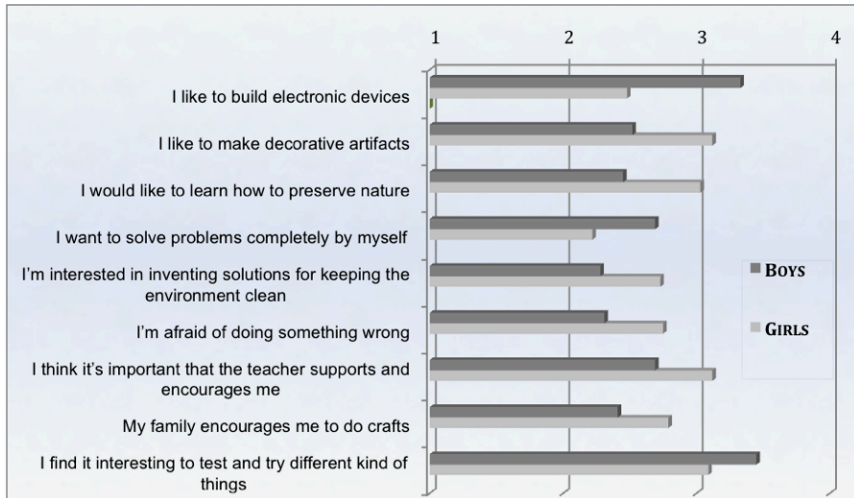
10. I think it is good that a teacher tells exactly what to do next.
11. When I face a problem I want to try to solve it on my own with the help of my friend or the teacher.
12. I want to solve problems completely by myself.
13. I like working in groups.
17. I rather work alone than with a friend.
30. I think group work is not suitable in craft lessons.
31. I think it is interesting to test and try different kind of things.
32. I like it when everyone makes exactly the same kind of artefact.

The data consisted of answers of 300 pupils, aged 11–12 years (150 girls and 150 boys). The data was collected in spring 2009 and pupils were chosen from schools in larger municipalities and from schools in smaller municipalities, from various parts of Finland. 47.7% (29 girls and 114 boys) of all pupils have studied technical craft, 32.7% (92 girls and 6 boys) textile craft, 18.3% (28 and 27 boys) have studied both and 1.3% didn't answer to this question. When pupils were asked about craft artefacts or the use of tools and working in craft lessons, the answers were in general very positive. Some examples of statements that the pupils agreed with:

- *"I like the crafts that we do at school"* (86%).
- *"It is important to me that my artefact is well made and looks nice"* (86%).
- *"When working in a craft lesson, the work carries me away"* (74%).
- *"I would like to make a useful artefact for my home"* (82%).
- *"The best thing for me is if I can create my own idea and realize it"* (83%).
- *"I like building and constructing things"* (79%).

In addition to frequencies a t-test was used to compare girls' and boys' answers to each of the statements (1–32) separately. Table 1 presents the statements and greatest mean differences, between boys and girls, with a p-value of  $< .001$  (\*\*\*)

Table 1: Statements that showed the greatest difference between girls and boys: (1 = I fully disagree, 2 = I partly disagree, 3 = I partly agree, 4 = I fully agree)



\*\*\*  $p < .001$

These findings show that the greatest differences between girls' and boys' motives, in relation to the theory of motivation, appeared to be linked to the motivation category 2, namely *Motives based on the contents of technology education*. Compared to girls, boys preferred to build electronic devices. One explanation for this might be that electronic devices or projects that have electronic parts are mainly done during technical craft lessons and most of the girls included in this study have studied textile craft at school. Therefore, girls do not know much or anything about building electronic devices, which might affect this outcome. The second greatest difference appeared to concern the aesthetic aspect of the projects done in craft lessons. Girls cared more than boys about their artefact being decorative. These findings also showed that girls were obviously more interested in learning how they could preserve nature and find solutions for keeping the environment clean.

Another significant difference between girls' and boys' motives, in relation to the theory of motivation, appeared to be linked to the motivation categories 6) *Motives based on working process* and 4) *Motives based on social interaction*. Based on these results it can be claimed that boys seem to have

a better mastery of working in craft lessons than girls and are more self-confident. Boys are more willing to solve problems independently, test and try different kinds of things and they do not need much help or encouragement from the teacher when constructing projects.

Social interaction seemed to matter more to girls because they consider it more important to receive support and encouragement from the teacher and from family members. Girls' replies also showed that they were more afraid of doing something wrong while working. This clearly demonstrates girls' need to receive encouragement and appreciation for their technical competence, particularly from their teacher.

## **5. Conclusion**

One purpose of this study was to describe what technology education is based on the 2004 NCC in Finland. The second aim was to obtain information on what could increase the girls' motivation to study technology at grades 5–6. Based on the NCC analysis it is important to notice that only during craft, particularly technical craft lessons pupils (boys), are encouraged to learn technological innovativeness, inventiveness, creativity and problem solving. Girls, who mainly study textile craft at grades 5–6 will be left out of these technology-related objectives that are part and parcel of technical education. Does gender-related division in crafts affect women later when they consider studying and working in fields related to technology?

The findings about pupils' motivation towards technology education revealed that in general pupils liked the crafts that they do at school. It is apparent from the findings that the greatest differences between girls' and boys' motives appeared to be linked to motivation category 2, motives based on the contents of technology education. Girls might often associate technical craft and the way of working with the rough and masculine, rather than the aesthetic or feminine. Therefore, it can be suggested that teachers should pay more attention to providing girls with opportunities for creating aesthetic products. Teachers should also introduce environmental aspects related to technology education and encourage girls in technological studies, in order to promote girls interest towards technology education.

In short, by giving girls an equal opportunity to study technology, i.e. not to ask them to choose between textile and technical craft and by addressing the aspects of technology education that are mentioned in this study, girls might regard technology as a field offering them more potential in the future.

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## **Biographies of female scientists in Austria – results of an interview study**

### **1. Introduction**

When dealing with the subject of “gender and vocational choices” it becomes evident that women show a restricted behaviour in their career choices. Although they are equally well or better qualified than their male peers, they disproportionately often decide in favour of “typically female” professions or study courses. They are especially under-represented in mathematical, technical or in natural scientific professions. Thereby women give away the chance to shape technology according to their own interests and they also do not benefit from the exciting possibilities of the natural scientific and technical domains of work, either. Even highly-talented girls show the same “female” vocational choices; although one would assume that due to their excellent attainment in mathematics, computer sciences, physics or chemistry the access to rather male-dominated professions would be easier for them (Endepohls-Ulpe, 2006).

This restricted vocational choice is most obvious in the scientific world. There are considerably less women who work as university teachers than men and especially the position of a professor is only seldom held by a woman. This discrepancy is particularly observable in STEM (Science, Technology, Engineering and Mathematics) domains. Since the 1980s many professional biographies of female scientists have been investigated in Germany, trying to find out the reasons for this behaviour. Most of these studies were conducted with small samples and the applied methods and the scientific questions were different, whereas qualitative interviews predominated (see Lind, 2004). Since 1990 longitudinal studies have also been carried out. Thus, Abele for instance (1994) explored the professional career of 1930 graduates of the University of Erlangen-Nürnberg. Since 1998 she has followed up on the career of more than 1000 male and female mathematic graduates (Abele, 2000, 2003, 2011).

The previously mentioned rather small studies are based upon different and usually implicit models of explanation. According to Sonnert & Holton (1995) one can differentiate between a deficit model and a difference model. The deficit model assumes that women in the world of science and the world of work are treated differently than men. Studies which are based on

this model therefore explore the difficulties and barriers impeding the women's careers. Contrary to this hypothesis, the difference model assumes that women and men behave in a different way because they have different priorities and aims regarding their career. Accordingly, the barriers within a person are the primary focus, as for instance the gender-specific self-concept. By now there are also studies that explicitly refer to a specific theory. Thus, the small percentage of scientists in higher positions at universities is explained by the "acculturation theory". It is postulated that in a cultural integration process there usually is a gap of power between members of the foreign culture and those of the absorbing culture to the disadvantage of the foreign culture. When female scientists enter a scientific culture which is characterised by male norms and values, in contrast to the men they have to go through a process of acculturation, as they are forced to negotiate inner and outer resistance and to integrate these new norms into their own identity (Schultz, 1991). Based on the sociological "Habitus" theory (Bourdieu, 1982), to which a series of articles refer (e.g. Zimmermann, 2000; Beaufays, 2003), it is argued in a similar way. The concept of "Habitus" refers to the internalised habits of thinking, feeling and acting, which members of a certain group have in common. Thus, scientists for instance internalise the male values and habits of their group, which result in certain action strategies. Problems arise for female scientists if the "habitus" of their place of work does not agree with their female values, aims and needs.

Recently, therefore the question has been focussed on whether specific structures at universities or scientific institutions are important for the individual gender-specific courses of careers. These structures are thought to be based on characteristic values and aims of these institutions and organisations. (Allmendiger, v. Stebut, Fuchs & Brückner, 1999; Allmendiger, Fuchs, v. Stebut & Wimbauer, 2001; Wimbauer, 1999; Stebut, 2000; Matthies, Kuhlmann, Oppen & Siman, 2001).

The theories mentioned above are able to explain in general the small proportion of women in the field of science. For answering the question why girls and young women scarcely consider choosing a career in a STEM profession, theories of career choice can explain more. In this context one has to mention in particular the models of career choice by Eccles (1983) and Gottfredson (1981).

The well-known model of Eccles (1983), explaining sex-role behaviour in relation to vocational choices, ascribes a great importance to sex-role stereotypes. According to this model, stereotypes of professions which are dominant in a specific culture, as well as the sex-role convictions of parents or teachers influence the subjective perception and evaluation of a profession. It is assumed that a person's experiences in the course of his or her

socialisation account for the emergence of a certain aspiration for success concerning vocational trainings or academic courses. Therefore, one can say that these experiences are one of the decisive factors for vocational decisions (see Abele, 2003).

The theory of Linda Gottfredson (1981) also can explain gender-specific career choices. She understands career aspiration as an attempt to integrate one's self-concept into social reality. According to her, careers are classified in a sort of cognitive landscape, which all people of a specific culture share. Three dimensions of this landscape are important: The gender typicality of a profession, its prestige and the characteristics of the working domain (What activities are dominant in this profession, what requirement profile is set?) Whether a vocation is taken into consideration at all, depends upon whether it is subjectively perceived as compatible with one's self-concept. According to Gottfredson (1981) alternative careers are rejected in the course of a person's mental development in a typical way. Thus, the social aspects of the self-concept, i.e. sex-role orientation and performance orientation, are primarily responsible for the choice of a certain career.

Although the above mentioned theories differ in many aspects, they all agree in that the socialisation and the social surroundings, that is to say the individual biography of a person, are important for his or her career decision.

In the following study women were interviewed who in two respects chose an untypical career, by graduating in a STEM-study course and by working successfully in the field of science at a university or a research institution. We wanted to find out whether these women had experienced support or impediments regarding their mathematical, scientific and technical interests in the course of their socialisation (family, kindergarten, school, university, professional career), and if so, of what kind. The answers were to be analysed according to whether there are similarities or typical events to be found in the biographies of these women, which possibly enabled them to be successful in a typically male profession.

## **2. Method**

### **2.1 Survey questionnaires**

First an interview guideline was developed, referring to the current private and occupational situation, the family background, school and university experience and vocational career. In this context questions were also asked regarding people who had influenced the interviewee in their career decision

(major at university and later profession). The interviewees were also asked whether they had experienced restrictions or support regarding their vocational choices and what plans they had for the future (private and vocational). Finally, they were asked about their attitudes towards special programs encouraging women to study a STEM major.

## **2.2 Procedure and analysis of the interviews**

The half-structured interviews were mostly carried out in the work environment. Two women wished to be interviewed at home. The interviews were recorded with a recorder (sound storage medium), transcribed and analysed according to Mayring's suggestions on how to evaluate qualitative interviews. (Mayring, 2010).

## **2.3 Interviewees**

Since the interviewed women should preferably be a homogeneous group, only women were interviewed who were writing or had already written their first or second thesis in a STEM major. Finally 15 women who were characterized in the above mentioned way were interviewed. The youngest interviewee was 27 years old, the oldest one 65. About half of the women (7) were physicists, the vocational domains of the rest ranged from chemistry and biology to business informatics or plastics engineering. All the women worked at one of the universities of Vienna or at a research centre there. Three women were writing their first thesis, six women already had a PhD, four of them were writing their second thesis, one worked as a Post Doc and one had a position in the field of science administration. Six women who already had finished their second thesis worked as professors at universities, teaching and researching.

## **3. Results**

### **3.1 Current life situation**

Five professors are married or live in a stable partnership and four of them have one to two children. Among the rest of the women one is single (without child) and eight are married or have a long-term partner. Three of them

have children; one is living together with her husband and a stepson. Among the five women who do not have children yet two definitely expressed the wish to have children later.

The remaining women can principally imagine having children, although their plans are vague because they anticipate problems regarding the compatibility of career and family.

Among the 12 women who live together with a partner 10 partners are also working in a STEM profession. Most of the couples got to know each other at university.

### 3.2 Family background

All the women report that their parents were the most important attachment figures in infancy, only in two cases the grandparents are mentioned and once an aunt. Eight fathers were university graduates; seven of them had studied a STEM major. They worked or work as physicists, botanists or engineers, one father was a doctor. Among the remaining seven fathers six were craftsmen and only one had not taken a technical career. Most of the mothers were housewives or had been trained in a typical female profession, as for instance, a dressmaker or an office employee. Only four mothers were university graduates working as a lawyer, a neurologist and two worked as teachers who taught mathematics and physics at a Gymnasium (highest level of the Austrian secondary school system).

Most of the women say that their fathers had aroused their interest in mathematics, natural science and technology. Thus, one woman, whose father was an engineer, tells that he had intensively dealt with her and that he had explained technical interrelations to her. Answering the question whether her father was pleased seeing her playing with technical toys she says:

*“I would say yes, he tried to explain things to us. It is not as though he says, we just happen to be girls, and one does not do anything about technology with them.”* (IP13, 19)

She also tells us that her father always helped her when she had built anything:

*“Yes, but my mother was also with us, she herself had nothing to do with technology but she played with us, too.”* (IP13, 19)

A similar behaviour is reported about fathers who were physicists. Answering the question whether her father had influenced her career decision, an interviewee answers:

*“Yes, thoroughly; my father is a physicist himself. When we were a little older and made bicycle tours he would always talk about the conservation*

*of energy, because one does not dissipate energy, as one arrives at the same place; and similar things. As a child I was rather nerved by this. I did not want this, but I don't know whether it was supporting my technical interests in any way or not.*" (IP5, 23–27)

One interviewee got to know the close connection between medicine and biology by her father, who was a doctor. This knowledge finally inspired her to study chemistry and biology. (IP14, 36)

Only one woman emphasizes that her mother was her great ideal. She taught mathematics and physics at a Gymnasium and was the person who animated the interviewee to study physics. (IP10 60, 63–66, 77) One woman, whose parents both had studied a STEM major, says that even as a child she set for herself the goal to become a scientist, encouraged by her parents' interest in nature:

*"My parents were very much interested in nature. My father had a beetle collection and my mother taught me everything about any flower. That's it ... My parents were both very interested in this direction."* (IP8, 42, 44, 57–58)

Another woman whose parents both had a university degree indicates that influenced by these models it was always self-evident to her that she would go to university. She then decided to study a technical major as her father had done:

*"No, my mother was working. Both my parents were "very" working; accentuating the "very" ... Natural science was not that important. What was important was that my parents and the friends of my parents always said: you have parents with a university degree, so you both will study, too. It was never a question for me, that I would not aim at a university degree."* (IP2, 49, 82)

All the women whose father was a craftsman say that their interest in technology was evoked by their father when they were helping him with technical activities:

*"When I was a child I did not yet have an interest in natural science. I rather was fascinated by the job of my father, he was or is a carpenter. This was totally fascinating for me. I wanted to become a carpenter, too and create something manual ... In his workshop I was allowed to try out something and to do handicrafts ... This was amazing."* (IP4, 26)

*„Mathematics comes from my father, mathematics, logical thinking and structural thinking. That is my father. I have this from him, with a hundred percent certainty, the love of numbers. They all say that I can remember data very well. It is very easy for me to remember number data. I also have*



*the feeling for dimensions from my father. My father was a carpenter. All his life he worked with (laughing) circle and pencil ... This love of technology and technical handicraft derives from my father ... I know my parents only as working. They have always worked, even in their leisure time they have built houses, houses for themselves and then houses for the relatives. It was self-evident that we children had to (were allowed to) help ... whatever. I climbed up the roof structure and held the wood ... I had much fun. Although I now do not do it any longer, I love manual activities very much. It is an amazing experience to see how a product is created.”(IP9, 49–50)*

Interviewees also say that they were often taken to the workshop of their father and were allowed to observe everything:

*“No, he was a carpenter but had always worked as a crane operator. He often took me there and showed me everything.” (IP1, 76, 70, 80)*

Two women indicate that their grandmother encouraged them to be curious, and that as a consequence they have developed a great interest in science:

*„Well, my mother was working, she is a teacher and soon after my birth she was working again. Luckily, my grandma was at home, she still lives in the same household as my parents. She more or less brought up the children. She often tells me that I always drove her crazy with questions, I wanted to know everything, Granny why is this so or so? She seems to have been very patient and she tried to explain things as well as she could. I think, this was one of the first steps towards my profession because my curiosity was not restricted but supported ...” (IP4, 20)*

Spontaneously two women report that their fathers notably supported them in their vocational choice:

*“Although there was this dominant idea that girls should study languages, in my family I never heard that physics or chemistry was not good for me ... up to a certain degree, my father supported my choice of a course in physics.” (IP1, 130–131)*

None of the interviewees say that their parents had detained them from studying a STEM major in any way. Two women say, however, that their parents doubted whether a university course of technology or a university course aiming at a scientific career instead of becoming a teacher was the right thing for a woman. But finally they accepted the interviewees' decision.

### 3.3 Preschool and schooldays

Nearly all of the women had been at a kindergarten. They agree in not remembering any activities there that would have aroused or supported their interest in technology and science. This also is the case with primary school. No interviewee can name a teacher who had been active in this way.

However, the experiences at the Gymnasium are different. Six women state explicitly that they had not felt assisted in their interest in technology and science:

*“My physics teacher in the Gymnasium was of the opinion that women are not able to get a driving licence, because they do not understand why a diesel engine has no spark plug. This was his opinion. Women have no idea of science, they cannot understand it. He had no enthusiasm as a teacher. We hardly did anything in physics. By most of the girls this teacher could feel affirmed. They did not learn anything, wore decolleted clothes and passed the repeat examinations. I was always in between. I wrote very good tests, I was good in physics and had to hear silly comments ... My chemistry teacher said:” ... Do not come to the chemistry examinations ... you’ll anyway get your “I”. If you are here, all the others will only copy from you. I’ll give you a “very good” without examination; otherwise I cannot find out, what the rest of the class really know.” This was our chemistry classes. We had the same teacher in biology and the instruction was of a similar quality ...*

*There were three groups: computer science, Russian and French. The teacher of computer science did not want any girls to attend the computer science group, because girls were so “far behind”. If girls were there who did not know anything and boys who had a high knowledge of computer science, he would have no chance in instructing such a heterogeneous group ... Then I took Russian.*

*My mathematics teacher would have never admitted that I was good in mathematics, or that a girl could be good in mathematics ...” (IP11, 79, 81).*

Four women say spontaneously that the mathematics or physics classes were terrible.

*“I was not much interested in physics or mathematics or anything else. I had a bad mathematics teacher. He was a nice person, but he could not explain anything. The consequence of this was that we explained things to one another.” (IP1, 92)*

*“The mathematics classes were of different quality, depending on the teacher but you could forget about the physics classes.” (IP8, 60)*

One interviewee envied her brother because of his fantastic physics teacher. She herself experienced very bad physics classes:

*“No, we were a co-ed class. There were more girls, but we definitely were co-eds. So all of us did not get to know much about mathematics and physics. This, however, turned out to be an advantage. As we did not do much in physics, I was often picked on and converted formulas, which was not difficult for me. That was not a problem at all. As a consequence I got encouraged and said: I’m going to study physics. If we had had a teacher who would have demanded much it might have been that I would have been frightened, because physics in fact is difficult. It may be an advantage, if you do not know what you are heading up for... (laughing) ... We had a physics teacher, who was the physics teacher at our school. When he substituted a different teacher, I was fascinated, I must say!” (IP12, 64, 83)*

One woman talks about overall negative experiences at a gymnasium with a focus on natural sciences. Another one did not feel supported at the Gymnasium but emphasises that girls were not discriminated at her school:

*“There certainly were more boys ... in the last two years one had to decide between old Greek, a modern language, or a scientific major, and we were two girls in a scientific major ... However, we were not looked at as birds of paradise by the teachers. I must admit that everything was equitable.” (IP2, 102).*

Positive experiences are also reported. One woman did not feel especially supported in her interests but had a very good teacher in mathematics and physics:

*“Well in mathematics we had a really good teacher. I enjoyed this and she taught us much. I would not say that there was nobody who supported me. And in the last two years we had a very dedicated young teacher in physics who had just finished her studies and she did many experiments with us.” (IP13, 32)*

Another woman did not feel very much supported at the gymnasium but she had a very dedicated young physics teacher who aroused her interest in physics:

*“During the last years at the Gymnasium I was given a book about astronomy. I do not know exactly why I was given it but I was totally fascinated. I then read about the stars and the stellar evolution. This was great, and then I began to deal with astronomy and read various books about this subject. Later on I joined a club of hobby astronomers and the interest for physics started to grow. If one deals with astronomy one also needs phys-*

ics, and so eventually I liked physics more and more at school. We then also got a young dedicated physics teacher, and so everything went well together.” (IP4, 44)

Two interviewees report that they felt especially supported by their physics teachers (IP5, 36–37, 47–48; IP6 68).

Two women in general had very good teachers in different subjects in the sixth form whose personality had model character and who encouraged them to choose a major which was rather uncommon for a girl. (IP10, 99; IP14,76). Another interviewee was encouraged by relatives who were interested in science to attend a physics lecture at university, when she was still at school. As a consequence she studied physics (IP10, 99); another one was interested in physics due to work experience in an observatory (IP8, 62).

Two interviewees report spontaneously that, being interested in natural science, they were outsiders. They themselves, however, and their friends accepted this role and therefore they did not suffer from this experience.

*“We were a relatively small class with a high percentage of girls, and we did relatively well in mathematics and science, but my friends were not really fascinated about physics or technology ... I did not feel as an outsider. I do not know, but perhaps at school I was looked at as a little crazy or so ... No, I always liked to immerse myself in books about very different domains, not only physics. I read much about history and excerpted the contents of these books. Often in my afternoons I was sitting at my desk and when I had finished my homework, I elaborated on something and was fixing posters on the wall of my room. Well, I have always worked by myself and have done “research” as it were ...*

*... for my best friends this was quite normal. This was simply a part of me.”* (IP4, 45–49, 51–51).

