CHANGING GENDER ROLES

The effect of the division of domestic labour on fertility in a context of gender equity

SUPERMOM

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Prologue

You are reading my master's thesis, the result of a two years educational program. With the completion of this thesis, I graduate university and am ready to join the labour market or continue within the field of research as a PhD student. The opportunity to go to the university and to fully realize my potential within the educational system makes me very different from my mom. She was never encouraged to go to the university. My mother completed a vocational training, which was already a lot more than my grandma, who went to the domestic science school.

My grandmother, my mother and I, are not so much alike in the field of education. This is also true for our professional careers. My grandmother stopped her job as soon as she got married to my grandfather, my mother, however, continued her part time job when she got married and when me and my sister were born.

Although my grandma and I have not so much in common, this is not the case for my brother, father and grandfather. My brother, like my grandfather, spend at least 40 hours a week running a small company and, like my father and grandfathers, spend time with his children over the weekend and in the evenings. Therefore, my brother has a life that is somehow comparable to my grandfather his life, while the path I took in my life is already very different from my grandmother's.

The lives of my family members resemble larger societal developments during the last century. Some scientific authors mentioned already that the lives of women changed a lot as a result of (and leading to) greater gender equity in the educational system and labour market. As a result of these developments, I am completing my university degree, while this was not an option for my grandmother. However, other studies show that the gender equity did not increase in an equal pace within families: women nowadays tend to do the main part of the domestic labour, even though they are more active in the public domain. Translated to my own family, that would mean that *if* my situation with my partner would resemble the average in the society, I will, like my grandmother, do the main share of the domestic labour and child care. These societal developments, so nicely mirrored in my own family, are the starting point of this thesis.

Chapter 1: Introduction

Gender equity is a model gaining influence in today's industrialized societies. The society at large is moving from a breadwinner's model towards a mode of gender equity (McDonald, 2000a). However, the unequal pace in which this move is happening in different institutions in the society leads to a discrepancy in gender equity between those different institutions (McDonald, 200a; 2000b). McDonald (2000a; 2000b) states that it is this discrepancy that causes the low levels of fertility in today's industrialized world.

The low Total Fertility Rates (TFR) at the macro level of the countries is directly linked to the childbearing behaviour of individuals in the society. If these individuals have fewer children and/or postpone having children, the TFR will be lower. It is through this childbearing behaviour that a discrepancy in gender equity might influence the TFR.

The discrepancy in gender equity might result in a double burden for especially women: they hold jobs, but also do the main share of domestic labour. Having children leads to an increase in the time spend on domestic labour (including childcare). For this reason women might postpone and reject having children or decide to have fewer children (McDonald, 2000a; 2000b). However, this mechanism might be true for some groups in the society, while it is not existing or different for other groups. A distinction between groups can be based on different characteristics, for example educational level, working status or gender ideology.

Within this master's thesis there will be studies whether the discrepancy between gender equity in the society and the family is indeed related to the number of children born. By testing it empirically in a multi-country study of 17 different industrialized and semi-industrialized countries, it will be possible to see whether this theory holds in a broad setting. Next, different groups will be distinguished based on gender ideology. It will be tested whether the relation between the discrepancy in gender ideology and number of children is different for people with a traditional-, transitional- or egalitarian gender ideology.

The structure of this thesis is as follows. First, the background of this study will be given in chapter 2. Next, the theoretical framework will be described in chapter 3, containing also the research questions and hypothesis. In chapter 4, various measures of gender ideology in the society will be discussed, followed by a description of the data and

methods in chapter 5. Chapter 6 contains an introduction and discussion of the variables included and the major assumptions made in this thesis. In chapter 7, the results are discussed. Finally, the conclusions and discussion are presented in chapter 8.

Chapter 2: Background

Gender equity can be seen as a feature of institutions (McDonalds, 2000a; 2000b). In this chapter changing gender roles in the various institutions of the *industrialized* world, are discussed (section 2.1). The changing gender roles led to high gender equity in many of the institutions. This is, however, not true for the family. In section 2.2, the division of domestic labour is discussed, followed by a discussion of the resulting 'double burden' of women in todays societies of the industrialized world (section 2.3).