### 3.4 Study and career

All the women state to be very satisfied with their career choice. About half of them (9) say, they had never felt discriminated but rather supported during their studies and in the working world. Thus, one woman says: “... *the university teachers encouraged women*”; (IP13, 61) another one reports that she was greatly supported when writing her thesis and says about her boss: “*I feel very much supported by him ...*” (IP12, 135). Her boss had also made his weight felt for her to become a telecommuter. Therefore, she can work at home and so has found a better agreement between family and career. (IP12, 135) Another interviewee mentions something similar. Her professor sup-

ported her when writing her first and second thesis and he encouraged her to apply for a professorship:

*“The professor wrote to me ... at ... there is a free professorship ... when will you apply for it?”* (IP14, 106)

It is also reported about a (female) university teacher who not only supported the interviewee when writing her thesis but became a mentor to her throughout her entire career. (IP15, 9)

The remaining women talk about being supported as well as about situations in which they had felt discriminated or inconvenient. One woman for instance says that she felt supported by some females who were studying physics and had started to form a group: *“We were quasi this small group against the rest of the world of men”* (IP4, 73) She herself had never been discriminated by university teachers but had experienced that some of them discriminated groups consisting of only women in practical courses. (IP4, 73) Another interviewee talks about diverging experiences. On the one hand she was supported by a female university teacher but on the other hand she felt discouraged by some older male university teachers by comments like: *“... for as a woman, I probably only had to care for children, relatives, and horses.”* (IP11, 117)

Also prejudices of male students against women are reported:

*“(One student for instance said): “I don’t know whether you are able to do that, if you do not have a boyfriend, who can help you” ... if one asked another male student sometimes one got no answer, because the male students thought, one was too stupid to understand it anyway.”* (IP1, 142)

Yet the same woman emphasizes that she never experienced any prejudices of their university teachers, although they were not really approachable. (IP1, 146)

One interviewee once heard the following comment of a university teacher: *“There is something wrong with the brains of women.”* (IP2, 102) She also experienced indirect rejection by some teachers during her university classes. (IP1, 128) However, she points out that she has never experienced any prejudices since being a university teacher herself. (IP2, 138).

However, prejudices may also be experienced as motivating. Thus, one woman who principally felt supported when writing her first and second thesis remarks: *“Well, I can remember some comments (by male university teachers) ... . But they rather made me think: “Well, I’ll have the last laugh!”* (IP8, 100)

One interviewee, although she felt supported during university classes and during her professional career at university, reports about strong preju-

dices against her while working in the industries. During practical work in an industrial concern she only had negative experiences. (IP6, 24)

*“One is not taken seriously. It is a men’s domain and the concerns are mostly headed by conservative men.”* (IP, 115–116)

### **3.5 Opinions on special support programmes**

Thirteen interviewees gave an opinion on special support programmes for women in technology and science. Seven of them think such programmes were important and made sense. Six of them have a rather ambivalent attitude towards such programmes. The following reasons for this ambivalence are mentioned: women who are supported by such programmes are often less accepted (IP3, 110) or some programmes overemphasize the discrimination of women. (IP11, 212) One woman says: “I don’t know, what its effect is supposed to be.” (IP8, 174) She advocates a female quota and finds laws important that try to achieve changes. Quite similar another woman says that she finds it especially important that university structures and learning contents are changed. Another woman is of the opinion that also the boys need more support in natural sciences and technology. Two women think that the launching of women’s networks for supporting females in technology and natural sciences is especially effective.

## **4. Discussion**

All the interviewees are highly qualified and very competent women. Half of the women manage to bring up children and to reconcile family with career without feeling too stressed. Among the other women who do not yet have children, most of which are in a qualifying phase (first or second thesis), all wish to have children and a family later. An advantage for the compatibility of family and career among the women with children is firstly their permanent position (four of them are a professor), secondly the support by their husbands who all are free-lancers or teachers and therefore flexible in work time and work place. It is remarkable that all the women (except one) have or had a father who is either involved in technology or science as a university graduate or is working as a craftsman. All interviewees report that their own interest in technology and science was initiated by their father. This result corresponds with other studies investigating the question of compatibility of professional interests between parents and children (cf. Langmeyer, Tarnai & Bergmann, 2009).

But it would be wrong to conclude from this result that only fathers can evoke a technical interest in their daughters. The women of our sample whose mothers also were university graduates tell us that their interest was initiated by their mothers too; for one woman whose mother taught mathematics and physics her mother was her great ideal. All the other women had mothers who did not have any further education and who mainly were housewives. However, even a grandmother who, without having some special training, stimulated the curiosity of her grandchild is mentioned as initiating the scientific interest in her granddaughter.

None of the interviewees say that her interest in science or technology was in any way evoked in kindergarten or at primary school. This most likely still mirrors the present situation at these institutions.

It is not surprising that the interviewees report about the support of their interests at the gymnasium in very different ways. It seems to be strongly depending on the abilities and the motivation of the teachers whether there is support or not. There are also differing statements about the support during academic courses. Probably there as well it is depending on the personality of a university teacher whether they are perceived as supporting or restrictive. Insofar as the women of our sample felt disadvantaged by their teachers only derogative verbal utterances are recalled, so one can assume that there were no extreme restrictions.

It is striking that in the reports about the vocational career (after the first university degree) the women in this sample only experienced support anymore. Women whose high qualification is acknowledged seem to have no problems in this professional domain. Maybe that women who did not experience support did not "survive". On the other hand, the negative report about practical work in the industries is remarkable. One may conclude that the situation of women is very different, depending on the special place and the environment of their work.

The statements of the interviewed women show that the interest in technology and science is evoked in early to middle childhood. In this sample this interest was exceptionally supported by the family. When thinking about educational interventions here, one may conclude that first of all the parents should be informed about their great influence on the development of their children's interests. They should be stimulated to encourage also the girls to do practical work, as e.g. repairing a bicycle or helping with other practical activities in the apartment, the house and the garden.

As not all parents are interested in handicraft or technology, kindergarten and primary school have an important task in this field of action. Teachers must be prepared, much more intensively as it is the case nowadays, to evoke technical and scientific interests in children (especially in the girls).

As the reports about teachers at Gymnasiums and universities show, it would also be reasonable to better equip teachers of these institutions for this task. Finally, from the ambivalent attitude towards support programmes for females one has to conclude that such programmes have to be evaluated critically and to be constantly optimized and analysed (see Sander, 2009).

The results of this pilot study also suggest to systematically having further interviews with homogenous groups of women who work in different scientific or technical professional fields about their biography and their current professional and familiar situation. Thereby, one could gain new insight into the mentioned problems and interrelations and find out about suggestions for supportive interventions.

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## **Is there a relation between horse riding and the desire to become a veterinarian?**

### **1. Introduction**

Many recent studies (Serpell, 2005) have highlighted some factors that influence the career choice of veterinary medicine such as having a good relationship with animals during childhood and adolescence, an interest for animals, owning dogs and/or cats.

It is assumed that other factors contribute to this career choice, especially for girls who are choosing this career more often nowadays. In fact, they represent 70% of the number of students enrolled in veterinarian school classes in France today (Sans & Darré, 2007).

We have already highlighted the socialization of the interest of girls in animals (Fontanini, 2009). Video games and toys portraying (a male or female) veterinarian or relating to the caretaking of animals or involving equestrian riding are in fact mainly directed towards girls (Fontanini, 2008).

It is difficult to estimate the influence of these extracurricular activities for children and adolescents on girls choosing veterinary medicine as a career. However, we can think that they contribute to influencing their professional ideas, encouraging them to decide for careers related to animals, such as a veterinarian especially when (male and female) veterinary students say that the moment of their decision to choose this career (Serpell, 2005) was when they were 8 to 12 years old. This is precisely the age when girls read most novels and magazines and when they play video games.

Horse riding as a leisure activity is becoming predominately female (Tourre-Malen, 2006). Moreover, the class of 2007 at the National Veterinary School of Toulouse in France has found out that amongst the girls at least 60% are riders whereas very few boys practice this sport (Sans & Darré, 2007). We hypothesize that there is a relationship between the career choice of veterinary medicine and equestrian riding as well as the reading of magazines and books related to horses.

For our study, we have distributed a questionnaire to young male and female riders.

## **2. Methodology**

### **2.1 Subjects**

Our sample consists of 192 (179 girls and 13 boys) riders from two riding clubs in the suburbs of Toulouse (France). A questionnaire was distributed in September 2008 in their club before or after a riding lesson. The (male and female) riders were informed of the subject of the survey. They were all volunteers and will remain anonymous.

In the two riding clubs this sport is predominately female as is the case in the rest of France (Tourre-Malen, 2006).

We have a small number of boys which implies for them that the Chi<sup>2</sup> rules do not apply. Therefore, comparisons of the two genders must be considered with caution.

### **2.2 The Survey**

The first questions of the questionnaire refer to the gender and age of the subjects. Both girls and boys were then questioned according to the career that they wish to practice in the future and what interests them in this career. They were then asked if they had other ideas for careers and if so, to name them. Then, we looked at their horse riding by questioning them at what age they began this sport, what they like the most about this activity, the number of times that they ride per week, and if they own a horse. Next, we asked them if they read magazines and novels with stories about horses regularly and if so which ones. Finally, we wanted to know if one or more animals lived with them and if so what animals and if they take care of them regularly (feeding them, walking them, brushing them, playing with them and taking them to the veterinarian's).

## **3. Results**

The girls and boys are divided into two groups, one with children aged 8-12-years and the second one with children aged over 12 years. Both boys and girls usually ride once a week and do not own an horse. Half of them started horse riding between the ages of 6 and 10, a third of them before the age of 6 and the others after the age of 11.

### **3.1 Desired career**

Half of the girls (92/179 or 51.4%) wish to become a veterinarian or to practice a career related to horses or other animals. This is also the case for 5 boys out of 13 (or 38.4%).

In addition, one female rider out of four would like to become a veterinarian (44/179 or 24.6%) and only one male rider out of 13. Female riders seem to be generally more attracted to these professions than male riders. On the other hand, even if these five boys achieve their goals, considering their small number compared to that of girls, it is likely that there will be less boys in this profession than girls.

Very few are without any professional goals (23/179 or 12.8% girls and 2/13 or 15.4% boys). The majority of riders of both genders only have one idea for a career (12/179 or 67% girls and 8/13 or 61% boys).

There are more girls aspiring to the goal of becoming a veterinarian who are between the ages of 8 and 12 (63.7%) than those who are over 12 years old (36.4%). Their ideas of careers with animals or with horses decrease between the two age groups but to a lesser degree (respectively, 58.3% and 41.6%; 52.7% and 44.4%). Their professional perspectives expand after the age of 12, to the caretaking of humans and other careers. With the boys, we observe some stability but the number of subjects is very low. These results coincide with those of Ginzberg (1951): children between the ages of 10-11 are attracted to professions that they dream of. They do not think about the means and ends. When young people are 11 to 17 years old, according to Ginzberg (1951), they ask themselves what they are capable of and what the advantages and drawbacks of each profession are. Thus, at this age, students make choices like trials (Guichard & Huteau, 2001). We can hypothesize that the goal of becoming a veterinarian decreases with age because young people become aware of the demand of higher studies which are necessary to enter this profession. Then both genders can either evaluate themselves closely and believe that they will not be able to aspire to such studies, or give up when faced with their academic results.

In response to the open question "What interests you in this career?" the girls and the boys answer (without specifying the profession) first of all the love of horses (respectively, 24.6% and 30.6%), then the love of animals (respectively 19% and 7.7%) and finally the desire to care for animals (18.4% girls and no boys). The female riders seem to have a very emotional relationship with horses and animals and this can explain their interest in caring for them.

We realize, however, that the girls' arguments are not mentioned in the same proportion by the two age groups. The love of horses and animals is mentioned less after the age of 12. However, the desire to care for humans, to have contact with people and the love of children are much more apparent after the age of 12. The wish to take care of animals and to teach is apparent proportionately in the two age groups. We notice that the love of horses and animals declines between the two age groups which probably explains, at least partially, a decline in their interest in a veterinary career. Their motivations become undoubtedly less emotional, when they still want to still care for animals but also seek human contact.

Table 1: Career interest according to age for girls

Age Career interest	Less than 8 years old		8-12		More than 12 years old		Total	
	Number	%	Number	%	Number	%	Number	%
No answer	0	0	11	68,8	5	31,3	16	100
Love of horses	1	2,3	26	59,1	17	38,6	44	100
Love of animals	0	0	20	58,8	14	41,2	34	100
Desire to care for humans	0	0	1	12,5	7	87,5	8	100
Desire to care for animals	0	0	17	51,5	16	48,5	33	100
Contact with people	1	7,7	1	7,7	11	84,6	13	100
Love of children	0	0	1	14,3	6	85,7	7	100
Desire to teach	0	0	3	50	3	50	6	100
Doesn't know	0	0	5	41,7	7	58,3	12	100
Other	1	2,2	14	31,1	30	66,7	45	100
Total	3	1,7	99	46,4	116	52	218	100

Chi<sup>2</sup>=32,21, significant, ddl=18; P value=97,92%

The figures in the table are the lined up percentages based on 179 observations.

The table is based on the stratum of the population of « girls ».

We were not able to interpret the results concerning the boys because of the small number of subjects.

The minority of boy and girl riders, having at least one other idea of a career than the initial one stated, have mostly expressed intentions for professional perspectives related to animals (31 out of 61 ideas for the girls and 3 out of 6 ideas for the boys) such as veterinarian, riding instructor, mounted guard, professional rider, blacksmith farrier. We find a strong attraction to careers that are related to animals.

### 3.2 Horse riding

To the open question: « What do you like most about horse riding? », there were many possible answers, more female riders answered « contact and relationship with the horse » than the male riders (respectively 53/179 or 29.3% and 2/13 or 15.4%). The latter preferred (8/13 or 61.5%) riding horses more than the girls (65/179 or 36%) but mentioned obstacle jumping more rarely (49/179 girls or 27.4% et 1/13 boys or 7.7%). To the same degree both sexes liked taking care of the horses (49/179 girls or 27.4% and 5/13 boys or 38.5%).

It appears that female riders are more sensitive to the relationship with the horse and that they are more specific about what they like about riding horses (no obstacle jumping).

By comparing the results of closed questions concerning the desired career and those of the open question « What do you like the most about horse riding? », we observe that the girls considering the veterinarian profession are those who like the most diverse activities linked to horse riding such as riding, taking care of horses, and the contact/relationship with the horses. Thus there appears to be a relation between enjoying horse riding and the desire to become an animal doctor. We can hypothesize that having a good relationship with horses during childhood and/or adolescence arouses the same professional aspirations as having a positive relationship with animals at the same moment in life (Serpell, 2005).

### 3.3 Reading magazines and books about horses

Girls read many more (115/179 or 64.2%) magazines about horses than boys (5/13 or 38.5%). The magazines most read by female riders who are readers are *Star Horse* (57%) and *Horse Magazine* (44%). Male riders who are readers are mainly interested in *Horse Magazine* (3 out of 4). The magazine *Star Horse* is not directed towards girls but it has all the traditional characteristics: the title is circled in pink and on the inside pink- and purple color-decorations can be found. Over all, it is read by 95% of the girls altogether (Tourre-Malen, 2006).

Girls are also more avid readers of novels with stories about horses (58.1%) than boys (5/13 or 38.5%). Most of the girls and boys read them between the ages of 8 and 12 and their favorite book is *The Saddle Club*.

When comparing the question results regarding considered professions with those of magazines read, and then novels, we notice once again that it is the

female riders (readers) aspiring to become a veterinarian that read magazines about horses most (20.1%), followed by those that aspire to a career related to horses (15.6%) and animals (5.6%). The same applies for the male riders (readers) aspiring to a career with horses and animals (respectively 2 out of 5 and 1 out of 5).

The same observations were made for books: 16.8% of female readers want to become an animal doctor; 15.1% want a career related to horses and 4.1% related to animals. This is true for boys, too: amongst the readers, 2 out of 5 read books about horses and 1 out of 5 books about animals.

It appears that the female riders and to a lesser extent the male riders, who wish to practice the profession of veterinarian or one related to animals and/or horses are particularly interested in articles and in books on horses.

### **3.4 Pets**

A clear majority of female riders (145/179 or 81%) and male riders (9/13 or 69.2%) live with at least one pet. On average, each girl has in her family environment 1.87 animals and each boy, 1.55. It is mainly dogs and cats followed by rabbits, guinea pigs, fish, rats, birds, tortoises.

Riders of both genders live with more pets than the average French person, 52% of households have at least one pet (Tourre-Malen, 2006). Moreover, these girls and boys confirm taking care of them. Both girls and boys feed them, walk them regularly and take them to the veterinarian's. Girls seem to play more with their animals. It is necessary to be careful when making these statements that may not completely reflect reality. Daily care of pets follows a routine and so may not be exclusively carried out by the young subjects but also by other members of their families.

## **4. Discussion**

It is obviously difficult to assess the impact of horse riding and the reading of magazines and novels about horses during childhood and adolescence on leading young people to choosing the career of veterinary medicine or others related to animals/horses. However, we can hypothesize that these factors influence them towards these professions.

Half of the female riders wish to practice a profession related to animals or veterinary medicine; this is the case for two out of five male riders out



of five. The love of horses, animals and the desire to take care of animals are the main motivations for their future career choices. The female riders and to a lesser extent the male riders are very interested in animals and their health. We can assume that having practiced horse riding for a few years has led them to enjoy communicating with the horse and having physical contact when caring for it (brushing its coat and its mane, cleaning its hooves, feeding it). In addition, riding demands “constant attention and care as well as specialized knowledge” (Tourre-Malen, 2006).

We can hypothesize that this habit of regular caretaking of a horse leads a significant proportion of female and male riders to envisage professions which allow them to continue these activities related to horses in a professional setting. Moreover, girls planning on choosing the veterinary profession are those who most appreciate the diverse activities related to riding. Thus, a link exists between enjoying riding and the desire to become a doctor for animals.

Moreover, these female and male riders read magazines and/or novels with horses. They have received in these magazines a lot of information about the various breeds of horses, how to care for them, to ride them, information presenting careers related to horses ... these magazines allow them notably to know more about equines. We realize that the magazines about horses/ponies for children between 3 and 13 years are explicitly directed towards girls (Fontanini, 2010). In fact, we see a large majority of girls in the photos as riders on the covers and/or in the inside of the magazine. Boys are almost completely absent.

Novels with horses and in particular series make the readers – especially female readers, because there are more girls who read this type of literature – relate them with their own experiences in the riding club. For example the series *The Saddle Club* which includes 95 novels is a sort of *female version of the famous five* with a moral suited for today’s youth. Three twelve-year old girls are part of the Pine Hollow Stables equestrian club. They share experiences involving friendship, a love of horses, and a taste for challenges and independence which is stirred up by low blows planned by a fellow rider, who is a pest and a typical example of a spoiled girl.

The reading of these collections and magazines by female riders greatly contributes to familiarizing them with horses/ponies and with the equine world. They can also envisage themselves professionally in careers related to horses such as a riding instructor, a veterinarian for horses, a horse trainer, an ethnologist and a groom because these professions are often practiced by women in these magazines and books.

When looking closely at the youth books and albums edited or reedited in France between 1995 and 2007 (source *Electre*) portraying a (male or female) veterinarian, we have found out that current youth literature for children from ages 6 to 11 presents this profession as being practiced mainly by women.

We have found 32 books for children aged 6 to 12 which portray the veterinary career. Fourteen of them present a story with a female veterinarian and 18 with a male veterinarian, that is a slight male prevalence in this profession.

However, if we look at the collections, the results are the exact opposite, we count 112 stories of female veterinarians in three different collections (*Animal Emergencies*, *The Saddle Club & Sheltie*) and 14 stories with a male veterinarian in the collection (*Horses of Half Moon Ranch*). *Heartland*, a series, is the only one to offer two models to identify with: a male and a female veterinarian. Moreover, two unisex books present this profession (*Veterinarian: a pocket guide & Veterinary Clinic*).

On the other hand, there are no books directed towards children over 12 presenting a male or female veterinarian. Summing up, all the series books and stories, we notice that there are more female veterinarians (157 times out of 225 or 70%). Thus, in reading these books, girls can envisage themselves in this profession which appears as suited to be practiced by women, or even as a feminine career. A school or professional project is generally a projection of a possible self image, a form of identity that we wish to achieve. Girls or boys are attracted to activities that conform to their gender, which will then influence their professional aspirations (Octobre, 2005).

We can judge that the models presented to girls in this literature are positive because they lead them to envisage professions that used to be reserved for men. Thus in a professional domain their range of chances is wider than it was thirty years ago.

Again boys have less identificatory models of professionals working with animals in these books, which is also true in reality because, for example, there are more and more female veterinarians. This lack of models may result in boys tending to turn away from these professions.

We may also assume that the fact of having met a (male or female) veterinarian and seeing him or her work in a riding club or in a clinic where their pet is treated may evoke a vocation for this profession in children. Moreover, the love of horses and animals is an additional element in wishing to care for them and to avoid their suffering.

We may also wonder why there are so many more female horse riders compared to male riders. We cannot consider that men are abandoning this sport because their total number is constant (Tourre-Malen, 2006). However, the large increase of horse riders for the last thirty years is mainly due to women. Moreover, their share continues to rise (Tourre-Malen, 2006).

Many factors have encouraged and still encourage the interest of women in this sport (Tourre-Malen, 2006). Firstly, for the last thirty years, women especially those with a higher socio-economic status have practiced sports more and more. Horse riding has attracted this part of the female population because it demands a higher income. This sport is considered to emphasize the femininity of the female rider by the positions and clothes used. Female riders are seen as graceful and elegant. Moreover, training is seen as a feminine specialty because “the movements of a horse’s body and femininity seem to match so harmoniously” (Tourre-Malen, 2006, p. 77). In addition, according to Octobre (2005, p. 3), when we ask the parents what they would like their daughters and/or their sons to practice as an activity, we learn that for girls they seek either individual sport activities rather than collective sports, or sports that “develop an aesthetic approach (...) or are related to animals, like horse riding”.

All of these factors which lead girls to practice this sport may dissuade some boys. They prefer to consider sports that promote masculinity. Moreover, they fear as boys they may be isolated in the riding clubs.

Of course, it is not only because there are less boys who ride on horseback nowadays that the veterinary career is becoming more predominantly feminine. The socialization based higher interest of girls for the animal world is another explanatory factor. In addition, when studying children’s ideas about their future professions when they are 9-11 years old (Octobre, 2005), we realize that the girls regard this career more than boys as one for both genders whereas boys regard it as a profession for women. If this profession is considered more as a feminine profession by boys, this explains, at least partly, the fact they turn away from it. However, the feminine character of the veterinary profession will encourage the orientation of girls to be directed to this field as it appears to comply with their gender.

We can also suggest that the veterinary career, especially with regard to the treatment of dogs, may be regarded as suitable for women because it is considered to have qualities said to be feminine such as being gentle, patient, and ready to listen to the “patients” ...

Finally, it mustn't be forgotten that it is their achievement in studies that allows girls to choose the veterinary field after secondary studies which are very selective in France. In fact, entering a preparatory scientific program including biology, chemistry, physics, life and earth science is possible only with a very solid academic record. This preparatory program lasts two years the four veterinary schools and even a third year after failing in a very selective entrance exam to (13% succeed on average over the past few years).

## 5. Conclusion

Following these results, a relation seems to appear between the aspiration of female riders to practice a veterinary career and horse riding, the reading of magazines and novels with equines, also for professions dealing with horses/animals and to a lesser extent also for male riders.

Having a good relationship with horses during childhood and/or adolescence very likely favors the same professional aspirations as having a positive relationship with animals at the same period of life (Serpell, 2005).

However, horse riding conveys more than just a good relationship with horses. It leads to the caring of the animal which can create a professional vocation oriented towards animal or horse care.

It can be imagined that riding clubs are true breeding grounds for future veterinarians. Considering that for the past twenty years there have been more girls than boys that ride, it is logical to ascertain that girls are more attracted to the veterinary profession.

If we add to these results, the socialized interest of girls towards in animals caused by their toys, games, magazines, and books, there are reasons to believe that there will be more and more women signing up for veterinary school entrance exams.

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## **Gender differences in Motivation to Lead in Germany**

### **1. Introduction**

Female managers in Germany are still widely underrepresented both in the private and in the public sector. Their underrepresentation is especially striking in top leadership positions and in large companies. The slow progress in the advancement of female managers has led to an ongoing debate in the political arena and to the governmental funding of research programs to analyse the reasons.<sup>1</sup> Despite the publically displayed interest to increase the number of female managers, hardly any improvements have been recorded since 2004 (Kohaut & Möller, 2010).

Aside from this mere quantitative imbalance which reflects unequal opportunities for men and women, there are also qualitative reasons, which underline the need for more female managers. Three of the most compelling reasons will be described here. First, recent studies bring forth evidence that a certain minimum of women on a company's management board goes along with greater organizational performance (McKinsey & Company, 2007). Second, in the context of organizational decision making, women have been shown not only to hold stronger ethical beliefs compared to men (Eagly, Diekmann, Johannesen-Schmidt & Koenig, 2004), they also act with more consideration for others and show less toleration of rule breaking (Eagly, 2005; Franke, Crown & Spake, 1997). And third, women prefer a transformational leadership style over transactional or laissez-faire leadership (Eagly, Johannesen-Schmidt & van Engen, 2003; Schyns, von Elverfeldt & Felfe, 2008). Transformational leaders have been shown to foster employee's commitment and job performance (Felfe, 2006a, 2006b). As can be seen from these empirical findings, the neglect of the leadership potential of women goes along with the loss of various benefits regarding economic success and business ethics.

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## **2. Theoretical background: Motivation to Lead as a precondition for leadership**

Regardless of gender issues, demographic changes are already leading up to a „war for talent“ (Michaels, Handfield-Jones & Axelrod, 2001). Clearly, the identification and recruitment of high potentials especially among young women has become a crucial task for human resources (HR) management. Therefore, it seems necessary to come to a better understanding of the emergence of leadership careers. Why does one person get to the top while another one does not? As with any accomplishment, three conditions need to be factored in: favourable contextual factors, relevant skills, and high motivation (Felfe, 2009). The role of motivation has been widely neglected in the field of leadership research. It therefore remains an open question as to what extend motivational processes facilitate or inhibit leadership careers, especially for women. With regard to any goal, a high motivation always leads to more goal orientation, higher effort, and stronger persistence, especially when set-backs are experienced. This means on the one hand that without a high level of motivation, good opportunities may remain untaken. On the other hand, a high motivation may help to overcome difficult contextual factors and obstacles. This line of reasoning is not far-fetched if you will look at the example of one of the interview partners in this study, Yvonne Zander<sup>2</sup>, who quit school and left home when she was 15, receiving no financial or moral support from her family. Today, besides other projects, she is the founder and director of an employment agency. She describes herself as always having been highly motivated to be independent and to do something worthwhile. Mrs. Zander's example shows that, besides the necessary career opportunities and professional skills of a person, motivation presents an essential precondition for high accomplishments. Therefore, it is reasonable to assume that specifically Motivation to Lead (MTL) plays a central role in the assumption of leadership positions. Merely referring to an unfavourable context or even reverting to the stereotype that women simply do not have the skills to lead does not yield sufficient explanations for women's underrepresentation in leadership positions.

MTL is defined as the individual preference and striving for leadership (Felfe, Elprana, Gatzka & Stiehl, released in 2012). In spite of the implications MTL seems to have for the assumption of leadership careers, leadership research has given the concept of MTL little attention so far. First attempts to bring MTL into consideration were undertaken by McClelland and Boyatzis, who postulated the “Leadership Motive Pattern” (LMP) in 1982.

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2 Names and places have been changed in order to help preserve anonymity.



Since then, the interest in MTL has widely diminished and only picked up again in recent years. It was only in 2001, when Chan and Drasgow developed a new concept of MTL differentiating between different reasons a person can have to take over a leadership position. Even though both theories have intriguing implications for the understanding of MTL, their conceptual differences underline the need for an integrative theory and for a deeper understanding of the role of MTL especially for women (cf. Felfe & Gatzka, released in 2012).

### **3. A Germany-wide interview study on Motivation to Lead – Research questions**

In order to come to a closer understanding of MTL and its meaning for women's careers in leadership, an interview study was conducted with 50 male and female leadership experts. Four central questions will be discussed below.

1. How to reach a leadership position – How relevant are Motivation to Lead, contextual factors, and personal skills?
2. On the way to the top – What precedes a high Motivation to Lead?
3. Motivation to Lead – Does gender matter?
4. Motivational barriers – What keeps women from taking over leadership positions?

Based on the results of this interview study and former MTL research by McClelland and Boyatzis (1982) and Chan and Drasgow (2001), the first goal was to develop the framework for a comprehensive and integrative model of MTL which gives special attention to female attributes of leadership. Second, in accordance with this model, the goal was to develop a gender sensitive instrument to measure MTL (cf. Felfe et al., 2012). The gender sensitive measurement of MTL should significantly further the research on new ways to foster female managers.

### **4. Procedure and method**

A number of 50 high level experts from all over Germany were interviewed in order to deepen the understanding of the overall construct of MTL and its relevance for management careers, especially for women. The sample consisted of 30 male and 20 female leadership experts from six German federal

states (Bavaria, Berlin, Brandenburg, Lower Saxony, North Rhine-Westphalia and Rhineland-Palatinate), including managers, directors, HR consultants and HR managers, representing a wide range of organizations from small start-up enterprises to long-established large companies. Hierarchy levels reached from team leader to director positions. Both private (trade, industry, finance, law, human resources) and public sector (administration, science, education, traffic, clinic) were represented in the study.

The interview was semi-structured, containing both open-ended questions and ratings on 5-point-likert-scales. The managers were both asked about their personal opinion and their own development as well as about their opinion on managers in general. The interview was divided into seven sections: 1) description of the company, job position and leadership tasks, 2) meaning and relevance of MTL for career success, 3) gender differences, 4) personal reasons for taking over leadership positions, 5) retrospective on leadership-like experiences and early cues of MTL, 6) ways to identify MTL, 7) demographic information. On average, one interview took approximately 70 minutes. All participants were asked permission to audiotape the interview. All audiotapes were transcribed and then coded according to Mayring (2009).

## **5. Results of the interview study**

### **5.1 How to reach a leadership position – How relevant are Motivation to Lead, contextual factors, and personal skills?**

As already mentioned, there are three main conditions for high accomplishments – motivation, contextual factors, and skills (Felfe, 2009). Specifically with regard to the assumption of leadership positions, the managers were asked about their opinion on the relevance of each of these factors (see figure 1). A remarkable majority of 68% stated that MTL is a key player in a successful leadership career. Male and female managers equally agreed to this.

“The Motivation to Lead is very important, because that is your source of energy. You always need to overcome barriers and there are always people who say, ‘that’s not possible, we can’t do it’. And then there are those who are driven by desire, by passion. These people just get rid of the barriers.” (male, 51-60<sup>3</sup>)

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3 Age was assessed in categories in order to help preserve anonymity.

As this quote already suggests, the role of the contextual factors was generally judged to be less important than the personal factors, such as skills. Generally asked for the relevance of external and internal factors, only 58% of the managers stated that contextual factors play an important role in the emergence of a leadership career, while 72% of the managers emphasized the meaning of factors within the person. In order to reach a leadership position, the person skills and characteristics someone brings to the table, thus seem to be highly relevant. This matches the first result showing that the majority of the managers agree to the relevance of MTL, which is also a factor within the person.

“I think that personal characteristics are very important, because contextual factors don’t need to be perfect. If you have the drive to do it, you can reach the goal of getting into such a position and also owning that position. From there, you can even change the contextual factors. But first, you need motivation, you need to want it for yourself.” (male, 51-60)

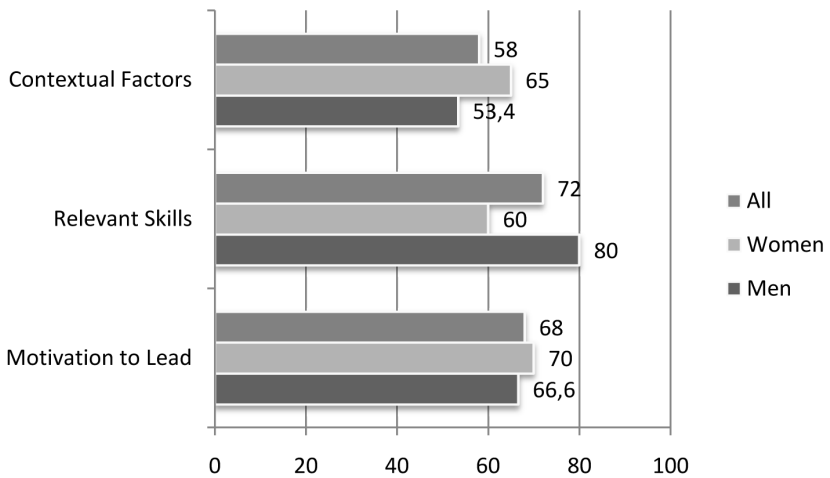


Figure 1: Relevant factors for reaching a leadership position (agreement in %)

The findings on personal characteristics versus contextual factors exposed an interesting and significant gender difference. Whereas 65% of all women (vs. 53% of the men) assigned more meaning to the contextual factors, 80% of all men (vs. 60% of the women) pointed out the significant role of the personal characteristics. The managers’ comments support the general per-

ception that men have more faith in their personal attributes, no matter how difficult the contextual factors are.

“I didn’t care about the contextual factors, I just said to myself, I want to do this now. This is my chance, I’m doing it. I didn’t think about the conditions, I just made an emotional decision.” (male, 51-60)

“Men just do things, not necessarily, because they have the greatest expertise, but because they were brought up this way.” (female, 41-50)

There is a large body of research which shows that external attribution of success occurs more often in women than in men (e.g. Deaux, 1976). This is in accordance with the findings of the current study. Women rather attribute a successful leadership career to external circumstances than to their personal skills. The fact that women are still more often confronted with difficult contextual factors, might add to this effect. 70% of the female managers felt that the circumstances for reaching a leadership position were still more difficult for women than for men. The women mainly criticized the incompatibility of work and family demands on the one hand and the persisting disapproval of female leaders on the other hand.

“A few managers still had this idea that women belong in the kitchen and not in the work place. I will never forget how one of the older managers came up to me one day, and said to me ‘Mrs. Geissler, you almost think like a man’. That was a huge compliment to him.” (female, 41-50)

*Gender fact no. 1:* Both women and men emphasize the importance of MTL. However, women tend to depend more on beneficial surroundings, making themselves more vulnerable to difficult contextual factors than men. This finding is in accordance with the fact that women show a stronger external attribution of success, while men rather ascribe success to their own personal characteristics. The majority of the women still feel disadvantaged in the role of the female manager.

## **5.2 On the way to the top – What precedes a high Motivation to Lead?**

The outstanding relevance of MTL as a precondition for a leadership career leads to the question of how and when MTL develops. The experts were therefore asked to recall any leadership experiences in the different stages of their life. Having experienced the role of a leader, regardless of the context,

might facilitate the integration of the leader role into the self-concept and might also make the assumption of leadership positions seem more attainable and more attractive. According to the managers' memories, a high MTL appears to show fairly early in age. Both male and female managers, who described themselves as highly motivated to lead, also reported more leadership-like experiences in their youth than those managers who described their MTL to be rather low. While most experiences were reported from teenage years, some of the managers' memories go back to childhood. The experiences ranged from being the group leader in girl scouts as a child to founding a workers' committee in a factory at the age of 18. Overall, men reported slightly more leadership-like tasks in their past than women.

"Even when I was a child, I liked to take over the role of the leader."  
(male, 60-70)

"In school, when I was a girl, I was the head of a boys' group, a gang. I did all kinds of things, school newspaper, school representative, class representative. And I always conducted the school orchestra." (female, 51-60)

"I had my own sports club, and I was the president." (male, 41-50)

Of course, taking over responsible tasks as a child is not a necessary precondition for becoming a leader. Nevertheless, the more experiences managers could recall the higher was their self-assessed MTL ( $r=.32$ ,  $p < .05$ ). Especially experiences in childhood ( $r=.42$ ,  $p < .05$ ) appeared to be meaningful to the development of a high MTL. The fact that men generally recalled more leadership-like experiences in their past, matches the finding that men also agreed more strongly that they had always known they wanted to "fly at a higher game" someday.

"Yes, I knew it relatively early. It was already in my professional training when I realized that I needed something else. I needed to get into a leadership position." (male, 41-50)

Overall, however, only 25% of all male and female managers agreed to this self-perception. Interestingly, when asked how their family and close friends perceived them, more than 50% agreed that others had already early predicted they would "fly at a higher game" one day.

"Nobody doubted that I would be 'a somebody' someday." (female, 41-50)

"Yes, I think so. Especially my friends from school, they would have said so." (female, 41-50)

An interesting gender difference could be observed when the managers' self-perception and their perception by others were compared. While slightly more men agreed they had somehow always known they would be "a somebody" someday, the women were slightly more often told the same thing by others. Knowing that family and friends believe in you can be seen as a form of social reinforcement, as well. It might therefore be another important key player in establishing MTL especially in women.

*Gender fact no. 2:* Leadership-like experiences correlate with higher MTL. Men report slightly more experiences than women. Further on, the findings point to a high relevance of external reinforcement by the social context, especially for women.

In the search for other factors, which might support the early development of MTL, further analyses discovered the remarkable meaning of role models. Managers who could recall having had role models in regard to their careers also reported a slightly higher MTL ( $r=.24$ , n.s.). However, a closer look shows that this correlation is first and foremost explained by the high relevance of role models for women's MTL ( $r=.63$ ,  $p < .01$ ), but not for men's MTL ( $r = -.09$ , n.s.; see figure 2).

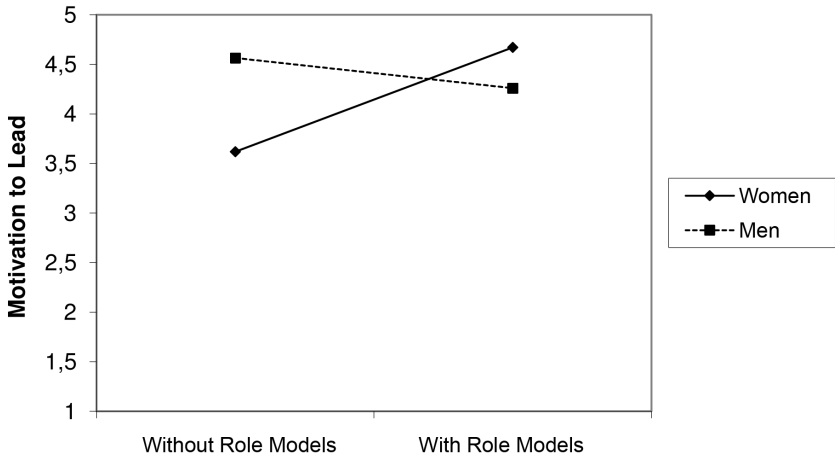


Figure 2: Women's MTL correlates strongly with the availability of role models, while role models have no significant relevance to men's MTL.

In addition, the gender of the role model seemed to play a crucial role to the women's MTL. Those women, who only had female role models and no male role models, were also more likely to describe an active rather than a passive career approach ( $r=.54$ ,  $p < .05$ ).

"My aunts, my mother, my grandmother, they were all self-employed. So I knew what that was like ... But in general, if you look back ten years, there weren't many female role models. When women hit the glass ceiling, they decided now would be a good time to have children. Because they were scared, they didn't know what to do." (female, 41-50)

"No, I didn't really have a role model ... I kind of missed that sometimes. It was more like being thrown in at the deep end, trying to keep my head above the water." (female, 41-50)

Amazingly, opposite effects were found for female managers who could exclusively recall male role models. Male role models were in no positive relation with an active career approach ( $r= -.13$ , n.s.). And moreover, women with only male role models reported a slightly lower MTL, they tended to decline more often always having known they would someday "fly at a higher game", and they had generally collected less experiences with leadership tasks ( $r= -.45$ ,  $p < .05$ ). These findings imply that male role models have a detrimental effect on women's MTL. According to Gender Role Theory (Eagly & Karau, 2002), a reason for this might be that male role models suggest that leaders are typically male and therefore a leadership position seems neither adequate nor attainable to women. The opposite is the case if women have female role models.

Surprisingly, male managers did not seem to be influenced by role models at all. Their MTL was in no significant relation with having role models, no matter of which gender. This result, too, underlines the independence of men's motivation from encouragement by others. Women, on the other hand, again turned out to be more dependent on external factors, in this case, specifically on female role models.

*Gender fact no. 3:* Female role models seem to foster women's MTL while male role models seem to have a detrimental effect on their MTL. Again, men's MTL seems to be independent from reinforcement by others, no matter of which gender.

### 5.3 Motivation to Lead – Does gender matter?

Regardless of their own gender, more than half of the experts (54%) believed, there is an at least medium-sized gender difference in MTL, meaning that women have less motivation than men. And more than 50% of the managers believed that women needed a higher MTL than men in order to get into leadership positions.

“I think women need more persistence and stamina, because they experience more hostility. They get more questions like ‘Can you do that – being a woman?’ Their motivation has to be strong enough to overcome these barriers.” (female, 41-50)

“Women certainly have to prove themselves more.” (male, 51-60)

When asked for a self-assessment, approximately 50% of the female and 60% of the male managers ascribed themselves a very high MTL, displaying the expected gender difference. But while this difference yielded no statistical significance, men did, on a marginal significance level, attach a higher personal relevance to actually occupying a leadership position ( $t_{27} = 1.85$ ,  $p < .10$ ). When they were asked „How important is your current leadership position to yourself?”, 47% of all male leaders said it was very important to them. The same was true for only 30% of all female managers.

“I don’t know how I’d feel if I were rid of my management position tomorrow. Probably not so good ... I would lose many things that define me, that motivate me, drive me.” (male, 51-60)

“I ask myself sometimes, why do I do this to myself? Is this really necessary? I’d rather be a correspondent in Washington.” (female, 41-50)

How do these two results fit together? In spite of men and women describing themselves to be at least moderately motivated to lead, women seem to find it less important than men to actually be in a leadership position. This might mean those women who actually have MTL do not see themselves as a leader per se and do not necessarily demand managerial responsibility. This seems to be another key element in the search for potential female leaders. The fact that their MTL seems to be less consequential for their actual behaviour might be caused by inconsistent motives – on the one hand, women may want to have managerial responsibility, on the other hand, a choice for a leadership career might just come with too many negative side effects. Such barriers might cover up their motivation and lead to the avoidance of leadership.



“I think, you need to identify what it is that holds women back, what covers up their motivation, identify those who only need a little support, a little reinforcement, a little stimulation. If the motivation is strong enough, you have enough energy to overcome these obstacles.”  
(female, 41-50)

In other words, there might be a significant amount of women who might in general like being in charge and being a leader, but who are at the same time too concerned with possible disadvantages and losses associated with a leadership position.

*Gender fact no. 4:* A high MTL is even more relevant for women than for men if they want to assume a leadership position. However, women are generally perceived to be less motivated to lead than men. In addition, women seem to be less insistent with regard to their managerial positions, even though both male and female managers ascribe themselves an at least moderate MTL. This speaks for a stronger inconsistency in women's MTL: Even though they might like to be in charge, they might tend to avoid leadership positions because they are too concerned about possible disadvantages.

#### **5.4 Motivational barriers – What keeps women from taking over leadership positions?**

The findings on women's external attribution of success, their expectation of having to prove themselves and their inconsistent motives of both wanting and avoiding leadership already suggest that women's motive constellation is rather disadvantageous. In order to find out more specific motivational barriers, the managers were asked to think of reasons which speak against a career in leadership and to describe persons whom they suppose not to have any MTL at all. This way, three main motivational barriers were identified. Furthermore, they were described to put the brakes especially on women's MTL.

The first motivational barrier is the loss of expertise a person has to accept when he or she decides for a leadership career. Once in a leadership position, the managers have to spend a great part of their time away from their original profession. Not being able to apply your professional knowledge anymore seems to be an important factor which speaks against the assumption of leadership roles.

“You should never forget that about leadership: the ladder up also means giving up the satisfaction of knowing the second law of thermodynamics.” (male, 51-60)

“Someone who is not motivated to lead ... would be very task-oriented. There are so many really interesting jobs, and some people prefer to work on the essentials. If I had to choose, I would prefer to work on the essentials, too, rather than being in a leadership position.” (female, 41-50)

The second major barrier was the enormous work load many management positions come with. The fact that managers often have to make personal sacrifices for their job, results in the so-called work-life-conflict. While persons with less MTL might not be willing to commit themselves to these demands, persons with high MTL might see their profession as a more essential part of their life and might be willing to invest more time on it than others.

“Some people live more in the ‘at-home-world’ than in the ‘job-world’. Their job is their job. If you don’t have passion for your work then you can’t motivate yourself to get to the next level. That would be excruciating.” (male, 21-30)

“You don’t have a regular 9-to-5 job. You go far beyond that. They always need to be able to get in touch with you. And you have 7-day-weeks, too, because you take your work home on the weekends.” (female, 31-40)

As already mentioned, the majority of the female managers feel disadvantaged compared to men, one of the reasons being the work-life-conflict, which is often expressed as a perceived incompatibility of work and family demands. The following quotes show which different coping strategies female and male managers used in order to “have it all”.

“My husband’s generation still thinks the man brings home the bacon. He never supported me in any way. He said, ‘You want it, you do it. But without me.’ When I look back now, 30 years later, I ask myself, how did I do it? But I got my way. I did it anyway.” (female, 41-50)

“In the past 30 years, I have never had to watch the time when there was a late night meeting. My wife had to set many things aside all these years...” (male, 51-60)

“My husband and I switched roles. He was the only man in kindergarten. My career wouldn’t have been possible, otherwise. Either you are single, or your partner helps out with the children – or you just don’t have children.” (female, 41-50)

“I don’t have a family in the traditional sense. I had a lot of freedom. When others were on their way home, I just got started. I worked very many nights.” (female, 41-50)

The third motivational barrier is the emotional pressure many leadership positions present to the manager. Even though this certainly depends on the job sector, some managers described very harsh working climates, especially when they were high up in the company hierarchy.

“Well, of course it’s a huge difference, if you are the one in charge. You sometimes expose yourself to very negative experiences. I know colleagues who have a great deal of trouble handling this pressure.” (female, 41-50)

High expectations, high responsibilities and negative working climates are examples of what might keep women from leadership positions. Both male and female managers often felt that women have more problems dealing with the pressure of the manager job, because they are much more worrisome than men and more insecure about their qualification.

“Women have more concerns. ‘What could happen? What, if it goes wrong?’ Most women ‘over think’. I always think I will worry about the problems when I have them.” (female, 41-50)

“Men don’t think about it that much. Women go through all sorts of criteria, like ‘why should I be the one?’ And men say, ‘I want to, I know how to, so I ought to!’” (male, 30-40)

*Gender fact no. 5:* Three major barriers could be identified, which put the brakes especially on women’s MTL: the loss of opportunities for applying expert knowledge, the work-life-conflict resulting from a management position and the emotional pressure of many leadership positions.

## **6. Summary and conclusion**

Fifty high level experts from all over Germany were interviewed on their personal understanding of MTL and its meaning for leadership careers especially for women. The results show that the majority of both male and female managers believe in MTL as an important precondition for a successful leadership career. In general, however, men tend to attribute the successful assumption of leadership positions rather to personal characteristics, while women, by contrast, are more likely to attribute to beneficial contex-

tual factors. This is in accordance with other findings on the external attribution of success by women. Most of the female managers also stated that they still felt disadvantaged in the role of the female manager, which might explain the perceived dependency on contextual factors. While women were generally perceived to be less motivated to lead than men, the managers felt that a high MTL is even more important for women than for men if they want to attain managerial responsibility. In addition, female managers do not persist on having a leadership position as much as male managers do, even though both male and female managers in the study ascribed themselves an at least moderate MTL. This might be interpreted as a stronger inconsistency in women's MTL and underlines the need to find ways to reduce motivational barriers and concerns about leadership, such as the perceived work-life-conflict and the emotional pressure which often go along with management positions.