2.1 Changing gender roles

The labour market is an important social institution, which experienced many changes through time. During many centuries, the society in Western countries was purely agricultural. Men and women worked together on the agricultural fields. Many houses had their own small piece of land attached to it, were families (both men and women) worked together to produce food for their own family. Therefore, the family home was a place of production as well as reproduction (Folbre, 1997). With the Industrial revolution, this typical way of living started to change: many men gave up their farm work and moved to the city to do paid labour in the factories, while women often stayed at home (Domosh & Seager, 2001; Rindfuss et al., 1996; Hochschild, 1989).

The relocation of production from the unit of the family to the society at large changed the nature of the society and the lives of people in it. This was, however, not equally true for men and women. During this period of Industrialization the lives of men were changing very rapidly, which gave them a very different position than their fathers and grandfathers used to have; men now worked for pay in a factory, while their fathers and grandfathers worked on their own fields to produce mainly food for their own family. The life of women on the other hand was not changing that fast as a result of the Industrial Revolution: they still worked in the *same place* as they used to: in and around their homes. However, the nature of the work they did often was different. Although some women still worked on the fields attached to their homes, not all families produced their own food anymore. The daily tasks of women changed. However, compared to men, women's positions remained more similar to those of their mothers and grandmothers (Hochschild, 1989).

The Industrial Revolution had implications for the role division within families. After the Industrial Revolution, many men went out to work to earn money, while their wives stayed at home to manage the household and take care of the children. This situation became to be seen as the *ideal* family situation during the Victorian times (Domosh & Seager, 2001). This situation was, however, not within reach of everybody. Poorer families could simply not afford that the woman stayed at home. The breadwinner's model of the family -in which the man earns the money and the woman takes care of the home and children- became the norm for especially the higher class society. The higher class society was quite a dominant group in the society. Consequently, the public sphere became to be seen as the domain of men (male sphere of life), while the home was seen as a typical female space (female sphere of life) (Domosh & Seager, 2001).

After the mid-twentieth century, the nature of work in many industrialized societies started to change from mainly production towards more service oriented. With the expansion of the service sector, more jobs became available for women. Increasingly more women moved into the labour force (Cooke, 2003), giving way to women in the public domain. The less physical nature of service jobs that came available with the expansion of the service sector gave way to the acceptation of more and also higher class women in the labour force. This development continued. As a result of stagnating male wages and rising prices (Rindfuss et al., 1996), the (additional) income of the woman became increasingly important for the family during the last decades of the twentieth century. These societal developments again fuelled the establishment of women in the labour force.

In other institutions of the society, gender roles also started to change. One of the main pressures to make this happen was the women's movement. The most well known result of the first wave of feminism in the Western societies at the beginning of the twentieth century, are voting rights for women (women's suffrage). These are often regarded to be the starting point for women's empowerment; no longer only men were seen as individual, but also women (McDonald, 2000a). Besides voting rights and the increasing acceptance of women in the labour market, women's participation increased in all forms of education. These changes are still ongoing today. 'Today, in almost all

advanced countries, women are educated to the same standard as men and, in many countries now, to a higher standard' (McDonald, 2000a: p4). Women are also an accepted part of the labour force in these countries. However, these days' women are often seen as a labour supply still not fully utilized. Therefore they are seen as a potential source when labour falls short as a result of ageing. This idea is increasingly formalized by governments and (international) institutions. For example, the Lisbon strategy of the European Commission (EC 2004), which states that women's employment should reach 60 per cent by 2010.

In sum; more than a century ago, society, in what is nowadays called the industrialized world, started to change radically as a result of the Industrial revolution. This resulted in a society where the public domain was regarded a male domain, while the home was seen as female. However, during the twentieth century the lives of women started to change: women moved increasingly into the spheres of life formally defined as male, for example the educational system and the labour market. However, the reverse is not true. Men did not move equally into the female spheres of life, like domestic labour and child care. The shifting gendered spheres during the twentieth century are graphically represented in *figure 2.1*.
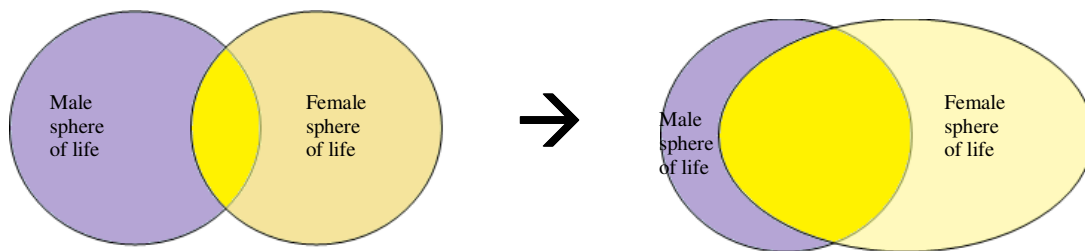
Figure 1: shift of gendered spheres during the twentieth century