Three possible ways to foster MTL and reduce motivational barriers especially in women were indicated by the interviews. MTL was for both genders significantly correlated with leadership-like experiences in the past, especially in childhood and youth. But men reported slightly more experiences than women, implying that the enforcement of early experiences with leadership might be an effective way to foster the development of women's MTL. Managers with high self-rated MTL also recalled more often that their close friends and family had recognized their leadership potential relatively early. Further analyses implied that this effect might be especially relevant to women's MTL, underlining the meaning of continuous social support and reinforcement. This assumption is further supported by the fact that the female managers' MTL was positively correlated with having female role models in regard to their career. Measures to increase the visibility of successful female managers therefore seem to be very promising.

## **7. Outlook**

It is an important finding that women's MTL might be lower or might be covered up by motivational barriers in contrast to men's MTL. The rather inconsistent MTL points out the need to find ways to foster women's MTL on the one hand and to reduce motivational barriers on the other hand. While contextual factors undoubtedly play a significant role in diminishing women's MTL, women's fears and worries concerning their qualifications and their acceptance as a leader may be efficiently encountered with the guidance and advice of mentors or other forms of informal and emotional support. Specific measures pointed out by this study include enhancing the vis-

ibility of relevant female role models, social support and reinforcement, as well as urging young women to make their first experiences with leadership as early as possible. This way, they would learn that leadership is an acceptable and attractive future vision for women, too. They would also have the opportunity to find out about the advantages and disadvantages of leadership for themselves and possibly integrate the role of a leader into their self-concept.

The early and gender sensitive diagnosis of MTL should help to identify specific motivational barriers at an early career stage, thus leading the way to systematic individual coaching and training measures. Fear factors and motivational barriers were therefore integrated into the Hamburg Motivation to Lead Inventory (Felfe et al., 2012). It allows for a differentiated identification of inconsistent motive constellations, which facilitates identification of those women who both have a high MTL and at the same time fear the negative sides of leadership. The instrument should further research on new ways to unclench women's MTL, presenting an important starting point for individual approaches to foster female managers.

Looking at the women in this interview study, who are successful leaders, gives reason to argue that those women, who do overcome the various barriers and who do get "to the top", have developed a high and unambiguous MTL. However, we argue that also persons with a less pronounced motivational profile have a considerable chance to develop their MTL and to get into leadership positions – if they learn how to cope with unnecessary worries and doubts in regard of leadership careers. One could hypothesize that inside the large remaining pool of female employees without managerial responsibility, there must be a considerable number of women with an inconsistent MTL. These women might not actively strive for leadership, because they might be frightened off by the potential loss of expertise or the risk of failure associated with leadership careers. Identifying these women means being able to look for individual ways to release their MTL and might be a significant step towards the advancement of women in leadership positions everywhere.

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## Leadership styles of women in Bulgaria

### 1. Introduction

Does gender matter when it comes to leadership? Is there a difference between male and female leaders? If yes, what are the unique qualities of female leadership that the most effective female leaders possess, and are those qualities unique to women?

In 2005, a year-long study conducted by Caliper, a Princeton (New Jersey)-based management consulting firm, and Aurora, a London-based organisation that advances women, identified a number of characteristics that distinguish female leaders from men, when it comes to qualities of leadership:

*“Women leaders are more assertive and persuasive, have a stronger need to get things done and are more willing to take risks than male leaders... Women leaders were also found to be more empathetic and flexible, as well as stronger in interpersonal skills than their male counterparts... enabl[ing] them to read situations accurately and take information in from all sides. ... These women leaders are able to bring others around to their point of view ... because they genuinely understand and care about where others are coming from ... so that the people they are leading feel more understood, supported and valued.”* (Caliper, 2005)

Research has been conducted since the 1970s to determine, whether leadership styles differ by gender, and the findings have been mixed. A number of studies have described men as having a tendency for transactional leadership, whereas women have been portrayed as more transformational (Bass, 1998; Bass, Avolio & Atwater, 1996; Druskat, 1994; Giovanonni, 2001; Maher, 1997; Rosenbusch & Townsend, 2004). Male leaders were more likely to display transactional leadership through the use of management-by-exception (active and passive), while women leaders engaged in more contingent reward behaviour (Eagly, Johannesen-Schmidt & van Engen, 2003).

Women leaders were found to exhibit transformational leadership through individualised consideration more frequently than men did. Bycio, Hackett & Allen (1995); Maher (1997), and Komives (1991) reported that female managers rated themselves significantly higher for intellectual stimulation than their male counterparts did. In contrast, other scholars have found out no connection between leadership style and gender. For example, D’Ambrosio

(2000) and Komives found out no gender differences in transformational and transactional leadership style ratings. Further, Bass (1998) found out no difference between male and female leaders regarding contingent reward and laissez-faire leadership style. Alban-Metcalf and Alimo-Metcalf (2000) have developed a transformational leadership questionnaire (TLQ) and summarise some of their research findings as follows: generally women have been found to construe leadership more in transformational forms and men in more transactional terms. Generally women are more likely to describe their leadership style as transformational and men tend to label their leadership style as transactional. Furthermore, women are in general more likely to be described by their direct reports as adopting a transformational style and men are more likely to be described as adopting a transactional style.

## **2. A need for further empirical research in Bulgaria**

Evidently, over the past decade international leadership and leadership development research have been developed by working on leadership behaviour (Kakabadse, McMahan & Myers, 1995), but, what is still lacking, is research addressing issues of leadership in countries facing the drastic challenges of political and economic transformations and the adjustment to a market-driven, competitive world economy (Ardichvili & Gasparishvili, 2001). Though Bulgaria was rated amongst the first places in managerial positions, taken by women, according to Eurostat, some experts in the field also defend the idea that women are underrated.

In this context, there is a great need for further empirical research, as well as for using more rigorous methodology to investigate the dynamic changes taking place in Bulgarian companies. Leadership research holds a great promise to bridge the gap between the postulates of Western management and organisational behaviour theories and the requirements of business practice in Bulgaria. Further empirical tests of Western leadership concepts and the use of measurement techniques, which take the specificity of cognitive abilities of Bulgarian managers into consideration, appear to offer an opportunity to find effective ways to improve the organisational performance of Bulgarian companies (Elenkov, 2002).

Furthermore, the most important aspect of this issue – gender differences in leadership styles, has not been studied properly yet. *For this reason, the present empirical research is focused on the specific characteristics of this issue, by investigating the leadership style of male and female managers, in the Bulgarian society.*



## **2.1 Some statistics and figures describing the situation of Bulgarian women in the society**

What is the percentage of women on Bulgarian companies' board of directors? What is the percentage of women in executive roles? Do executive women hold positions in the line (the profit and loss areas of the business) or are they clustered in traditionally "female" staff jobs, such as human resources? Do the people in the company include other women as appropriate in meetings where important decisions are being made? Do women get mentored by senior people to the degree that men do? Do women get assigned to high visibility projects at a rate commensurate to men? Do women get paid as well as men do?

According to the Constitution of the Republic of Bulgaria, the civil, trade and labour legislation, Bulgarian women have the legal right to participate in the economic life in the same way as men (Nikolova, 1994). In 2003, the parliament passed the Law for Protection against discrimination, which says that any form of direct or indirect discrimination on the basis of people's gender, race, nationality, etc. is forbidden. The National Council for Stimulation of Gender Equality (within the authority of Council of Ministers) created bases of a national structure, related to gender equality at the end of 2004. Since 2005, the First National Action Plan for Stimulation of gender equality has been put in practice. Equal opportunities for both genders for having an access to economic activities were guaranteed. The aims of this plan also consist in taking measures for the elimination of gender-role-stereotypes of women and men.

In the recent years, the growing number of women on high organisational levels should be related to the enhancement of their education level (Kotseva, 1996). The censuses of population carried out by the National Statistical Institute in the period from 1946 to 2001 show that the percentage of women with university education has a stable growth and since 1992 it has exceeded that of the men in urban as well as in rural areas (NSI, 2001). A statistical survey for the period from 2002 to 2006 determines that the part of the women with university education continues to be higher than that of men. According to the information for 2007, women are 59.07% and men 40.93% of the university graduates in the country (NSI, 2008). Presented data reveals that nowadays the intellectual potential of women in Bulgaria could satisfy requisites of the labour market, including the high specific requirements for a managerial position.

The participation of both genders in the labour force in Bulgaria is relatively balanced. Data for 2007 show that 46.77% of the employees are women and 53.23% are men (NSI, 2008).

If we try to calculate the percentage of women in leadership positions in Bulgaria and compare it with the proportion of women in leadership positions in Europe the picture is completely different. The situation varies significantly from one European country to the other: in Norway, women hold more than 32% of top executive jobs, against just 1% in Luxembourg. Generally speaking it can be concluded that gender diversity is stronger in Northern and Eastern Europe including Bulgaria than in the South or in Germany (McKinsey & Company, 2007).

## 2.2 Some other facts for justification

In 2009, the top two levels of the civil service in each of the EU Member States comprised 68% men and 32% women. That means that there are two men for every woman in the two top levels of national administrations. In fact, at the most senior level women are even more outnumbered, with three men for every woman (74% and 26% respectively). For example, men account for more than four out of five senior civil servants in Belgium, Germany, Ireland, and Cyprus and more than nine out of ten in Luxembourg (6%). In Turkey, men have such an overwhelming hold on decision-making power that they account for 97% of the two highest levels of administrators in government departments, though this is at least an improvement compared to previous years when there were no women at all.

Nevertheless, in some countries the gender balance in the top tiers of the civil service is very good. The top five are Bulgaria with 51%, Slovenia with 48%, Latvia with 46%, Hungary with 44%, and Slovakia with 44%. In contrast you can find, for example Germany with 14% at a very low rate, the European Commission, which is a bit better, but still not very good with 18%, and in France, you have at least 24%. *So the question is: How can those numbers be explained?*

In Bulgaria, women generally enjoy the same liberties as men. The average Bulgarian woman is well educated, married, has children and the strong support of her family. Subsequent communist and capitalist regimes ensured women's equality and freedom to work and earn their own livings. The "totalitarian heritage" with the image of "women work, as men do" and the following period of transition, characterised with increased competitiveness on the labour market, where women had to demonstrate fully their capabilities,

could have led to an absence of negative stereotypes towards professional skills of Bulgarian women.

After joining the EU, the status of women in Bulgaria continues to improve, as the country becomes more open, modern, industrialised and urban. Bulgarian women are gradually becoming successful in many fields, such as politics, science and business. They are increasingly eager to set up their own businesses, due to the given financial and social freedom.

Obviously, statistics are a good starting point, but it reveals just a fragment of the complex question about women in the managerial sphere, and only on the basis of this it is very difficult to answer the much debated question, whether men and women behave differently in leadership roles.

### **3. Purpose and objectives of the study**

Given the above gap in empirical literature regarding the leadership style of managers in transition countries, this study attempts to find out whether there are some significant differences between the leadership style of women and men working as managers in different sectors and companies in Bulgaria. The research expectations are that the obtained results will confirm the differences from the cited foreign studies especially that women are more transformational in their leadership style compared with men.

As such, the following questions will be addressed:

- What are the leadership-style profiles of practicing managers?
- How do women differ from men (gender differences)?

The accessible sample consisted of practicing managers (N = 120) and a 100% response rate has been achieved.

#### **3.1 Literature review**

The study of leadership has evolved from the identification of traits and characteristics in order to investigate the complex relationship between leaders and followers (Bass, 1990; Northouse, 2004). While there are different theories that can be used to identify and classify leadership styles (Northouse), the researchers have selected the transformational leadership paradigm to undergird this study. Transformational leadership was proposed by Burns (1978), and the model was further developed by Bass (1985) who identified transformational, transactional, and laissez-faire leadership styles.

A transformational leadership style is defined by a leader who is interested in helping to transform people from followers into leaders (van Linden & Fertman, 1998). Transformational leadership is a process, whereby leaders are able to transform their own goals into those of the organisation, for the good of the organisation and the members within that organisation. Transformational leaders are able to engender higher levels of motivation and commitment among followers by creating feelings of trust and loyalty by empowering, consulting and delegating.

The transformational leader is process-oriented and the focus is on being a leader (van Linden & Fertman, 1998). According to Northouse (2004), “transformational leadership is concerned with the performance of followers, and also with developing followers to their fullest potential” (p. 174). In contrast, a transactional leadership style is contingent on a transaction or exchange between leader and follower, which usually consists of a reward system. Transactional leaders value problem and solution identification, are product-oriented and focus on doing leadership tasks (van Linden & Fertman, 1998). A transactional leadership style promotes taking charge of many traditional leadership functions and making decisions in order to move the group forward, even if everyone has not been heard. Transactional leaders focus more on the outcomes than on the individual’s needs and personal development (van Linden & Fertman, 1998). Bass (1997) argued that transformational and transactional leadership styles complement each other, providing a synergistic relationship that adds to a leader’s effectiveness, which can also result in performance beyond expectations.

Avolio and Bass’s (2004) Full Range Leadership Model incorporates nine leadership factors, including five factors representing transformational leadership, three factors representing transactional leadership, and one factor representing laissez-faire leadership. In this model, transformational leadership is defined by five factors: idealised influence (attributed), idealised influence (behaviour), inspirational motivation, intellectual stimulation and individualised consideration. Idealised influence is a factor that draws followers to the leader during interactions. In this process, followers are positively influenced by a leader who has high standards of moral and ethical behaviour. Leaders that display idealised influence have a charisma about them and provide their followers with a sense of mission (Northouse, 2004). Idealised influence is both an impact and behaviour (Avolio & Bass, 2004), thus two leadership factors are necessary: idealised influence (attributed) and idealised influence (behaviour). Inspirational motivation is displayed by leaders who communicate effectively high expectations to followers and motivate them to commit to a shared vision of the organisation (Northouse, 2004). Intellectual stimulation is displayed by a transformational leader when he or

she supports followers in using their own creative and innovative problem-solving skills to deal with organisational issues. This type of leadership promotes followers to challenge their own beliefs and values as well as those of the leader.

Individualised consideration is represented by leaders who provide a supportive climate for their followers. Transformational leaders display individualised consideration when they act as coaches and mentors and encourage followers to reach their own goals and potential (Northouse, *ibid.*).

Contingent reward, management-by-exception (active) and management-by-exception (passive) are the three factors that comprise transactional leadership.

Contingent reward refers to the exchange that occurs between the leader and the follower, whereby the effort of the followers is rewarded by the leader. In this process, the leader receives agreement from the followers on the expected outcomes as well as the return for work completed (Northouse, 2004). Management-by-exception is displayed by a transactional leader in two forms: active or passive.

Corrective criticism, negative feedback and negative reinforcement are all characteristics of management-by-exception. In the management-by-exception (active) form, the leader closely monitors followers for mistakes and then takes action by correcting with negative feedback. Management-by-exception (passive) is demonstrated when the leader intervenes, when problems become serious and in case standards have not been met.

The ninth factor in Avolio and Bass's (2004) Full Range Leadership Model is laissez-faire leadership, which is characterised as a hands-off approach and there is little effort to help followers grow. This factor is demonstrated when a leader relinquishes responsibility, delays decisions and fails to follow up requests for assistance. The leader makes no attempt to help followers to grow personally (Northouse, 2004).

### 3.2 Methodology

Transformational leadership has been largely explored employing quantitative questionnaires, which serve to analyse and measure elements of transformational leadership. Bass and Avolio (1995) designed the Multifactor Leadership Questionnaire (MLQ), which is one of the most frequently used questionnaires.

The MLQ Short Form determines three leadership styles: *transformational*, *transactional*, and *laissez-faire* by assessing seven different behaviours, including four transformational (idealised influence, inspirational motiva-

tion, intellectual stimulation, and individualised consideration), two transactional (contingent reward and management by exception – MBE), and one non-transactional behaviour (laissez-faire) (See Illustration 1).

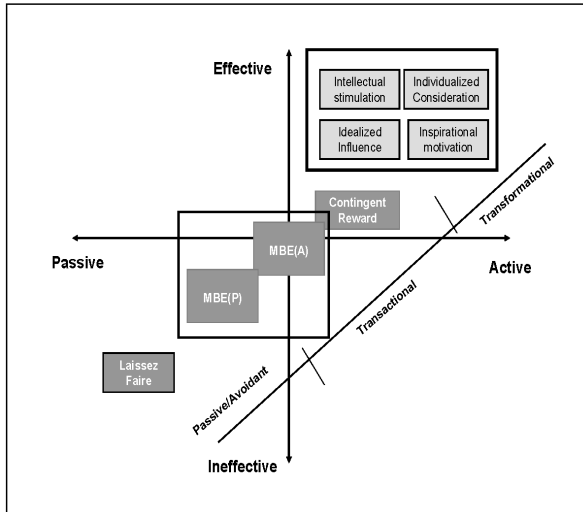


Illustration 1: Leadership styles based on MLQ

The MLQ is a reliable instrument and has estimates of internal consistency that range from .74 to .94 for the total items and for each of the factor scales (Avolio & Bass, 2004). Ratings of the respondents (by the respondents themselves) indicated how frequently a manager engaged in the behaviours that are prototypical of the four subscales of transformational leadership, the two subscales of transactional leadership, and the one laissez-faire scale (*Note. Scale: 0 = not at all, 1 = once in a while, 2 = sometimes, 3 = fairly often, 4 = frequently, if not always*).

### 3.3 Characteristics of the companies, participants and demographic profile

A stratified purposeful strategy was used to identify practitioners at different levels within the organisations representing different functional areas to provide a richer and broader understanding of the topic investigated. A total of 120 employees representing senior management level (12.5%), middle level (20.83%) managers, and supervisory level managers (66.67%) from various functional areas (such as human resources, finance, quality and

customer service, product development and design, process improvement, strategy, and manufacturing) have been chosen.

The study has been conducted in 24 private companies in Bulgaria – small (25%), medium (42%) and large companies (33%) located in Sofia. The companies have been chosen from different sectors, leading providers of insurance and bank products, building sector, water transport, consultancy, manufacture, telecommunications, TV, automobile sector, etc. The management of these companies was as follows: 58% typical Bulgarian management and 42% with a mixture of Bulgarian and foreign type of management.

All of the 120 managers, who were invited to participate, took part by completing a questionnaire survey adopted for the study. 66.7% of the participants were women (80) and 33.3% were men (40).

Their average age was thirty-five years. 51% of the participants had between 1–5 years of work experience for current employer, 36% had 6–10 years of work experience, 7% had 11–15 years, and 7% had between 16–20 years.

### **3.4 Findings and discussion**

This study concluded that the whole sample is more transformational in their preferred leadership style in contrast to transactional and laissez-faire styles. Specifically, this study found out that both female and male managers were engaging in transformational leadership behaviour fairly often, were sometimes engaging in transactional leadership behaviour, and were engaging in laissez-faire behaviour once in a while. While recognising that transformational and transactional leadership styles complement each other (Bass, 1997), research has shown that transformational leadership behaviour is correlated with preferred organisational outcomes such as employee and follower motivation, performance, and satisfaction; persuasive abilities; and the ability to adapt in changing times (Bass, 1998). As such, an implication of this study is that the transformational leadership style preferred by female and male managers might be advantageous when confronted with issues in the business environment.

At a more detailed level, we can look at fig.1 in order to see the tendency towards the most effective leadership profile.

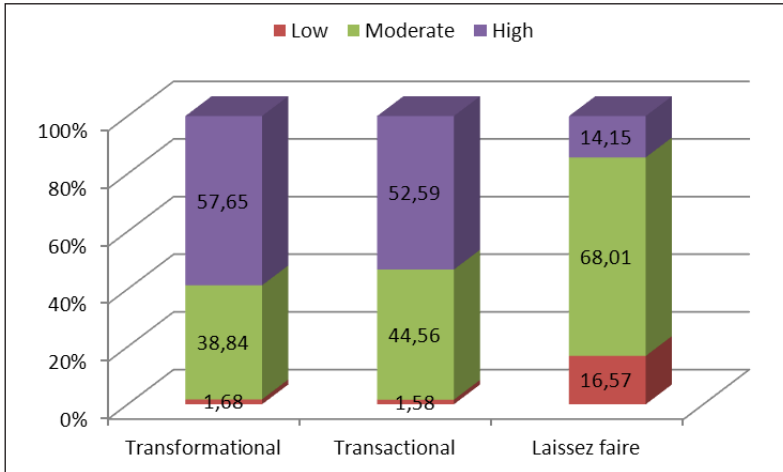


Figure 1: Leadership Style Scores – total

Transformational scores were very high for the pool of respondents: 57.65% had high scores and another 38.84% had moderate scores. Transactional behaviour was also high for the population, with 52.59% of respondents having high scores and another 44.56% having moderate scores. Laissez-faire style was moderately low amongst the population as 16.57% had low scores and 68.01% had moderate scores.

The second objective sought to determine, whether the preferred leadership style and leadership factors of managers differed on gender.

The data show strong leadership profile differences among female and male managers within the four behaviour categories constituting transformational leadership style. Figure 2 compares the percentages of respondents by gender receiving high scores for the behaviour and shows that women scored significantly<sup>1</sup> higher than men in two of the four areas (inspirational motivation and idealised influence) and lower than the men in the other two of the four areas (intellectual stimulation and individualised consideration).

1 ANOVA test: Female M=2.52, SD=0.80; Male M=2.12, SD=0.88, F=5.22, p<0.05



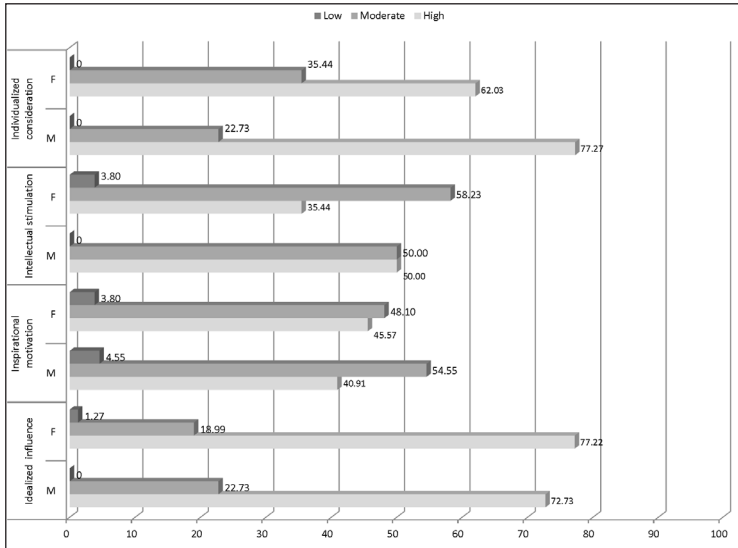


Figure 2: Comparing men and women on Transformational leadership style

These findings suggest that the female managers, more than the male managers, (1) manifested attributes that motivated their followers to feel respect and pride because of their association with them, (2) showed optimism and excitement about future goals.

The largest of these differences in the male direction was on the individualised consideration scale and the intellectual stimulation. Avolio and Bass (2004) describe this type of leader as being skilful at helping others to think about old problems in new ways; having the ability to conceptualise and articulate a group vision; and being likely to exhibit intellectual stimulation through critical thinking, questioning the status quo and in articulating a creative approach to accomplish the organisation’s mission.

Comparing men and women on transactional and laissez-faire style (fig. 3) it is obvious that men exceeded women on the transactional scales of management-by-exception (49.40% high scores – male managers, 31.80% – female managers) and contingent reward (77.27% high scores – male, 51.90% – female managers) and on laissez-faire leadership (18.18% high scores – male, 10.13% – female).

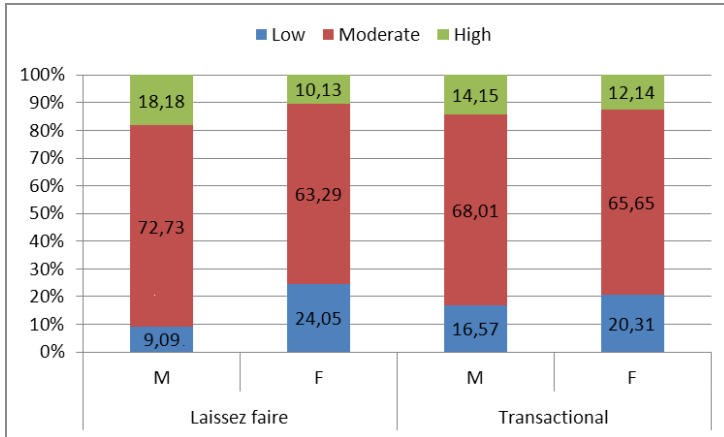


Figure 3: Comparing men and women on transactional and laissez-faire style

These findings suggest that male managers, more than female managers, (1) paid attention to their followers' problems and mistakes, (2) waited until problems became severe before attempting to solve them, and (3) were absent and uninvolved at critical times.

#### 4. Conclusions

The results have implications for the effectiveness of female and male leaders. Therefore, both women's higher scores on the transformational subscales and men's higher scores on management-by-exception and laissez-faire leadership suggest that the female managers in this sample could be more effective than male managers and could act as real inspirational leaders.

*Why?* This is due to the fact that transformational leadership is a process in which leaders are able to transform their own goals into those of the organisation for the good of the organisation and the members within that organisation. Transformational leaders are able to engender higher levels of motivation and commitment among followers by creating feelings of trust and loyalty by empowering, consulting and delegating. The leadership inspires followers with challenges and persuasion, providing both meaning and understanding. Finally, the leadership is individually considerate, providing the follower with support, mentoring, and coaching.

Because of the limitations of this investigation, there are still some key questions that remain unanswered. Furthermore, this research has also raised some interesting key questions:

- Does gender matter when it comes to leadership or are we interested in who the leaders are or what they bring to contribute to the role?
- Does it matter whether they are male or female or are we more interested in whether they are capable of performing the role well?
- What is meant by being an ‘effective leader?’ – Leaders’ – they are all so different, and it is just about showing that there are many different ways to be successful in companies.
- Due to the diversity of leaders: is it just about showing many different ways to be successful in companies?
- Why do psychologists take so little account of the managerial nature of work?

Interestingly, some of the answers could be given in the biographies of Bulgarian female leaders such as the story of Irina Tsvetkova “Focusing on professionalism rather than on gender”.<sup>2</sup>

*I would not divide people based on gender in a professional world – for me, there are people who are good professionals and should be given every opportunity to develop and grow within our firm. Sometimes women need a more flexible approach in relation to their responsibilities outside of work – family and children. But this can be managed in a proper way. This has been my approach in Bulgaria, and it has worked well.*

*I think women should pursue their career and develop their skills. They should remember that they are professionals and are valued for their contribution. They should be proud of their achievements and should not be afraid to impose their own management style, if they think it is appropriate ....*

*In my career, I have always tried to do things in a professional way and to provide the highest quality of work. I defended my own management approach and never tried to “be a man” – I did things in my own way, but always pursued the highest results. I always believed that I will be valued for my contribution and the results I achieve (PwC, 2011).*

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2 Irina Tsvetkova is the country senior partner of PwC in Bulgaria. With offices in two cities across the country (Sofia and Varna), the firm employs 186 people, sixty five percent of whom are female. At partner level, the percentage of women is very good: half of the firm’s partners are female, compared with 15 percent globally.

## 5. Summary

Ultimate Bulgarian women leaders are not afraid of recognising and dealing with the demands of conflicted and complex environments, they inspire others to do better and strive for excellence themselves. What they do need to do better, however, is to create a far better public understanding of what female leaders do, what could realistically be improved, and practical ways in which this might be achieved.

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## **Socio-cultural changes, values, and parental well-being – a comparison of Spanish and German mothers**

### **1. Parental well-being from a person-environment fit perspective**

Transition to motherhood challenges women and affects their well-being. New responsibilities are ascribed to them by culturally predominant role models or socio-political stipulations. However, depending on the cultural background and values personally preferred by an individual, this period of major adjustment processes may be experienced differently.

The concept of person-environment fit postulates two mechanisms that serve to explain differences in parental well-being. One mechanism emphasizes the complementary fit of a person's goals with the characteristics his or her environment provides, i.e. the compatibility of personal goals and opportunities for goal attainment offered by the environment. If goals remain unattained, a person's well-being will decline. The better a person's needs and goals are met, the higher his or her well-being will be. According to the other mechanism, well-being can be interpreted as a result of congruent personal and cultural *values*. This notion of supplementary fit holds that the better the match of the two value-systems, the higher the parental well-being (Bucher, 2003; Cable & Edwards, 2004; Myers & Diener, 1995; Sagiv, Roccas & Hazan, 2004). Both mechanisms are interrelated and have in common the notion that the better the fit, the higher the well-being.

In Western cultures appreciation of family and partnership is thought to oppose an equally strong individualistic inclination (Kagıtçıbaşı, 1996). In most countries, beliefs about gender-appropriate behaviour have undergone dramatic changes during the past 50 years, the only difference being timing and speed of the process (Kalmijn, 2003). Nevertheless, having children often still enforces a more traditional gender role behaviour on the parents (El-Giamal, 1999; Kluwer, 1998; Rost & Schneider, 1995; Skolnick & Skolnick, 1989). Hence, some conflicts (such as being rather individualistic, but having to adapt to parents' roles, like in the case of being a working mother) might become very prominent upon the birth of a child (e.g., Keizer, Dykstra & Poortman, 2010). Ascribing high value to family, children, and tradition is thought to be highly compatible to necessities of parenthood and

the associated cultural norms and values, while individualistic values are not. Since parental well-being is likely to be influenced by a person's own value system, thereby reflecting how well it fits with the environment, mothers favouring family and tradition should experience higher levels of well-being than those valuing individualistic attitudes.

It is important to understand the conditions for the emergence of well-being. Personal and cultural conditions are known to be relevant for reproductive behaviour (e.g. Kaufmann, 2005; Palomba, 1999). However, little cross-cultural research on the impact of personal and cultural values on parental well-being exists. The purpose of this study, therefore, was to contribute to research by comparing values, well-being, and their interrelation in two groups of mothers with different cultural backgrounds.

## **2. Values and well-being of German and Spanish mothers**

Spain and Germany are two European countries which have both been struggling with low fertility rates of about 1.4 for the past years (Instituto Nacional de Estadística, 2010; Statistisches Bundesamt Deutschland, 2011), a development that has frequently been linked to socio-cultural processes that also involve changes in the value systems. Compared to the situation in Germany, Spanish demographic development, individualization, secularization, and changes in gender as well as parental roles and related attitudes and behaviour began late. Since 1975, however, Spain has been undergoing very fast and profound socio-cultural changes (Delgado, Meil & Zamora López, 2008; Iglesias de Ussel, 1998; Kreis, 2004; Meil, 2006). Today, for instance, the use of day nurseries in Spain is quite common and widely accepted: According to the Spanish Ministry of Education, 43% of the 2-year-old children attended an "escuela infantil" in the years 2008/09, when 10 years before it had only been 15% (Ministerio de Educación, 2010). Percentage of use of day nurseries in Germany is and has been quite heterogeneous, due to its past with two different political systems. In 2008/09, 30% (West Germany) respectively 78% (East Germany) of the 2-year-old children were registered in day nurseries in Germany (Autorengruppe Bildungsberichterstattung, 2010).

Today, in spite of converging German and Spanish value systems, some differences in values related to children, individualism and traditionalism still persist. Similarities and differences of both value systems will be presented briefly.



## **2.1 Value of Children**

In Germany and Spain, family and children are still important, regardless of changes in the concept of family and the “Value of Children” (VOC; based on Hoffman & Hoffman, 1973), shifting from economic-utilitarian to psychological-emotional reasons for having children (Gloger-Tippelt, Gomille, & Grimmig, 1993; Mayer, Albert, Trommsdorff & Schwarz, 2005; Meil, 2006). However, when compared to Germans, Spanish people and culture are considered more child-friendly (UNICEF, 2007), and family life, children and partnership are more important (Henrich & Herschbach, 2000; Meil, 2006). Spain is still considered as an example of the family-focused culture of southern Europe (Díaz Martínez et al., 2004). Spanish mothers in our study thus should accord higher value to children and family than the German mothers.

## **2.2 Individualistic attitudes**

Individualistic attitudes are influenced by societal developments and their importance has constantly grown in both countries, resulting in high regard for independence, personal freedom, and personal achievement and interests. Personal autonomy and emotional independence are considered especially important, whereas dependency on others is rejected (Maier & Pekrun, 2003; Triandis, 1994). Despite the rapid changes within Spain, individualization has still not reached the same level as in Germany (Díaz Martínez et al., 2004; Meil, 2006). For instance, whereas about 75% of the German participants in the World Values Survey 1999-2000 considered “independence” to be an important value in child rearing, only 50% of the Spanish sample did so (cf. Meil, 2006). In studies on cultural value orientations, Germany is more closely located to the autonomy pole than Spain (e.g., Schwartz, 1999; Hofstede, 1980). Consequently, Spanish mothers in our study are expected to report less approval for individualistic attitudes than the German mothers.

## **2.3 Traditional attitudes**

Opinions about gender-role behaviour have become more egalitarian in Germany and Spain throughout the last decades. New concepts of fatherhood have developed and changed the concept of parenthood. Women have increasingly entered the labour market (Díaz Martínez et al., 2004; Iglesias de

Ussel, 1998; Kalmijn, 2003; Kreis, 2004; Meil, 2006; Peuckert, 2004). Attitudes towards gender roles are already more egalitarian in Spain than in West Germany. Opinions on working mothers or beliefs about who is responsible for earning the family's income, for instance, tend to be more liberal in Spain than in West Germany (Ashford & Timms, 1998; Kalmijn, 2003).

Although differences may exist in what are considered "typically male" or "typically female" activities (cf., Hofstede, 1980), Schwartz (1992) states that there are certain values like self-discipline, commitment, obedience, respect for and acceptance of traditions and religion that cross-culturally represent a traditional orientation. Spanish mothers would therefore be less likely to agree with traditional values than German mothers.

## **2.4 Parental well-being**

International studies on well-being conducted in both countries, Germany and Spain, repeatedly report higher levels of well-being for the Spanish (e.g. European Commission, 2002; Orizo, 1991; Meil, 2006). Parents from West Germany, for example, tend to experience high discrepancies between their ideal life and actual life as partners and family members. As a result, transition to parenthood is experienced as being more problematic by them than by parents from other western countries like the US or Austria (Quaiser-Pohl, 2001).

Hence, before testing our hypothesis on well-being depending on person-environment-fit, actual well-being in both samples was of interest. Afterwards, we tested for the correlations between the mothers' personal values and their well-being. According to the assumptions that a person's emphasis on family and tradition fits well and a preference for individualistic values fits poorly with the environment, substantial relationships between the values and components of well-being should emerge. Preference of family and tradition-related values should evoke well-being, resulting in positive correlations, whereas preference of individualistic values should diminish well-being, thus resulting in negative correlations. However, differences in how values may relate to well-being have been shown in cross-cultural research (e.g., Elliot, Chirkov, Kim & Sheldon, 2001) and, hence, correlations should be analysed within subsamples before drawing conclusions on correlations for the whole sample.

### 3. Method

#### 3.1 Participants

Spanish participants were 74 mothers of young children not older than 24 months. Many of the interviewed women were working mothers (80%), reflecting the high educational level of the sample (table 1). Spanish participants lived within the south or east of Spain, most of them in an urban area. Only 4.2% lived in the countryside, 27.8% in cities with no more than 10.000 inhabitants, and 68.1% in big cities.

The German sample consisted of 31 mothers of young children not older than 24 months. The level of education was as high as in the Spanish sample,  $\chi^2(2) = 2.23$ ,  $p > .05$  (table 1), and 53% of the women were working mothers. All 31 participants lived in the same West German region, most of them in a big city (32.3%) or city (45.2%), 22.6% lived in the countryside, indicating a less urbanized sample than the Spanish one,  $\chi^2(2) = 14.40$ ,  $p = .001$ .

Table 1: Educational level of sample according to International Standard Classification of Education (ISCED)

ISCED	German mothers <i>n</i> = 31	Spanish mothers <i>n</i> = 74
level 5	19 (61.3%)	55 (74.3%)
level 3 & 4	10 (32.3%)	14 (18.9%)
level 2	2 (6.5%)	5 (6.8%)

#### 3.2 Instruments

Several scales of the *Questionnaire for Parents* of the *International Survey on Personal and Social Identity in the Context of Globalization and National Differentiation* (Schmidt-Denter, Quaiser-Pohl, & Schöngen, 2002) were used. The questionnaire had been translated and back-translated from German to Spanish (available at [www.uni-koeln.de/phil-fak/psych/entwicklung/forschung/identitaet/index.html](http://www.uni-koeln.de/phil-fak/psych/entwicklung/forschung/identitaet/index.html)). All measures included in the study had been approved for their cross-cultural validity by comparing their reliability and their factorial structure using exploratory and confirmatory factor analyses (Grohmann, 2007; Schmidt-Denter & Schöngen, 2006).

### 3.2.1 Values

The psychological-emotional value parents attach to their children was assessed with the scale “Wert von Kindern” [Value of Children, VOC] by Nickel, Grant, and Vetter (1990) (e.g., one item read: “I imagine life without children must be boring.”). It was derived from a measure based on the “Value of Children” approach by Hoffman and Hoffman (1973). Response format was recoded to a 4-point scale, 1 meaning “I strongly disagree”, and 4 “I strongly agree”.

A shortened version of the “Freundschaften heterosexuelle – Ungebundenheitsbedürfnis”-scale [Heterosexual Friendships – Strive for Independence] by Fend and Prester (1986) was used to assess individualistic inclinations. For example, one item asked for the importance of not having any obligations within a partnership. Parents answered on a 5-point scale from 1 (not important) to 5 (very important), 3 already indicating slight approval for individualistic values.

Selected items were taken from the value list by Schwartz and Bilsky (1987; 1990) for assessing the parents’ traditional orientation, namely “social order”, “national security”, “respect for traditions”, and an additional new item labelled “Pflicht, Fleiß und Ordnung” [Responsibility, Effort, and Order]. Items had to be answered on a 6-point-scale, indicating the personal importance attributed to the value in question, 1 being “not important”, 5 “very important”, and including the option to check “0” if contrary to own values. Once again, 3 indicated slight approval, describing the respective value as “rather important”.

### 3.2.2 Well-being

In our research, several components of well-being were tested – one global, domain-unspecific aspect and two components strongly related to parenthood (satisfaction with partnership, feelings of competence as a parent). Domain-unspecific well-being was assessed using the subscale “Selbstzufriedenheit” [Satisfaction with Self] of the “Selbstintegrations”-measure [Integration of Self] by Satow (2000). Mothers had to express how strongly they agreed with statements like “I like myself the way I am.”. For satisfaction with partnership Hendrick’s (1988) “Partnerschaftszufriedenheits-Skala” [Satisfaction with Partnership] was used, asking, for instance: “In general, how satisfied are you with your partnership?”. Positive emotions associated with parenthood were assessed by the “Kompetenzen als Eltern” scale [Parental Competencies] by Schmidt-Denter, Quaiser-Pohl, and Schöngen (2002) (stating,

for instance, "I imagined being a mother to be easier."). All scales measuring well-being used a 5-point scale and were recoded so that 1 indicated the lowest, and 5 the highest level of well-being.

At the end of the questionnaire, mothers completed questions about their socio-demographic background.

### 3.3 Procedure

Participants were recruited through kindergartens, the baby ward of a hospital, and personal contact in urban areas in the south and east of Spain, and in urban areas in former West Germany. For each institution, contact to a person in charge was established. After receiving permission to distribute the questionnaires, paper-pencil versions and a written introduction were administered to mothers by the staff of kindergartens. In the hospital, questionnaires were directed as an interview. Answering the questionnaire was voluntary. Participation in a lottery of two children's T-shirts, with the logo of a German university, was optional. It took approximately one hour to complete the entire questionnaire.

## 4. Results

### 4.1 Values

Within the Spanish sample ( $M = 2.37$ ,  $N = 74$ ,  $SD = 0.67$ ) there was moderate agreement to the importance of psychological-emotional value of children as expressed in the VOC-scale. Approval was equally high within the German sample ( $M = 2.57$ ,  $N = 30$ ,  $SD = 0.52$ ), since mean differences were not significant  $F(1, 102) = 1.99$ ,  $p > .05$ ,  $\eta_p^2 = .02$ . Thus, results contradicted the expected superiority on this score for the Spanish sample.

Spanish mothers had quite heterogeneous opinions ( $SD = 1.07$ ,  $N = 74$ ) on the importance of independence, resulting in a mean of  $M = 2.67$ , whereas German mothers clearly rejected the notion of independence being important within a partnership ( $M = 1.76$ ,  $SD = 0.57$ ,  $N = 31$ ). Levene's test was significant  $F(1, 103) = 13.08$ ,  $p < .001$ , indicating that variances were not equal and results of this analysis were possibly too conservative. However, there was clear evidence that contrary to expectations, German mothers were less individualistic than Spanish mothers  $F(1, 103) = 20.02$ ,  $p < .001$ ,  $\eta_p^2 = .16$ .

When asked about traditional inclinations, the mean for Spanish mothers' answers ( $N = 74$ ) was  $M = 3.35$ , with a standard deviation of  $SD = 0.87$ . German mothers thought traditional orientation to be rather important as well ( $M = 3.03$ ,  $SD = 0.80$ ,  $N = 31$ ). However, results were contrary to expectations. There was a tendency for German mothers to accord less importance to traditional attitudes than Spanish mothers  $F(1, 103) = 3.11$ ,  $p = .08$ ,  $\eta_p^2 = .03$ .

In sum, contrary to expectation, Spanish mothers proved to be as family-focused, yet more individualistic and traditional than German mothers.

## 4.2 Well-being

Domain-unspecific well-being was quite high in both samples ( $M = 3.73$ ,  $SD = 0.67$ ,  $N = 74$  for Spanish mothers;  $M = 3.57$ ,  $SD = 0.81$ ,  $N = 31$  for German mothers) and, as predicted, means did not differ between countries  $F(1, 103) = 1.00$ ,  $p > .05$ . Also, Spanish ( $M = 4.10$ ,  $SD = 0.70$ ,  $N = 69$ ) and German mothers ( $M = 4.10$ ,  $SD = 0.58$ ,  $N = 31$ ) declared to be highly satisfied with their partnership and contrary to what was hypothesized, groups did not differ in this aspect  $F(1, 98) = 0.00$ ,  $p > .05$ . Both, Spanish ( $M = 3.69$ ,  $SD = 0.60$ ,  $N = 74$ ) and German participants ( $M = 3.80$ ,  $SD = 0.67$ ,  $N = 31$ ) expressed to feel rather confident as mothers. Contrary to expectation, however, Spanish mothers did not report higher levels of competence  $F(1, 103) = 0.65$ ,  $p > .05$ . So, once again unexpectedly, no difference was found between groups concerning domain-unspecific well-being. There were no group differences regarding satisfaction with partnership and mothers' feelings of competence either.

The fact that belonging to a specific culture did not explain any variance in well-being demonstrates that other factors have to be taken into account in explaining well-being, for instance the personal values, whose impact was investigated next.

## 4.3 Relationships between values and well-being

Correlations between values and well-being are summarized in table 2 for the German and Spanish sample. The postulated correlations between personal values and well-being were confirmed for the German sample, except for the variables "VOC" and "satisfaction with partnership" that did not correlate significantly. However, in sum, traditional German mothers and those,

who highly valued parenthood, reported higher levels of well-being than individualistic ones did.

In the Spanish sample only two variables, “individualistic attitude” and the overall well-being measured by “satisfaction with self”, were correlated significantly. Other pairs of variables either did not correlate or even showed a tendency to be correlated in the opposite way to what we had predicted. However, when testing for differences between correlations in the Spanish and German sample only half of them proved to be significantly different from each other (table 3). Nevertheless, in a joint analysis of both groups most of the correlational hypotheses were not confirmed either (table 3), indicating that correlations should be analysed for both samples separately.

Table 2: Correlations between values and well-being in German (above the diagonal) and Spanish sample (below the diagonal)

	1	2	3	4	5	6
1 VOC				.40*	.22	.63***
2 individualistic attitude				.36*	.33*	.37*
3 traditional attitude				-.44**	-.31*	-.34*
4 domain-unspecific well-being	-.14	-.08	.14			
5 satisfaction with partnership	-.08	-.18	.08			
6 feelings of competence	-.28**	-.02	-.03			

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; one-tailed.

Table 3: Correlations between values and well-being for whole sample (above the diagonal) and z-values for significance of differences between correlations (below the diagonal)

	1	2	3	4	5	6
1 VOC				.00	-.01	.27**
2 individualistic attitude				.07	-.05	.15
3 traditional attitude				-.23*	-.06	-.11
4 domain-unspecific well-being	2.47*	1.34	2.66**			
5 satisfaction with partnership	2.03*	2.31*	1.36			
6 feelings of competence	0.81	1.33	1.47			

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; one-tailed for correlations of values and well-being, two-tailed for z-values.

## 5. Discussion

In many regards our findings differed from previous expectations. First, we assumed that Spanish mothers accord higher value to children and family, are less individualistic, and tend to be more traditional than German mothers. However, Spanish mothers in this study accorded as much value to children as German mothers and more value to individualistic and simultaneously to traditional attitudes. This finding is not in line with other research on both countries (Ashford & Timms, 1998; Díaz Martínez et al., 2004; Henrich & Herschbach, 2000; Kalmijn, 2003; Schwartz, 1999), but might be explained by the widely described, fast changes Spain is undergoing (Iglesias de Ussel, 1998; Kreis, 2004; Meil, 2006). Estimation of family and children may have been declining in the value system of the Spanish and may have lost importance compared with individualistic attitudes, as reflected in the data structure of this study.

Second, with regard to parental well-being, no differences were found between Germany and Spain, though we had expected Spanish subjects to score higher on well-being.

And third, parental well-being was not influenced by the same aspects in these two countries. It is only for the German sample that values regarding children and traditionalism correlated positively and individualism correlated negatively with parental well-being. It may be assumed that German mothers struggle with an environment that on the one hand increasingly demands gender equality and individualization, but on the other hand idealizes parenthood and the concept of a “traditional family”. Mothers adopting those values will soon reach the limits of compatibility. Despite the increasing opportunities for individual decision-making, socio-political measures and infrastructural shortcomings still impede alternatives to the traditional type of family. German mothers possibly anticipate those difficulties and decide either to have no children at all or to become mothers (and get married and be a housewife for some time) depending on their most important values and aims, resulting in a polarization of women’s lifestyles (Kaufmann, 2005).

For the Spanish mothers in this investigation, results are less clear. However, the startling finding that values and well-being correlated in the predicted way within the German sample but not within the Spanish one may be explained by on-going socio-cultural changes as well. The values investigated in this study possibly just do not have any influence on *parental well-being*. The impact of meeting an aim or not depends on the personal value system. Thus, only personally important aims and values have an influence on personal well-being (Henrich & Herschbach, 2000). However, German and Spanish mothers in this study assigned different importance to the val-



ues investigated. Children were considered equally important by Spanish and German mothers, while individualism was valued more by the Spanish. This could be the reason for not finding sufficient proof of correlations with parental well-being in the Spanish sample. There could be a major influence on other areas of well-being instead, i.e. areas that more profoundly correspond with values that are nowadays important to the Spanish, such as individualism. Maybe an investigation on the relation of individualistic attitudes and *occupational well-being* or *leisure-time well-being* would yield interesting results. Both areas of life, occupation and leisure time, are supposedly more closely related to individualistic values than the “family” value. The correlation between individualism and global well-being in the Spanish sample is in line with this assumption.