2.2 Division of domestic labour

Responsibility for the domestic labour -including all the daily tasks like cleaning, cooking, laundry and child care- is traditionally part of the female sphere of life and therefore performed by women (Domosh & Seager, 2001). The statement that men did not move equally into the female spheres of life as women did move into the male

spheres of life, can be illustrated by the share of domestic labour men do. Although men's contribution did increase during the last couple of decades in the industrialized world (Bianchi et al., 2000), women still tend to do the majority of the domestic tasks (Bianchi et al., 2000; Coltrane, 2000; Couprie, 2007; Gershuny et al., 2005). Across the whole adult population, women often do at least twice as much as their male partners (Coltrane, 2000). The time spend on domestic labour by men and women, tend to become even more unequal when people start cohabiting, get married (e.g. Couprie, 2007) or get children (e.g. Bianchi et al., 2000).

Various explanations are given for the remaining unequal division of domestic labour. McDonald (2000a) argues that the family is a very important aspect of cultural identity. Therefore, it is a very "conservative institution" that does not change very rapidly but only very gradually. Just because the family does not change rapidly, it is able to maintain a cultural identity; if the family would change too rapidly it would undermine the shared identity of the society and therefore decrease feelings of safety (McDonald, 2000a). Therefore, a fast change of gender roles in the family would undermine the cultural function of the family. Other explanations are given by the gender construction theories. These theories state that men and women perform certain tasks, because these tasks will reproduce the 'gendered selves' (Coltrane, 2000). By some authors this is referred to 'doing gender' (e.g. West & Fenstermaker, 1995). For example, if a woman does specific caring or household tasks she can 'demonstrate to oneself and others that one is a competent member of a sex-category with the capacity and desire to perform appropriate gendered behaviours' (Coltrane, 2000: p1213). Furthermore, from the male perspective, the male identity is connected to men's role as provider and as such to the work they do. The female identity is to a far lesser extent set by the job they have. Therefore, the job of men will come first (Hochschild, 1989). Other explanations are given in the academic literature for the unequal division of domestic labour, varying from economic theories to psychological theories. Coltrane (2000), gives an overview of the existing theories in her article 'research on household labour: modelling and measuring the social embeddedness of routine family work'.

2.3 The double burden of supermom

Because in the industrialized societies women hold jobs, more things need to be done in the same 24 hours a day as before. Hochschild (1989) study towards dual earner families put this topic on the agenda. She stated at the end of the eighties of the twentieth century that society has speeded up, and as men do not contribute to the domestic tasks in an even pace, 'it is mainly women who absorb this speed-up' (Hochschild, 1989; 8). Absorbing the speed up, loads a pile of responsibilities on the shoulders of women (Hochschild, 1989): they have to perform good at work (to be able to compete with men who often do not have the responsibilities at home she has), have to take care of the children, take care of the household tasks at home and last but not least be a good wife for her husband. They need to be a 'supermom' (Hochschild, 1989). This situation formed the starting point of the discussion of the 'double burden' on today's women (e.g. Mills et al, 2008; Fuwa, 2004).

How do women and families manage to do it all? An answer formulated by researchers is that they try to cut back hours where possible. Bianchi, Milkie, Sayer and Robinson (2000) showed that the total number of hours spend on domestic labour are lower than in former times. Other ways to keep the number of hours down is to avoid or postpone living conditions that are likely to increase the time spend in domestic labour. Examples of such living conditions are cohabiting, getting married (Couprie, 2007) and especially getting children (Bianchi et al., 2000), as they are known to increase the time spend in domestic labour for women.

This can be a possible explanation of the low fertility numbers observed in many industrialized societies today, as having children not only increases the hours spend on caring and other domestic tasks, but is also seen as damaging for a career in the labour market (e.g. Sigle-Rushton & Waldfogel, 2007).