Further support for explaining results by a fast changing society comes from careful examination of some of the items applied in the questionnaire. A quite general measure was used to collect data on traditional attitudes (e.g., agreement with “social order” or “national security” as being important guidelines for own life). The items under consideration do not measure attitudes towards parenting or gender role behaviour, but ask for aspects that in societies undergoing profound socio-cultural changes may reflect “societal harmony” rather than traditional attitudes (Schwartz, 1992). Since mothers from Spain still experience the long-term effects of the “Transición”, while at the same time fast socio-cultural changes are taking place, they may have shown a strong preference for those items, causing the unexpected results on this scale.

Thus far, interpreting the unexpected results as caused by socio-cultural changes in Germany and Spain – going in similar directions, but at different speeds – offers the most comprehensive explanation. In Spain, those changes seem to happen faster than in Germany (cf. Delgado et al., 2008; Iglesias de Ussel, 1998; Kreis, 2004; Meil, 2006).

Finally, some limitations of the study should be mentioned. Future research should include a measure for traditional values explicitly dealing with attitudes towards parenthood and partnership. Another constraint concerns the rather high socio-economic status (SES, assessed by educational level as a proxy) of both samples in this study. This might imply a limitation to the generalisability of the research, since several studies have linked higher SES to more individualistic parental attitudes, as reported by Phaet and Claeys (1993). Furthermore, future research should include mothers from other parts of both countries as well, bearing in mind that so far samples were only drawn from West Germany and predominantly urban areas in Spain.

In spite of the constraints mentioned, we believe that the surprising findings, contradicting former research on both countries, and probable further

socio-cultural changes – e.g., long-term effects following the implementation of socio-political measures in 2007 affecting parenthood in both countries (“Ley orgánica para la igualdad efectiva de mujeres y hombres“ in Spain and “Tagesbetreuungsgesetz” and “Bundeselterngeld- und Elternzeitgesetz” in Germany) – call for further research on how mothers’ well-being is affected by their personal values and cultural environments.

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## **Identity development after the birth of the first child – an empirical study of first-time mothers in the Republic of Ireland**

### **1. Introduction**

The interest in findings on psychological changes during the transition to parenthood has risen steadily in the past years. This is the case for parents-to-be and especially mothers-to-be as well as for professionals working in the field. Many mothers report not having been sufficiently prepared for the changes that go along with the transition to motherhood and they report experiencing a strong disparity between their anticipation of motherhood during pregnancy and the actual experiences they make when the child is born (Deave, Johnson & Ingram, 2008; McMahon, 1995). The underlying reasons for this are manifold and amongst others can be found in the historical transformation of the meaning of motherhood and the meaning of children. Ever since the 1960s a historically new freedom of choice regarding the decision for or against motherhood has developed as a result of new methods of conception control. This, combined with general transformations in society that had an impact on social structure, on individual life plans as well as on social values and norms, changed the meaning of children. Before this, external reasons like securing the provision for people's old age or assurance of economic prosperity often contributed significantly to the desire for having children. Nowadays, for many parents in western countries, reasons for the desire for having children have shifted to intrinsic reasons. Today, children are often seen as a symbol of love, a fulfilment of an intimate relationship, a source of emotional warmth and happiness, an extension of self-awareness or the accomplishment of the need to fully acquire the status of adulthood in society (Feeney, Hohans, Noller, & Alexander, 2001; Hoffmann & Hoffmann, 1973). For women in the western world, motherhood is not a natural destiny anymore (Gloger-Tippelt, 1988), but represents one lifestyle that can be actively chosen from a number of different lifestyles. In western societies today, where a lot of components that traditionally influenced identity have either been trivialised (e.g. social class) or destabilised (e.g. community membership), motherhood has a stronger impact on women's identity than ever, as it represents a differentiation from others as well as continuity over time – the two defining criteria of identity according to Baumeister (1986).

Motherhood in the Republic of Ireland has undergone a similar historical change. Fertility rates per woman have declined from almost 4 children born alive in the 1960s to the lowest rate of 1.84 in 1995 (Fahey, 2001) and have since stabilised at a rate of around 2.0 (Central Statistics Office, 2011). Female participation in labour force for women aged 25-54 years has steadily risen from 29 % in 1981 to 66 % in 2001 (OECD, 2011). Considerably later than in other western countries, the sale of contraceptives to the public without prescription was legalised in 1985 (IFPA, 2011), so that family planning and conception control in Ireland is now as prevalent as in other western countries.

Research on the transition to motherhood in the past 40 years has found out a number of well-replicated effects. A well-documented effect is that role allocation becomes more traditional (Leifer, 1980; Ruble, Fleming, Hackel & Stangor, 1988a; Rost & Schneider, 1995) and marital satisfaction often declines after the birth of the first child (Twenge, Campbell & Foster, 2003; Ruble et al., 1988a; Belsky, Lang & Rovine, 1985; Ruble, Brooks-Gunn, Fleming, Fitzmaurice, Stangor & Deutsch, 1990). Many mothers report feelings of social isolation after the birth of the infant (Nickel, Grant, & Vetter, 2001; Leifer, 1980; Ruble et al., 1990). During the time following the birth of the first child, the entire system of social relations is being restructured. The frequency and importance of external contacts declines and contacts to the family of origin gain in importance (Etrich & Etrich, 1995). In addition to these social changes many women experience a number of medical conditions (Sievers-Böckel, 2003), depressive moods and emotional instability (Leifer, 1980; Miller & Sollie, 1986).

Due to these various strains that are often associated with the transition to motherhood, it has been regarded as a *critical life event* for a long time (LeMasters, 1957; Dyer, 1963). In more recent works the emphasis has shifted onto the developmentally stimulating aspects of this role transition (Schneewind, 1983). According to this view Nickel and Quaiser-Pohl (2001) understand the transition to motherhood as a normative, socially expected, predictable and culturally important turning point and a role transition that serves as a developmental stimulus. Social transitions are also predestined to act as a stimulus for identity development (Haußer, 1995; Schmidt-Denter, 1988).

The transformations and developments that go along with the transition to parenthood have been described in a number of models (Mercer, 1995; Ruble, 1994; Smith, 1999; Gloger-Tippelt, 1988) of which Gloger-Tippelt's model of the transition to motherhood is the most prevalent in the German-speaking countries (Wicki, 1997; Nickel & Quaiser-Pohl, 2001; Schmidt-Denter, 1988; Wiegand, 1998).



## 2. Theoretical background

### 2.1 Gloger-Tippelt's Phase Model of the Transition to Parenthood

Gloger-Tippelt (1988) postulates eight phases of the cognitive-emotional processing of the transition to parenthood. These phases are embedded in a prenatal and a postnatal cycle of processing that show a similar pattern of development (Fig. 1). The model was developed on the basis of an analysis of qualitative interview data.

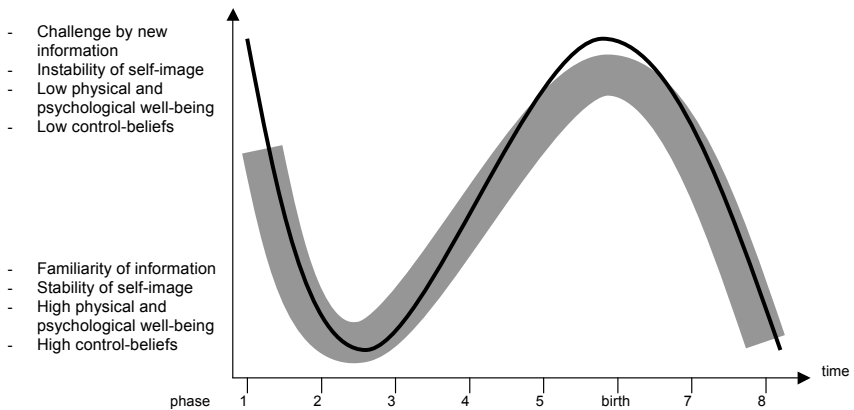


Figure 1: Phases of the transition to motherhood according to Gloger-Tippelt (1988)

Each phase is characterised by certain manifestations of variables in four domains of psychological characteristics. These domains of characteristics are *Challenges through New Information*, *Stability of Self-image*, *Psychological and Physical Well-being* as well as *Control-beliefs and Beliefs in Parental Competence*. The notice of pregnancy and the early pregnancy are accompanied by a great number of new information which are often associated with feelings of insecurity, loss of control and impairment of physical and psychological well-being. The four domains of characteristics stabilise in the course of this first cycle. With the birth of the infant and accordingly with the beginning of the second cycle, a similar pattern can be observed. The cycle starts with the processing of new information which is accompanied by instabilities in the self-image, insecurities regarding the competence as a parent and a decline in psychological and physical well-being as well as an increase in feelings of anxiety. The cycle ends with the stabilisation of these components. As the present study focuses on phases seven and eight, these phases will be described in detail.

*The phase of Challenge and Readjustment (phase 7):* Gloger-Tippelt deCscribes the phase of challenge and readjustment as lasting from around the second to the sixth month after the birth of the new infant. In this period the new parents have to integrate new information mainly from two sources. On the one hand the child starts to be socially more active and responsive and develops a specific bond with its caregivers. On the other hand many couples realise that they can spend less intimate time with each other and a new role allocation and distribution of tasks evolves. The self-image as mother or father is instable in this phase. Beliefs in parental competence start to develop.

*The Phase of Adjustment (phase 8):* According to Gloger-Tippelt the phase of adjustment starts around the sixth month postpartum and ends around the completion of the infant's first year. In this phase existing information on motherhood and parenting needs to be elaborated and evaluated and an adjustment to the new role allocation and distribution of tasks is taking place. Emotional instability and stress decline and physical and psychological well-being increase. Beliefs in parental competence are stabilising and the new activities as mother or father are experienced as belonging to the new self-image. With the internalisation of the new parental role the transition to parenthood is regarded as accomplished.

## **2.2 The Structural Model of Personal and Social Identity by Schmidt-Denter et al.**

In order to further investigate the identity development after the birth of the first child, the *Structural Model of Personal and Social Identity* by Schmidt-Denter et al. (2002) was applied. This model is a multidimensional and hierarchical model of identity and differentiates on the highest level between personal and social identity (Fig. 2). Based on the *Model of Development of Self* by Fend (1994) it divides personal identity into *Reflecting Self*, *Real Self*, *Acting Self* and *Ideal Self*. The *Real Self* is according to the *Three-Component Approach to Identity* by Haußer (1995) subdivided into the components *Self-Evaluation*, *Self-Concept* and *Control-Beliefs*. Following Tajfel (1982) the *Social Identity* is subdivided into *Perceived Affiliation to Groups* and *Attitude towards Out-groups*.

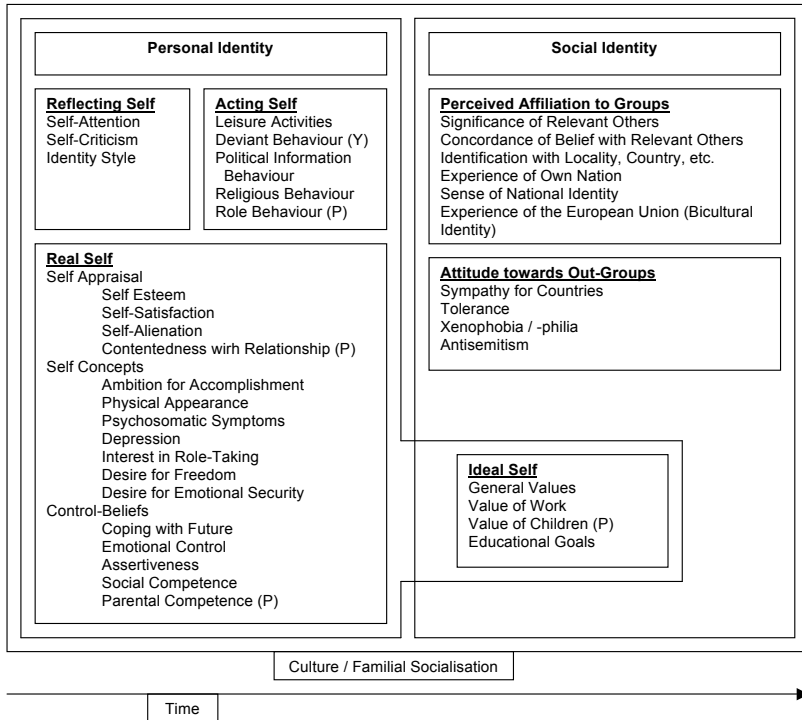


Figure 2: The Structural Model of Personal and Social Identity by Schmidt-Denter et al. (2002)

Due to the absence of a quantitative evaluation of Gloger-Tippelt’s model, the present study tested whether the postnatal phases seven and eight with their different manifestations of characteristics can be empirically supported. Additionally, the phases seven and eight were analysed with regard to differences in variables of identity that had not been included in the model yet. Due to the many social implications of the transition to motherhood that have been observed in a number of studies (Nickel et al., 2001; Leifer, 1980; Ruble et al., 1990; Ettrich & Ettrich, 1995), aspects of social identity have been analysed in connection with Gloger-Tippelt’s phase model for the first time.

### 3. The empirical study

#### 3.1 Empirical support of the characteristics of the phases

Gloger-Tippelt does not differentiate the postnatal phases of the transition to parenthood by means of the age of the newborn child, but distinguishes the phases by means of different manifestations in the four domains of characteristics that represent the characteristic cognitive-emotional state of each phase. In order to test whether the presumed manifestations of variables in the four domains of characteristics can be supported empirically for the phase of challenge and readjustment and the phase of adjustment, it was hypothesised that the study sample could be divided into two groups that reflect the manifestations of characteristics presumed by Gloger-Tippelt.

Three of the four domains of characteristics in Gloger-Tippelt's (1988) phase model can be depicted by variables of the *Structural Model of Personal and Social Identity* by Schmidt-Denter et al. (2002) as shown in table 1.

Table 1: Domains of characteristics in the Phase Model of the Transition to Parenthood by Gloger-Tippelt (1988) and representing variables in the Structural Model of Personal and Social Identity by Schmidt-Denter et al. (2002)

Domain of characteristics in the Phase Model of the Transition to Parenthood by Gloger-Tippelt (1988)	Representing variables in the Structural Model of Personal and Social Identity by Schmidt-Denter et al. (2002)
control-beliefs and beliefs in parental competence	➔ parental competence coping with future
stability of self-image	➔ satisfaction with self self-alienation
psychological and physical well-being	➔ psychosomatic symptoms depression
challenges through new information	➔ -

The resulting cluster solution could only be seen as a confirmation of the assumptions of Gloger-Tippelt's phase model, if the mean scores of the grouping variables in both clusters showed a specific pattern that could be predicted from the model's assumptions. Thus *Parental Competence* and *Coping with Future* should be lower for women in the phase *Challenge and Readjustment*. *Satisfaction with Self* is expected to be lower and *Self-Alienation* is expected to be higher in the phase *Challenge and Readjustment*. *Psychosomatic Symptoms* and *Depression* are presumed to be higher in the phase *Challenge and Readjustment*. Those mothers who were grouped in the

phase *Challenge and Readjustment* were expected to have relatively younger children. This observation would support the presumed chronological sequence of the phases.

### 3.2 Changes in Social Identity

In numerous studies it was observed that the transition to parenthood goes along with significant changes in social networks, especially for mothers. Schmidt-Denter (2005) speaks of a reorganisation of the entire inner- and outer-familial network of relations. In his theory of social identity Tajfel (1982) points out that the significance of group-memberships can vary as a result of social situations. Other authors also assume that different aspects of identity can have varying impacts in different social situations (Mummendey & Simon, 1997; Markus & Wurf, 1987). This assumption was empirically supported for different saliences of the identity as a mother by Cowan et al. (1978) and Delmore-Ko (2000). In the present study it was therefore assumed that perceived group affiliation and attitudes towards out-groups – i.e. relevant aspects of social identity – would change in the course of the postnatal phases of the transition to parenthood.

*Perceived Group Affiliation.* Assumptions on direction and nature of this transformation can be derived from the *Model of Identity Transformation During the Transition to Motherhood* by Smith (1999). According to Smith the transition to motherhood goes along with an increase in importance of the nuclear family and a decrease in importance of public life, e.g. work. A similar pattern of transformation was assumed by other authors (Hoffman & Manis, 1978). Hence perceived affiliation to psychologically closer groups, e.g. family and friends, is expected to be more distinct in the phase of challenge and readjustment than in the phase of adjustment.

Smith (1999) assumes in his model that according to Mead's (1980) symbolic interactionism the increase of significance of relevant others after the birth of the first child facilitates the role-taking for the new mother. Mercer (1995) also presumes in her *Stage-Model of the Adaptation of the Identity as Mother* that new mothers tend to orientate their behaviour on relevant others in this phase. Smith (1999) assumes that the new mother's emotional bond to her family of origin gains in significance after the birth of the first child. On this theoretical basis it was hypothesised that the concordance of beliefs with the own parents is higher during the phase of challenge and readjustment than in the phase of adjustment. The increased identification with psychologically closer groups after the birth of the child goes along with a reduced interest in and a reduced significance of psychologically more distant

groups (Smith, 1999; Hoffmann & Manis, 1978). In the present study it is therefore assumed that in the phase of challenge and readjustment the perceived affiliation to the group of the own nation is decreased. Additionally, it was tested whether mothers differed in the overall perceived affiliation to groups in the two investigated phases of the transition to motherhood.

*Attitudes towards Out-Groups.* Derived from the theoretically assumed decreased interest in psychologically more distant groups it was expected that the scores on the variable *Tolerance* would be lower in value in the phase of challenge and readjustment than in the phase of adjustment. The assumption of the increased significance of psychologically closer groups according to Smith (1999), going along with an increased general anxiety in the first months after the birth (Feeney et al., 2001; Ruble, 1990; Sievers-Böckel, 2003) lead to the hypothesis that mothers in the phase of challenge and readjustment show an increase in *Xenophobia*, i.e. an unreasoned fear of foreigners or of that which is foreign, compared to mothers in the phase of adjustment. It was also assumed that the two groups would differ with regards to the overall attitude towards out-groups.

### 3.3 Data collection

Data collection was realised in the context of the Europe-wide research project *Personal and Social Identity in the Context of Globalisation and National Demarcation* (Schmidt-Denter et al., 2002) in the Republic of Ireland. The study sample consisted of first-time mothers living in the Republic of Ireland. Data were collected with the *Questionnaire for Assessing Personal and Social Identity* (Schmidt-Denter et al., 2002). The questionnaire collects data representing all variables of the Structural Model of Personal and Social Identity by Schmidt-Denter et al. (2002). Response options were mainly on 5-point rating scales. Sociodemographic variables were also collected. Study participants were recruited through kindergartens in the metropolitan area of Dublin and online via websites and bulletin boards for pregnant women and parents. Participation in the study was voluntary and was not compensated.

### 3.4 Data analysis

Testing of the hypotheses was conducted in two steps. First, the sample was divided into two groups by means of a cluster analysis. Secondly, the resulting two clusters were analysed regarding the manifestations of the

grouping variables derived from Gloger-Tippelt's model and regarding the assumed chronological sequence of the two investigated phases. Three of the four domains of characteristics by Gloger-Tippelt (1988) are represented by two variables each of the *Structural Model of Personal and Social Identity* (Schmidt-Denter et al., 2002) (see tab. 1). These six variables constituted the grouping variables in the cluster analysis. With regard to the chronological sequence of the two investigated phases it was tested whether for women in the cluster *Challenge and Readjustment* less time had elapsed since the birth of the child than for women in the phase *Adjustment*. This was tested through the variable *Age of Child*. In this and the following analysis the clusters functioned as grouping variables and therefore as independent variables.

#### 4. Results

In a cross-sectional design the data of  $N = 62$  women were analysed, who had a child between the age of 1–48 ( $M = 14.8$ ,  $SD = 10.1$ ) months at the time of interrogation. All study participants were first-time mothers living in the Republic of Ireland. 56.5% of the participants were recruited through kindergartens in the metropolitan area of Dublin and 43.5% of the sample were recruited online via websites and bulletin boards for pregnant women and parents. The response rate for the questionnaires that were distributed via kindergartens was comparably low (19.2%). The online distribution revealed a response rate of 53.6%. The mean age of the participants was  $M = 32.7$  years ( $SD = 3.97$ ,  $n = 61$ ). The majority of women stated to be married (94.7%,  $n = 59$ ) and to be in employment (93.5%,  $n = 58$ ). A university degree was obtained by 46.8% ( $n = 29$ ) of the sample, another diploma by 29% ( $n = 18$ ), a leaving certificate by 19.4% ( $n = 14$ ) and 4.8% ( $n = 3$ ) reported not having completed secondary school. Half of the sample (50%,  $n = 31$ ) was of Roman-Catholic religion and 85.5% ( $n = 53$ ) were of Irish nationality.

#### 4.1 Empirical support of the characteristics of the phases

The scales *Psychosomatic Symptoms* and *Depression* in the *Questionnaire for the Assessment of the Personal and Social Identity* (Schmidt-Denter et al., 2002) that represent the group of characteristics *Psychological and Physical Well-Being* in Gloger-Tippelt's phase model showed a positive intercorrelation ( $r = 0.41$ ,  $p < 0.001$ ) and were thus combined to one scale. The scales *Satisfaction with Self* and *Self-Alienation* that represented the group of characteristics *Stability of Self-Image* were negatively correlated ( $r = -0.57$ ,  $p < 0.000$ ) and were thus kept as separate scales when computing the groups. Due to its low reliability of  $\alpha = .3189$  the scale *Parental Competence* was not included as a grouping variable in the cluster analysis. For the group of characteristics *Control-Beliefs and Parental Competence* the scale *Coping with Future* was therefore used as the single grouping variable. On the basis of these four variables the sample was clustered into two groups using the k-means method. The testing of the preconditions for variance-analytical tests revealed no limitations.

$N = 22$  mothers were included in cluster A. These mothers reported lower *Satisfaction with Self* ( $F(1, 60) = 38.26$ ,  $p < 0.001$ ,  $\eta^2 = 0.39$ ) and higher *Self-Alienation* ( $F(1, 59) = 53.13$ ,  $p < 0.001$ ,  $\eta^2 = 0.47$ ) than women in cluster B. According to expectations the women in cluster A reported more psychosomatic symptoms and experienced depressive symptoms more often ( $F(1, 60) = 33.55$ ,  $p < 0.001$ ,  $\eta^2 = 0.36$ ). They also reported lower beliefs in their competence to cope with future problems ( $F(1, 60) = 34.25$ ,  $p < 0.001$ ,  $\eta^2 = 0.36$ ). The observed pattern of variable values was in accordance with the hypotheses derived from Gloger-Tippelt's model. Women in cluster B ( $n = 40$ ) reported higher *Satisfaction with Self* and lower *Self-Alienation*. They less frequently experienced depressive and psychosomatic symptoms and reported stronger beliefs in own strategies for coping with future problems (Fig. 3).

*Testing of the chronological sequence of the transitional phases.* The babies of the mothers in cluster A were on average  $M = 11.7$  months old ( $SD = 6.8$ ) and thus significantly younger than the babies in cluster B ( $t = -1.87$ ,  $df = 60$ ,  $p < 0.05$ ). The children in cluster B had a minimum age of 6 months and a maximum age of 48 months ( $M = 16.6$ ,  $SD = 11.2$ ), whereas in cluster A the minimum age was 1 month and the maximum was 24 months. The two clusters did not differ significantly in any of the sociodemographic variables that were analysed as control variables.



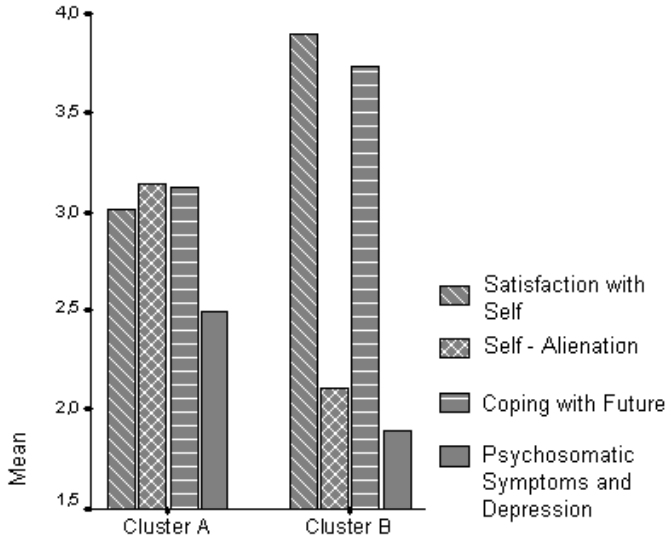


Figure 3: Mean scores of Satisfaction with Self, Self-Alienation, Coping with Future and Psychosomatic Symptoms and Depression in the cluster solution.

## 4.2 Differences in variables of the Social Identity

According to expectations cluster A and B differed significantly in the reported *Perceived Affiliation to Groups* ( $F(5, 56) = 3.75, p = 0.01, \eta^2 = 0.25$ ). One-way analyses of variance revealed the following results for the single hypotheses. The importance of the own family ( $F(1, 60) = 2.53, p = 0.06, \eta^2 = 0.04$ ) and the importance of work colleagues ( $F(1, 60) = 2.07, p = 0.08, \eta^2 = 0.03$ ) did not differ significantly between the clusters. In contrast to the postulated hypothesis the importance of friends was detected to be lower in cluster A than in cluster B ( $F(1, 60) = 16.44, p < 0.001, \eta^2 = 0.22$ ). The clusters did not differ with regard to the *Concordance of Beliefs with Relevant Others* ( $F(1, 60) = 1.99, p = 0.08, \eta^2 = 0.03$ ). The hypothesis concerning *Sense of Nationality* was supported by the present findings. Mothers in cluster A reported lower *Sense of Nationality* than mothers in cluster B ( $F(1, 60) = 3.32, p < 0.05, \eta^2 = 0.05$ ). With regard to the *Attitudes towards Out-Groups* no significant differences were found out ( $F(2, 59) = 2.35, p = 0.10, \eta^2 = 0.07$ ) whereas the two groups differed in *Tolerance* according to the hypotheses ( $F(1, 60) = 4.76, p < 0.05, \eta^2 = 0.07$ ). Mothers in cluster A reported lower tolerance. The hypothesis regarding *Xenophobia* was not supported by the present data ( $F(1, 60) = 0.41, p = 0.26, \eta^2 = 0.007$ ).

## 5. Conclusion

The present study investigated identity development of first-time mothers after the birth of their first child. For the conceptualisation of different postnatal phases Gloger-Tippelt's (1988) *Phase Model of the Transition to Parenthood* was used. The phases 7 *Challenge and Readjustment* and 8 *Adjustment* were empirically tested with quantitative measures and were investigated with regard to transformations of the social identity.

The assumptions of Gloger-Tippelt's phase model for the phases 7 and 8 were supported by the present data. Mothers that were assigned to phase 7 *Challenge and Readjustment* reported lower *Stability of Self-Image*, lower *Physical and Emotional Well-Being* and lower *Control Beliefs*. Mothers that were assigned to phase 8 *Adjustment* were characterised by a more stable self-image, higher physical and emotional well-being and stronger control beliefs.

The chronological sequence of the phases was also supported by the data. But the results of the study suggest a modification of the time specifications of the phases. According to Gloger-Tippelt the transition from phase 7 to phase 8 occurs around the sixth month after the birth of the infant. In the reviewed sample the transition from the phase *Challenge and Readjustment* to the phase *Adjustment* was observed between the 12<sup>th</sup> and 16<sup>th</sup> month postpartum.

The findings also support the assumption that social identity is transformed during the postnatal phases of the transition to motherhood. The data show that perceived group affiliation and their appraisal transform in the phases 7 and 8. The interest in out-groups and the importance of friends are lower in the phase *Challenge and Readjustment*. This can be interpreted in the sense that public life and psychologically more distant groups receive less attention in this phase of the transition to motherhood. It is assumed that a shift of focus onto the nuclear family, the own person, the new baby and the partner takes place in this phase.

The findings of this study provide useful information for preventive measures for supporting couples and especially women in the transition to parenthood. For such measures it is vital to provide parents-to-be with an idea of parenthood that is as realistic as possible, because it was found out in a number of studies that disappointing expectations regarding the time after the birth of the child are among the strongest indicators for difficulties in the adjustment to the new situation (Wicki, Messerli & Zehnder, 1995; El-Giamal, 1997; Reichle & Montada, 1999; Ruble et al., 1988a). In this context Gloger-Tippelt's *Phase Model of the Transition to Parenthood* (1988) can provide a framework for illustrating the expected transformations

that go along with the transition to parenthood. The findings of this empirical study suggest that parents-to-be should also be prepared for the phase of *Challenge and Readjustment* to last until the completion of the baby's first year and thus expectations, that the adjustment to the new situation with the baby could successfully be accomplished within a few weeks, can lead to disappointment and frustration.

The findings regarding the transformation of the social identity can also provide useful additional information for prevention programmes in this area. The knowledge about the possibility that the new mother's focus of attention may shift to her nuclear family during the phase of *Challenge and Readjustment*, that she might show less interest in public life and that, according to the findings in this study, the importance of friends might decline in this phase, could help preventing misunderstandings and generating more support from the social network.

Future research should test Gloger-Tippelt's phase model empirically on the background of Schmidt-Denter's *Structural Model of Personal and Social Identity* within a longitudinal design, and if possible, include all eight phases of the transition to parenthood. It would also be interesting to investigate whether the assumed characteristic cognitive-emotional states of the phases also apply to the transition to fatherhood. Furthermore, it is of great interest to further investigate the changes in social identity that go along with the transition to parenthood and replicate the current findings under differing contextual circumstances.

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## **Gender relations in family – equal parenting**

### **1. Introduction**

This article deals with the relations in families between women and men according to their parental roles. As we live in an era of transition regarding the definitions of femininity and masculinity and traditional social roles of mother and father, the relative balance of fathers' and mothers' participation in child care is a subject of negotiation among contemporary couples. However, the problem of gender relations in the family should be analyzed also in macro structural context. Opportunities and difficulties in creating equal parenting depend on cultural factors – conceptualization of women's and men's roles in society as well as institutional factors – family policy. The first part of the article presents macro-level factors in terms of parenting patterns in Polish society. The second part focuses on a micro level – gender relations negotiated and practiced in selected families, individual conceptions of motherhood and parenthood of young, well-educated, working parents and big city inhabitants who participated in a qualitative research.

### **2. Macro structural context**

#### **2.1 Cultural context – gender stereotypes and stereotypes of parental roles**

Research results reveal that still a significant part of Polish society presents a traditional understanding of gender roles (Dzwonkowska, 2007). In a poll conducted by Public Opinion Research Center (CBOS) in 2006 almost one third of Poles (32%) – 37% of men and 28% of women – declared that the best situation for a family is when only the husband works (assuming that he earns enough money to support the next of kin) and the wife takes care of the household and the children (traditional model of the family) (CBOS, 2006). The family partnership model, where both husband and wife work and share the responsibilities connected with child rearing, was preferred by 41% of Polish society – 35% of men and 47% of women. Almost one-fourth of the respondents (24%) believed that the most convenient type is a kind of a mixed model of family, in which both spouses work, but the hus-

band spends more time on occupational work, and the wife, apart from her professional duties, takes care of the home and the children. The analysis of results of polls conducted between 1997–2006 shows that the number of Poles opting for partnership in the family has increased. Most egalitarian are young and well-educated inhabitants of big cities, especially women (CBOS, 2000; CBOS, 2006). “Gender, age and education are factors that strongly affect which family models people find acceptable” (Siemieńska, 2005, p. 14).

Findings of public-opinion surveys conducted in last decade among Poles show changes in the conceptualization of women’s and men’s roles in society. Nevertheless, a stereotypical way of thinking about women and men is still very strong in Poland. Despite clear social expectations and declarations by many Poles that both parents should be equally responsible for children’s upbringing and education (95% of Poles) the main burden of parenting, especially at the infant’s age, is borne by women. Fathers become more involved when children get older. According to the results of the research presented in the book “Women’s Gratuitous Work” mothers are responsible for physical caregiving (feeding, diapering, dressing, bathing), child-minding, medical prevention and healthcare (doctor visits), reading aloud to a child, playing, contact with kindergarten staff and school teachers (Titkow, Duch-Krzystoszek, Budrowska, 2004, p. 214). Fathers are generally active (always less active than mothers) but usually in the most pleasant fields of activity such as organization of entertainment – going to cinema or a fair. They often also escort children to and from kindergarten or school, arrange their free time, take them for a walk (Titkow et al., 2004, p. 214). “Duties belong to mum, pleasures – to dad” as affirmed the son of one of respondents (Titkow et al., 2004, p. 217). As Bird noticed, such a division that “fathers do what they like with children, while mothers do what has to be done with them” is observed also in other societies (as cited in Jump & Haas, 1987, p. 99). Fatherhood in comparison with motherhood seems to be easier and more pleasant a task and it does not absorb men to such an extent as maternity absorbs women.

## **2.2 Institutional context – family policy**

According to M. Kimmel increasing men’s participation in housework and child care and developing an idea of equal parenting requires a combination of micro-level and macro-level supports – “Individually, men have to *want* to do more, and they will also need support from their wives and from their male friends, coworkers and colleagues. (...) Working couples will also need to have structural, macro-level supports, such as family-friendly work-



place policies, paid parental leave and adequate health care” (2004, p. 139). Most important for the idea of equal parenting is a family policy supporting the reconciliation of professional and family duties in dual-earner model of family. Polish family policy guarantees the protection of maternity ensuring employment security as well as occupational health and safety for working pregnant women and mothers with small children (Balcerzak-Paradowska, 2004, p. 29). Currently, women are entitled to a primary (mandatory) 20-week maternity leave and an additional (optional) 2 week period which will be gradually extended (in 2012 and 2013 additional maternity leave will last 4 weeks and in 2014 – 6 weeks) (Labour Code, Art. 180). Having used at least 14 weeks of maternity leave, a female employee may give up the remaining part for the benefit of the father who is also entitled to a weekly leave at any time during one year from the childbirth (from 2012 onwards paternity leave will reach its duration of 2 weeks). At the time of maternity and paternity leave the benefit paid should correspond to the parent-employee’s salary.

Upbringing leave is addressed to both parents (it can be defined as “parental leave”). It lasts up to 36 months, yet only until the day when the child is 4 years of age (Balcerzak-Paradowska, 2004, p. 30). The upbringing leave can be used by one parent (and is used usually by mothers) or can be divided between the two parents who may stay on their leave together for a period of 3 months. The right to childcare allowance during parental leave is only given those people who are below a certain level of income per capita in the family (Balcerzak-Paradowska, 2004, p. 31).

As B. Balcerzak-Paradowska states, it seems that although family policy is based on the idea of gender equality and takes into consideration the dual-earner model of family, it fails in terms of implementation and promotion of the idea of equal parenting (2004, p. 225). The majority of people in Poland (women and men) take it for granted that parental leave is for mothers. Although most regulations of Polish family policy are addressed to both parents, in fact it is the women who usually benefit from them. In Poland, like in France, “the encouragement of fathering is not really on the policy agenda” (Almqvist, 2008, p. 198). The reasons for such a low interest among men in the enjoyment of employee rights for working parents are the domination of traditional perceptions of the division of labour regarding housework and child-minding, and also economic factors – men earn more money than women, so it is simply more advantageous when the mother stays at home (during maternity leave, upbringing leave etc.) and the father works (Balcerzak-Paradowska, 2004, pp. 250–251).

### **3. Micro structural context – the idea of equal parenting in the process of negotiation and implementation in the family among young, well-educated, working, big city inhabitants in Poland**

The above-mentioned results of social research show that more and more people in Poland – mainly young, well-educated and living in big cities – reject gender stereotypes. This group prefers a family partnership model, where both husband and wife work and share the responsibilities connected with bringing up children. The question is, whether they realize this model in their own families. The paper presents results of a qualitative research study conducted in 2007 in a group of young, well-educated and working parents. Its aim was to explore their experiences in realization of equal parenting, difficulties they had to overcome and ways of negotiation of parental roles when both spouses were employed. The study was based on a sample of in-depth interviews with 20 couples (mothers and fathers were interviewed together). Additionally, 4 focus group interviews were carried out (1 – with 8 mothers, 1 – with 8 fathers, 2 were mixed including 4 mothers and 4 fathers). All participants in both types of research were 5-35 years old and well-educated, had children under 3 years of age (mostly one child), worked professionally (they could at the moment use maternal or parental leave) and their spouses were also employed (or staying on a maternal or parental leave). Finally, all of the respondents were city dwellers and lived in Lodz (big city in central Poland).

#### **3.1 A concept of equal parenthood**

For most of interviewed couples partnership between parents in the family was obvious and natural. They understood it as an equal or comparable involvement of mother and father in childcare and upbringing. They also defined their share of parental duties as “common child care”, “teamwork”, “replaceability”, and “equality”.

“Both of us were engaged practically to the same extent. Well, it changed a little bit when my husband went to work (after he used his holiday), but he was still engaged after he came back home” (F17).

“From the beginning we have decided that our relationship is based on partnership and there is no such division of duties <you do this, this and that and I do this and that>. When I’m at home I prepare

dinner, when my husband is at home, he cooks, there is no problem. When our child was a baby my husband bathed it and I dressed it, etc.” (F2, session 3 *FGI*).

The respondents claimed that partnership should not be based on a stiff and artificial division of duties. They rather inclined towards replaceability meaning that a particular housework activity or action relating to childcare is performed by a person who is currently at home, who is available or less tired, etc. Few interviewed parents noticed that some divisions are difficult to avoid, they are natural, because one does something better than the other or prefers to fulfill certain tasks. For instance, bathing a child turned out to be the fathers’ domain, whereas women more often changed nappies. Moreover the division of duties is dependent on the type of professional work and the amount of time it engages.

“Since my son was born I have been close to him and I think that I and my wife take care of him equally. I participated in the childbirth process, I held the baby first and I had no problem, no fears. From the beginning I practically did everything when my wife didn’t feel well after the delivery. So all things related to child and childcare are natural for me and I can say that we share it equally. Of course, each of us does one thing better, another one worse, but we cooperate and replace one another, and it works” (M3, session 2 *FGI*).

Furthermore, many underlined that any divisions of duties in their families are a result of a contract, a common decision, or a solution worked out together. They treated it as natural effect of building their relationship and cooperation in everyday life. In accordance with conclusions from an investigation conducted among Finnish fathers, “parental responsibilities are often negotiated and reproduced implicitly, the shared understandings and common everyday practices of doing motherhood and fatherhood are developed gradually and almost unobserved” (Lammi-Taskula, 2008, p. 145).

“We have chosen together the model of family in which the mother is responsible for a child and the father is the breadwinner” (M22).

“It is a matter of contract. We have accepted a relationship based on partnership” (M5).

“It was our common decision that my wife stays at home with our son and I work” (M2).

Many couples in which both spouses worked professionally tried to ensure that each of the parents had the opportunity to spend time with an infant.

They shared the time and looked after the child in turns or they enjoyed parental duties together.

It is worth noticing that for many interviewed fathers child minding, nurturing, feeding, bathing, etc. seemed a natural and obvious activity. They rejected a conviction that it is a mother's task to take care of the children. Many fathers stressed the importance of staying with their children and being involved in everyday care in order to build a close relationship and deep emotional bond with a child.

"Since the first day, when our daughter arrived at home, I was the first to change her nappy and I did not see anything wicked about it. I wanted to learn how to do it. It was natural for me and it gave me a lot of joy and satisfaction. Later, taking a day off and giving the sick child medicine was no problem. There was no such principle as <you have to take a day off because you are the mother and you should take care of the child>. No, we always came to an agreement. If I was able, I went for a leave. I was with the child and it was great because it was some time for me and my daughter only. And we became friends because we had to rely on each other and to cope with difficulties and problems together." (M2, session 4 *FGI*).

"As I found out that my wife was pregnant I accompanied her to a doctor, I attended a childbirth school, I read to the child, I practically did all I could. Just when my child was born it became a part of me and my life. I have no fear, no resistance. (...) This is my child and I look after it. That's all." (M3, session 3 *FGI*).

The interviewed group of Polish young well-educated parents did not give unanimous opinions about 'sameness' versus 'difference' of parental roles of women and men. On the one hand, they defined being a mother and a father by the same attributes stressing responsibility for child rearing and development, child education and protection, parenthood as a source of joy and satisfaction. On the other hand, they saw "natural" differences between maternity and paternity. Respondents noticed that also children differentiate the roles of mother and father and expect different features, attitudes and behaviour from each of them. According to them, the mother should be sensitive and tender, responsible for emotional development and supplying child's affective needs, whereas the father's role is more "educational" and "disciplining". Such findings related to fatherhood were presented also by R. Kay who had interviewed men from Russia (2006). To "father-oriented activities" belong such tasks as "transmitting skills to children", "providing discipline", "showing where the boundaries are", "installing values" (Jump & Haas, 1987, p. 102; Kay, 2006, pp. 132–136). Both Polish and Russian fathers stressed that paternity, just as maternity, is based on love for children

and strong emotional engagement. It is a sign of transition from the traditional perspective of fatherhood towards a “modern”, “new” type of fatherhood (Merla, 2008).

### 3.2 Difficulties in implementation of equal parenting

As mentioned above, the great majority of interviewed couples tried to realise the model of family based on partnership. However, introducing the model into practice was not always successful. The most frequently mentioned barrier turned out to be the time-consuming and absorbing character of professional work of one of the parents.

“It should be generally like this (partnership in family), but sometimes it is impossible. For example, my husband spends at work almost the whole day at work and I have to deal with all duties myself. Sometimes it’s difficult to share duties and they must all be done by one person” (F3, session 4 *FGL*).

Mothers staying at home because of maternity leave or upbringing leave were naturally more burdened with domestic and parental duties than their professionally working husbands. In such families the father’s activity was sometimes limited to spending up to two hours with the child in the evening and during weekends mainly on plays and games, and eventually accompanying the child’s bath. These men were conscious of being rather inactive and as an absent father only supported the spouse in her parental role.

“To be honest, in a week I spend with our son as much time as his mum in one day. In fact, I am a father only for two hours a day. And that’s it” (M2).

“The mother’s role is primary and the father only supports her” (M22).

“The father’s role is to be nearby, to provide for the family, and that’s my role” (M19).

It seems that the essential barrier in realizing the idea of equal parenting is limiting the fathers’ engagement and allowing women time for all the child-care – “because they will do it better and more quickly”. According to C. Gatrell, “while fathers’ involvement with children is perceived as beneficial by some mothers, others regard it as a threat to maternal status” (2007, p. 351). Polish mothers who participated in the research were aware of the fact that such a situation is unfair and disadvantageous both for them and for the children in the long term. Men give up, if they are forced to compete with

the mother in order to participate in childcare. They often have no chance to learn how to look after a child and thus women receive no support from them.

“It is a terrible mistake. Mothers do harm to their children by taking over all the duties” (F8, session 1 *FGI*).

However, some also admitted, that they use women’s officiousness and desire to be “the first parent” and to do everything related to child rearing, because “they know it better and nobody can do it as well as they themselves” (M7, session 2 *FGI*).

Many of the male respondents believed that it is more difficult for men than for women to create an emotional relationship with a child. According to their statements, mothers are in a better and privileged position because of pregnancy, breastfeeding and more frequent physical contact. An emotional bond between mother and child is natural and as a rule fathers have to make an effort to build a similar bond. Moreover, women can limit the father’s access to a child and its upbringing. Such a tendency was observed in other research on men’s engagement in childcare – “mothers’ attitudes about father involvement were positively related to the father’s accessibility to children and the percentage of time the father served as the child’s primary caregiver” (Lee & Doherty, 2007, p. 78). The conviction, that father’s involvement in child-minding is dependent on the mother’s attitude was expressed by one of the interviewed men:

“From the beginning because of pregnancy and breastfeeding it is a special mother-child relationship, and the father is somewhere nearby. It is difficult to enter this mother-child world. It depends, whether a mother makes it possible for a father. If I hadn’t had my wife’s support, it would have been very hard” (M11).

Interviewed mothers observed also that their husbands engaged in childcare more easily and willingly when the child was getting older and was able to walk, talk, play actively. Fathers’ reports confirmed this, because according to a significant number of them said, it was a lot easier to build a relationship with an older child (over one year of age).

Summing up, it seems that parenthood based on partnership becomes a more common and natural phenomenon as well as an obvious relationship pattern among many young, well-educated couples. However, it has been observed that equal parenting does not mean equality in household work (cooking, washing, cleaning, ironing, etc.), yet, which remains a women’s domain in Polish families (Titkow et al., 2004).

### 3.3 Taking the parental leave

Interviewed parents claimed that they negotiated the circumstances of taking a childcare leave and mainly the choice who would be the benefit user and stay at home. Most important for the decision making were, in their opinion, economic reasons and to be precise the mother's lower income. When both parents earned same or comparable salary the reason for the preference of maternity leave was due to the mother's allegedly higher performance in childcare, especially in the child's early years. Crucial arguments raised here included breastfeeding and the problem of separating mother and child after the leave because during that period a very strong and close relationship is built.

Consequently, men usually declared that taking a paternity leave would not be troublesome or inconvenient in terms of their workplace. Despite the eagerness declared, they showed some concern being aware that managing all duties together with housework is not an easy task. They stated admiration and appreciation for their wives and parental leave users for being great home managers and mothers.

What may come as a surprise, there were situations where the father on a parental leave would be a problem for a woman. Some female respondents could not even imagine that their husbands might stay home with kids (taking a paternity leave) – “the child will be o.k., but at home there will be a mess” (F7, session 1 *FGI*). For it is the woman who is able to manage all domestic duties and take care of the children properly.

Fathers' statements confirmed that mothers are often reluctant to pass on part of the leave to a father, to agree to his custody over a child and to return to work. According to one of the mothers interviewed, even if women earn a bit more than their spouses, they rather do not allow the father replace to them in their role, because the mother “simply feels it is better for her, for the children and for a husband, if a woman stays at home and deals with all childcare” (F4, session 1 *FGI*). The stereotype that the mother is the primary and preferable caregiver is very strong and still valid especially among women in Poland. Their attitudes towards men on parental leave show that traditional, stereotypical ways of thinking about gender roles can be a serious barrier to implementation of the idea of equal parenting. On the one hand they declare that they expect active parenting and sharing parental duties from men, on the other hand they reject the idea that the parental leave is taken by the fathers. They explain that it is still something exotic and unusual in Poland and it would be mocked by the men's employers and colleagues. They express an opinion that men using a childcare leave and staying at home with a child must be indolent, passive and less masculine.

F6: A lot of guys do not decide to take a parental leave because they would be perceived as unmanly then. (...) If I met a man who uses a parental leave, I would ask him, whether he is so lazy that he prefers staying at home with a child to working professionally.

F1: It is a natural reaction. (session 1 *FGI*)

However, the same women stated that it is unfair that their work connected with taking care of children and doing the housework is not treated as “real, true work”. Moreover, they use the label of “housemen”. Interviewed men, however, didn’t share the stereotypical opinion about fathers on parental leave and declared that such a negative social reaction would not discourage them from using childcare leave.

Among participants of the study no father used a part of maternity leave. One male interviewee took 3 months of parental leave simultaneously with his wife. But it is worth mentioning that respondents declared that they knew families in which “woman and man exchange the roles – she works professionally and he is the child-minder”. Defining such a situation as “exchange” or “reversal” of gender roles shows that gender stereotypes and the division of labour are still deeply rooted in Polish mentality even among those well-educated Poles.

#### 4. Discussion and conclusion

The presented findings show a general tendency that is observed nowadays among dual-career, well-educated couples. “One of the major sociological consequences of dual-career families is the breaking down of rigid sex roles for males and females” (Jump & Haas, 1987, p. 111) which has a reflection on gender relations in family, that more and more often based on the idea of equal parenting. In this family partnership model women tend to expect greater paternal involvement, although it is often difficult for them to give up the primary responsibility for child rearing. Men, however, aim to be active parents, assisting in childcare and building strong emotional relationships with children. Such a paternity becomes also an important component of masculine identity. One may assume that young, well-educated Polish fathers have become “modern fathers” – “active fathers” to a higher degree. All in all, according to T.L. Jump and L. Haas, “a new model of fatherhood has emerged that calls for fathers to join with mothers as equal partners in child care” (1989, p. 98).

In Polish society the thesis of J. Lammi-Taskula that “when childcare is understood as a shared responsibility, parental leave may be a ‘natural’ part



of doing fatherhood” is not confirmed (2008, p. 144). Family policy does not promote taking childcare leave by men. This proves that the implementation of the idea of equal parenting demands certain, considerable macro level support. It is also a field of activity for the mass media which should present not only traditional, conventional images of a family but also modern, differentiated patterns of masculinity and femininity, maternity and paternity.

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# **'Late divorces' in the lives of German women from three different birth cohorts – a lasting impact of World War II?**

## **1. Introduction**

German demographic statistics on the dissolutions of marriages reveal a gradual increase, a so-called “late peak”, of divorce rates after long-standing marriages. This is a rather new phenomenon that started in the early 1990 years of the last century. So far, the golden rule of predicting the duration of a marriage argued that the longer the marital relationship lasted the less was the risk of divorce. Yet, looking at the figures of 1995 this rule of thumb seemed to be not valid any more: in this year, 17 percent of the marriages that ended in divorce had lasted at least 21 or more years (Dorbritz & Gärtner, 1998; Federal Statistical Office, 1998). About fifteen years later, this rate rose to a substantial 24 percent, with break-ups after the silver-wedding anniversary (25 years and more) making up 13 percent of the overall marital dissolutions in the year 2009 (Federal Statistical Office, 2011). In this context, one has to keep in mind that quite a few of these couples who are now middle-aged or in late adulthood, respectively, still expected their marriages to last till death. Furthermore, most of the marital careers that started in the rather normative West-German years between 1955 and 1975 were characterized by traditional values and typical forms of a gender-specific division of labour. Thus, the increase of more or less sudden ends to rather long-lasting marital partnerships by divorce calls for more knowledge about this phenomenon and attempts to explain it by taking possible influential factors into account, e.g. gender, women’s choices, practices of socialization and processes of family development (Fooker, 2002; Lind, 2001).

## **2. Women’s choice or women’s fate? Developmental trajectories in women’s life span and their effect on marital distress and separation after long-standing marriages**

What is known about possible determinants of women’s ways of coping with marital distress and the break-up after long-standing marriages as far as their mental health is concerned? What do we know about early antecedents

in childhood and adolescence, whether vulnerabilities or resources, which might have a long-lasting impact on later life, e.g. attachment styles, intimacy and interpersonal and social behaviour? What do we know about women's subjective representations of a critical life event like a late divorce and its impact on their perspective of the future and their anticipation of old age? It is assumed that there is not only one typical way or pattern of ending up in a late break-up of marriage but that there are various developmental outcomes. In order to identify different significant patterns of female life trajectories in the context of late divorces it was decided to focus on *intra*-gender variability within a sample of divorced women as well as finding female forms of adaptation via *inter*-gender differences by comparing and contrasting divorced women's experience to male forms of coping with this event.

## 2.1 General sample, methods and research questions

This contribution refers to data of altogether  $n=65$  female participants who took part in a pilot study on *late divorces* (duration of marriage at least 20 years for the women born around 1950 and 25 years for the older participants). The study participants belong to three different age groups, i.e. they were either born (+/- 1 year) in 1930, 1940 or 1950. Thus, they were in their late or mid-sixties, late or mid-fifties or late or mid-forties when the study was carried out (from 1995 to 1998). The whole sample of this research project consisted of altogether  $n=125$  subjects and the purpose of the study (which was supported by the German Federal Ministry of Family and Senior Citizens) was (1) to describe the variability of life developmental patterns before and after a critical life event like a separation and/or divorce after long-standing marriages and (2) to identify (potential) risk groups regarding mental health aspects in the context of being or growing older (Fooken, 2006). Thus, standardized questionnaires of mental health status and competence/perceived personal control (Becker, 1989) were applied as well as in-depth oriented biographical interviews that stimulated a narrative discourse in order to get closer (1) at distal and proximal antecedents of this transitional event, (2) at concomitant circumstances as to personal attributes and social networks, and (3) at subjective representations and concepts of divorce which the participants developed in the course of coping and adaptation. As research on determinants of coping with late divorces has been (and still is) rather scarce (see Fooken & Lind, 1997) a broad theoretical approach was utilized (ranging from attachment theory, to concepts of stress and coping, cognitive and action theories etc.). Accordingly, the interviews covered a wide range of life-span developmental topics and issues beginning with

childhood experiences in the family of origin, early attachment styles, school attendance and achievement behaviour, the forming of one's identity in adolescence, launching, dating and mating, courting, marriage, family planning, career and family development, partnership, conflicts, social network and support, anticipation of separation, coping with divorce, future time perspective etc. (Fookien, 2002; Lind, 2001). Due to the narrative approach that was applied in this investigation it was possible to gather tentative evidence of the women's means and ways of 'taking stock' or summing up their life-situation after a long-standing but actually failing marriage (Fookien, 2004; Weiland-Heil, 1993). Therefore it was examined if the women labeled the late break-ups as either 'sudden breach of a former mutually shared consensus' or if they judged this experience as a lasting self-constructed 'illusion of consensus' or if the late break-ups actually were a result of 'early dissension' right from the beginning of the relationship. Last but not least, this phenomenon, of course, could also simply be attributed to what family sociologist label as 'normal disenchantment of late life marriage'. In any case, these subjective representations were related to mental health aspects and coping behaviour in order to gain more knowledge of the concomitants and consequences of late divorces.

## **2.2 Specific characteristics of the sampled three different female birth cohorts**

The decision to include different age groups was made in the first place to attain a certain degree of age variability within the sample of late divorcees. Yet, at a second look it became evident that sampling women who belonged to the three birth cohorts mentioned above (i.e. being born in 1930, 1940 or 1950) implied that they were contaminated' in one way or another with circumstances and the aftermath of World War II. Recognizing the influence of war-related issues on life-span and developmental experiences of the participants turned out to be something like a secondary effect in the course of being involved in such kind of research.

As far as childhood experience is concerned the n=20 women of the oldest age group (born in 1930) can be labeled as so called '*pre-war children*': In spite of the political circumstances which were rather tense and stressful at the time they were born these women still had a more or less normal and rather peaceful childhood. As their parents were older compared to the parents of the other two groups (and as most of the fathers were no active soldiers anymore) most of these women grew up in more or less complete families even during war time. Although quite a few of them experienced

bombings and/or flight and expulsion, social losses, especially the loss of fathers, was not a typical experience of these women. At the time when the war was over they were adolescents. Thus, they were launched into young adulthood under circumstances of poverty and all kinds of others shortages and restrictions on the one hand, but they seemed to be kind of prepared to cope with most of these negative life conditions on the other hand. Yet, as women tend to marry men older than they are themselves, the whole domain of mating and courting proved to be quite a challenge for them: the female members of this birth cohort had to face a shortage of male partners because quite a few of the men who were slightly older than themselves had been either killed in action or were prisoners of war. Thus, when they married at last (mean age: 27 years) they were older and not in their early twenties like the women who were one or two decades younger. Furthermore, they often married men who had been drafted in the last months of the war as young adolescents and who returned back from war partly traumatized, often having no words for their horrifying and unspeakable experience. This very special state of mind (being more or less psychically disturbed and 'silent') proved to be a difficult starting-situation for developing mutual intimacy and satisfying partnerships on the one hand. On the other hand, all the members, men and women, of these pre-war birth cohorts were gradually launched into the socio-economic and societal recovery of the stressful aftermaths of war and into the years of the so called West-German *Wirtschaftswunder*. Almost all of these women got professional training and had work experience before they married but then married, had children and lived according to rather traditional marital arrangements regarding gender-specific division of labour. 55 percent of these women initiated the separation themselves after an average duration of their marriage of 29 years. Most of them had been living alone for a number of years already, when they were interviewed.

The n=23 participants of the 1940 age group can be labeled as 'war children' being born during the second year of World War II. About half of them experienced the longtime absence and/or definitive loss of fathers, and they also learned about bombings, expulsion, and disintegration of everyday and family life as very young children. Because of their young age they had only little verbal competence to express fears and other negative emotions and feelings so that most of them had actually no words to integrate these stressful, confusing and disturbing events and life circumstances into their own narratives about their biographies. Parents and adults at that time tended to regard them as children "who forget easily" and "play away" possible psychic confusion and sorrow. They were expected to be rather free of lasting traumatic reactions as they were mentally 'constructed' by their parents and the adult world as 'non-guilty' and 'innocent'. Furthermore, they also

were supposed to be obedient, diligent, faithful, hopeful, competent, achievement-orientated or to sum this up: they were delegated to realize their parents' aspirations and so make up for the lost and destroyed dreams of their parent generation. The launching phase into the years of emerging adulthood had been accompanied by the re-establishment of rather traditional values in (West-)German society especially with regard to heterosexual relations and sexual norms. Most of these women were educated and professionally trained, but married rather early (mean age: 23 years) and established young families right away, often because of pre-marital pregnancies (with 48 percent this rate was the highest compared to the other two age groups). Most of their spouses were 'war-children', too, a number of them having grown-up without fathers and thus being strongly bound to mothers and having no competent role models of a man or a father. This kind of family constellation often resulted in difficult marital partnerships right from the beginning. But although these marriages often turned out to be unsatisfying and troublesome, they lasted rather long until they finally broke up (mean duration of marriage: 28 years). As their children had already left home in most of the cases, the question can be raised why so many of these women still remained (and suffered) in obviously unhappy marriages. One answer found was: they had (unconsciously) waited for their old mothers to die. After the death of the last parental figure most of these women obviously were emotionally free enough for the actions that were necessary to finally terminate their unhappy marriages (70 percent of them were initiators of the separation). This phenomenon throws some light on the intergenerational frictions and problems that seem to be rather typical of members of these specific generations.

The n=22 participants of the youngest age group (born in 1950) are so-called '*post-war children*' who were born in the German post-war period. Similar to those of the other two birth cohorts they also knew of economic deprivation and the poor housing and living conditions that were still dominant in the post-war years. Furthermore, they had parents who were more or less socialized under Nazi ideology with regard to parental styles and family climate. On the other hand – compared to the other two age groups – they gradually experienced more favorable life circumstances during the time they grew up, e.g. a better access to a wealthier society, to advanced education and better opportunities on the labour market. Thus, the degrees of advanced education and qualified professional training were the highest in this sub-sample. Adding to this, the developmental phase of their young adulthood coincided with the historical period of youth- and protest-movements, the so-called '*sexual revolution*' and other kinds of emancipation processes. Yet, in spite of being closely affiliated to these life-styles of liberaliza-

tion their basic socialization was still dominated by rather traditional values with regard to family-life and gender-roles. Thus, they also married and established a family of their own rather early (mean marriage age: 23 years), often for the purpose of escaping from the firm obligations and behavioral norms they had experienced as children. But, different from the older groups, the duration of their marriages turned out to be shorter (mean duration of marital years: 21 years) as most of them were not willing to remain in obviously unhappy and unsatisfying marriages even when children were still living at home. Altogether, 60 percent of these women initiated the separation themselves and almost all of them actively resumed full-time jobs in the labour market.

### **3. Individual conceptions of the pattern of one's life, 'divorce careers' and mental health aspects**

Looking at personal conceptions of a transition, e.g. a rather late separation and divorce, there were three ways of subjectively 'explaining' what and why this had happened: Only 17 percent of the women sample conceived the separation as a more or less totally unexpected and arbitrary '*breach of consensus*' (compared to 35 percent of the male subsample of this project). Those women who evaluated the processes that led to divorce in this way judged the late break-up as something 'unfair' and unnecessary, as it happened to an efficiently and 'normally' working long-standing marriage that had been based on mutual consensus. As quite a few of the whole women sample had experienced a high amount of ambivalent feelings when choosing their future spouse it is noteworthy that the rather few women of this 'breach of consensus'-group had hardly any doubts about their partners as being 'Mr. Right' at the time of courtship and marriage. Thus one can understand that almost all of these women saw their partner as the one who definitely initiated the separation.

About one fourth of the women sample (23 percent) took a different view of their divorce: these women rather blamed themselves for a process of self-delusion. They started out with what they perceived as a definite and mutually shared selection of their mates at the time of dating and courting. Looking at what had really happened in the course of their marriages and how things had been going on in the process of separation they had started to consider the whole matter as a long-standing '*illusion of consensus*', which they finally understood clearly and terminated. There were typical statements like this one: "Actually, my husband did not change at all. In fact, he had been a lousy fellow right from the beginning. It actually was



my fault: I just did not want to realize this mismatch for a very long time". About one third of the oldest (35 percent) and of the youngest participants (32 percent) but only one woman of the 1940 birth cohort argued this way.

More than half of the sampled women (60 percent) arrived at the conclusion that the marital problems had already started with the choice of their mates at the beginning of their relationships. Looking back they explained the miserable course of their marriages with just having chosen the wrong partner. They experienced a high amount of ambivalence at that time, which often resulted in a three-fold pattern of (1) engagement, (2) disengagement and (3) re-involvement and marriage due to pre-marital pregnancies and/or pressure of partner or parents. Most of these women stated that they almost knew right away that this decision was a choice of the false partner or they realized very early in marital life that their relationship would develop into disenchantment and alienation rather soon. But somehow they kept on in their marriages and stayed in more or less troublesome relationships for different reasons. With this pattern we find 50 percent of the 1930 age group, 74 percent of the women born in 1940, and 55 percent of the youngest group. Almost all of these women (85 percent) who summed up their long-standing marriages in this way took the initiative and finally decided for separation and divorce.

Looking at mental health aspects as demanded by standardized questionnaires proved to be a different thing that calls for further investigation. Generally speaking, the whole female sample scored more or less below average but still belonged to the 'normal' range with regard to various different dimensions and scales of mental health (see Becker, 1989). On the other hand, it seems noteworthy that the women of the 1940 age group, the so-called 'war-children', were the only sub-sample that partly scored below the average range and thus yielded evidence of mental health problems in one way or another. This is especially true for depressive symptoms (see figure 1), but also for other aspects like problems of self-respect, rumination, low feeling of personal competence and high external control beliefs.

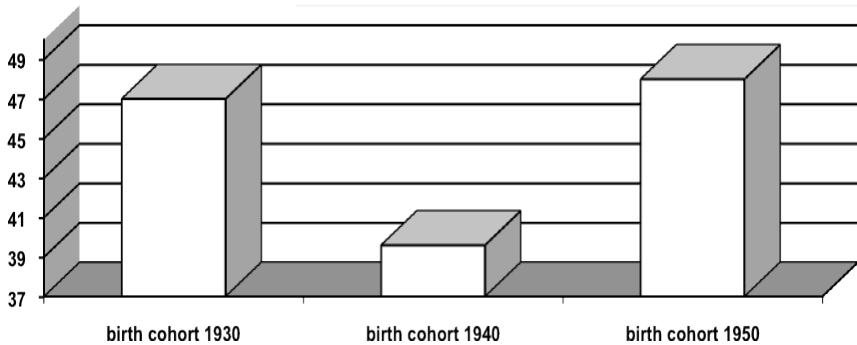


Figure 1: Feelings of worthiness vs. depression (T-scores) in the three birth cohorts of the female sub-sample

As there had also been other indicators of several kinds of hardship in the course of socialization and of a high amount of problems or of specific forms of stress and difficult conditions within this age group it makes sense to have a closer look at these women. On the one hand, a number of behavioral aspects that were found in the interviews showed them as rather ‘normal’: in most aspects they were either close to the older women or to the younger ones. But, on the other hand, there definitely are some remarkable exceptions that identify these women as a somehow special sub-sample. In their childhood they obviously suffered significantly more with regard to a lack of personal care as well as financial resources and they also experienced the least physical presence of their mothers compared to the other two groups. During adolescence they experienced a rather heavy burden and more stress within their families and other social relations and they expressed the least commitment as a ‘love style’ during courting time. In their marriages their conceptions of what makes up a ‘good marriage’ changed significantly due to experiences of high disenchantment and alienation. At the time they decided to separate finally they felt much more dependent on their partners for financial reasons and they were the least capable (and willing) to consider their partner’s perspective and his views on what had happened in their long-standing marriages. In fact, they attributed a high degree of life-satisfaction to their ex-partners and maintained a self-concept at the same time that saw them as experiencing little autonomy, being highly dependent, and feeling determined by physical problems and general disappointment. With regard to the anticipation of the future their plans were the least concrete, they expressed psychic defense and were least interested to cope with the issue of growing older

Somehow all these characteristics seem to be in line with the rather negative results of the 1940-born women in the mental health questionnaires. Yet, one of the most puzzling phenomena in the course of the interviews was the fact that the interviewers got the impression that these women were much better off actually and much more competent to cope with their everyday life situation than they had realized and openly conceded to themselves. This discrepancy became especially evident, because the male members of the 1940 birth cohort showed almost the opposite configuration: these men exhibited the highest mental health scores in the whole sample and were somehow eager to demonstrate that the divorce issue did not affect them in a substantial way. Yet the interviewers, on the other hand, saw a contrary picture and regarded them as the group that was highly at risk as to coping and other behavioral aspects of their life style. Are there any plausible explanations for this kind of paradox?

As this 'late-divorce study' took a lifespan developmental perspective the interviewees were, for example, asked about early attachment experience and further attachment careers during their marriages. Knowing that early attachment styles are highly associated with the caregiver's (i.e. usually the mother's) sensitivity towards the child's needs it might be questioned if this also applies to mother-child relations in times of war. There can be doubts if the subjects of the 1940 birth cohort really had good chances to develop a permanent secure attachment style, a sense of coherence and self-esteem when they were children as well as later on in other social relationships? Looking again at the circumstances of the childhood years in the three birth cohorts there seem to be significant differences between them. The oldest group describes rather undisturbed, peaceful pre-war childhood years which might have served as some long-reaching protective factor. Things were definitely different for the youngest group of post-war children, as they reported on rather miserable childhood conditions with tense, non-sensitive authoritarian parents. Yet, they obviously experienced other more favourable circumstances like the various liberation movements in the late sixties and early seventies, which they could use as a chance to develop self-determination, autonomy and independence from their parent generation, relational skills and a sense of coherence in their young adult years. All this does not apply to the children born during the war. Half of them experienced the loss or a long-lasting absence of fathers as well as other burdening and stressful war events. They probably sensed their mother's grief and exhaustion but were more or less denied to have feelings of sorrow and distress of their own. Often enough they were delegated to exhibit a kind of submissive adaptation, serving sometimes as partners or parental substitutes. In general, they were expected to be obedient, to work hard and to do their share of 'normaliz-

ing' the desolated world as soon as possible after the war was over. Thus, they married early, yet, without being clearly separated from their families of origin. Furthermore, they exhibited rather gender-specific ways of coping with the new challenge of developing mutual intimacy: The women suffered and were unhappy in their marriages and their (often mother-bound) partners obviously took everything for granted but expressed only little feelings of fondness and caring towards their wives. Looking closer at those participants who experienced the absence of fathers, again, reveals gender-specific conditions. There were three types of fatherless men: (1) 'mother-bound' sons who were submissively dependent on their mothers (their mothers' message can be characterized as: „You are my only ‚son‘-shine”), (2) 'mother-damaged' men who felt kind of abused and tried to get rid of their mothers by escaping into an early marriage with a partnership that was idealised for a short time, but followed by disappointment very soon, and (3) 'mother-damaged' sons who were kind of addicted to a life-long style of 'father-yearning'. On the other hand, all fatherless women proved to be 'mother-damaged' in one way or another, but coped differently with this burden in the long run compared to the fatherless men: they experienced high ambivalence when it came to the choice of a mate, they felt forced into a more or less unwanted marriage, suffered for a while, but gradually managed to free themselves from their unhappy circumstances, organizing a supportive social network and, finally, initiating the break-up themselves. Yet as the mental health questionnaires tell: They obviously still conceived themselves as kind of victims and as externally controlled with regard to many decisions and choices they made during their lives.

So the question remains: What were the reasons for the decision to divorce after almost thirty years of marriage or better: what 'triggered' this decision? It has already been stated: In most cases it was not the moment when the children left home – they had already left years before. It rather seemed to be the death of the last surviving parent (mostly the mother) which started a new partnership dynamic. And, again, there were gender-specific ways of coping with this loss: women tended to feel relieved and almost immediately 'rid themselves' of their husbands, as if they finally felt free to do this, whereas men often got into depression and expressed a complete lack of understanding of their wives' actions. The metaphor they used to describe their feelings was (literally translated): „I fell out of all clouds“. But the question that remains: Why did the women describe themselves as mentally disturbed and the men as mentally healthy in the standardized questionnaires? My explanation is like this: Both, men and women, were heavily burdened by negative childhood circumstances that could have made it rather difficult for them to develop secure attachment styles, a stable identity and a loving mar-

riage. Psychohistorians call this generation a 'silent' or 'forgotten' generation (e.g., Radebold, 2010). They were delegated by a more or less 'guilty' parent generation to establish normality, peace, harmony and 'innocence' as soon as possible. As girls/women or boys/men they had always been told what to think, what to feel, what is gender-appropriate and, on the other hand, what is forbidden to think, not allowed to feel, and no appropriate behaviour. In most cases they had been acting accordingly. Thus they were socialized to rather traditional gender-role orientations: men are 'cool' and strong, they do not suffer and, of course, are not broken' because a woman is leaving them. And vice versa: women also learned their lesson which told them that they had to endure what life planned for them and/or what men have done and do to them. In reality, things tended to be the other way, again. Most of the men were highly defensive when they had to cope with the narcissistic offence of having been thrown out by their wife and they desperately tried to keep up the illusion of mental health. And as to the women: Despite of still playing the part of 'poor me', quite a few of them finally developed some responsibility for themselves and for their choices and overcame their feelings of being a victim.

#### **4. Conclusion**

This contribution points to the necessity of putting lifespan developmental research into its historical frame of reference. It would have been easy to report on the results of a study on divorces after long-standing marriages by relating them to either prominent sociological or psychological theoretical presumptions and/or empirical data. Of course, there are good reasons to do research accordingly and, in fact, significant evidence has been revealed by it (e.g., Wagner, 1997; Fooker & Lind, 1997). On the other hand, when doing research on the lives of people, men and women, born in the twentieth Century it has to be kept in mind that these individuals will always be 'contaminated' with the issue of two wars, of its concomitants, consequences, and aftermath. These long-lasting impacts are by no means easy to detect, but they call for a sensitive and differential perspective. In my opinion there is no study on late divorces and on female development in general, as we do not live without historical contexts and its determinants.

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