Chapter 3: Theoretical framework

This chapter contains the theoretical framework. The first section (3.1) contains a short background of low fertility and low fertility research. Next, two research questions are posed. The first research question about gender equity is derived from the theoretical framework of McDonald (2000a; 2000b), described in section 3.2. The second research question is derived from the combination of the theoretical framework of McDonald (2000a; 2000b) and the framing of gender ideology as proposed by Hochschild (1989) (section 3.3).

3.1 Low fertility

Fertility dropped low in most industrialized countries during the second half of the twentieth century. Low fertility is, not a uniquely Western phenomenon, as societies in East Asia experience very low levels of fertility as well. The current low fertility levels in industrialized countries vary from regular low fertility (± TFR of 1.7) to very low fertility (± TFR of 1.3).

The low levels of fertility became especially the topic of discussion in the context of an ageing society, because low fertility fuels the processes of ageing and population decline. Theoretically, when fertility levels are as low as 1.7, the population will be cut in half within the course of a century, when nothing else, like migration, compensate for the low birth rates (McDonald, 2000b; Morgan & Taylor, 2006). This means, for example, that the population of Germany, with a fertility level of 1.3, will be cut in half in less than 50 years time (Morgan & Taylor, 2006) if nothing compensates for the low levels of fertility in this country and the levels of fertility remain this low. Such a rapid decline of the population can in turn have serious consequences for the organization of the society. Not it the latest, because there will be far more ageing people than economically active people.

Since fertility levels dropped below the replacement level of 2.1[1], the topic of low fertility and its causes has been under the interest of researchers. Many different explanations have been suggested. One of the first explanations was economic change

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[1] An average of 2.1 children per woman in society is generally believed to be necessary to replace the current population. Two children, because the child is produced by two people and 0.1 to correct for mortality of the child before he or she got children him- or herself.

(e.g. Davis, 1937). Later, a changing value of children (e.g. Hoffman & Hoffman, 1973), opportunity costs of having children (e.g. Cooke, 2001; 2003) and the increasing numbers of women holding a job (e.g. Oppenheimer 1994; Rindfuss & Brewster, 1996; Brewster & Rindsfuss, 2000), were suggested as a theoretical framework to explain low fertility.

3.2 Gender equity & low fertility

The last decades, gender equity became gradually more important in theories explaining low fertility. The connection between low fertility and gender equity was first addressed by Folbre in 1983 and was further developed by Oppenheim-Mason (1997) and McDonald (2000a; 2000b; 2006).

McDonald (2000a; 2000b) sees gender equity as a feature of society's institutions and makes a distinction between individual oriented- and family oriented institutions. He theorized that there exists a discrepancy in gender equity within individual oriented institutions (e.g. educational system, labour market) and family oriented institutions (family itself, labour regulations) in the industrialized world. He states that this discrepancy leads to the current low levels of fertility.

McDonald states that the discrepancy in gender equity of the individual and family oriented institutions is a consequence of the societal developments during the last two centuries. He states that during the last two centuries, the Western society at large became increasingly more individual orientated (McDonald, 2000a; 2000b). Many institutions moved from a family orientation towards an individual orientation, but view institutions remained family oriented.

The individualizing institutions in the society gained gender equity. For example, at the beginning of the twentieth century, the educational system was focused on the family as central actor in the society. Men were educated, so they would be able to earn a family income. Girls were educated to be good (house)wives. However, this changed when women increasingly became to be seen, and started to act, as individuals. Women educational participation increased and they got educational levels up to an equal degree of men. Now, the educational system in the industrialized world educates individuals, regardless their sex, to fulfil their role as individuals in the society and not, as it used to be, to their (gendered) role within their future family. Other societal institutions that followed as similar development are the democratic system and the labour market, which

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are nowadays individual oriented institutions. McDonald states that today, gender equity in these individual oriented institutions is relatively high.

According to McDonald (2000a; 200b), one of the few remaining family oriented institutions in today's industrialized societies, is the family itself. He states that the gender equity in the family is very low compared to the gender equity in the individual oriented institutions of the society; women are still doing the major part of the domestic labour and this is changing very slowly.

The unequal development of individual oriented institutions and family oriented institutions, results in a discrepancy in gender equity. McDonald (2000a; 2000b) proposes that exactly this discrepancy in gender equity is likely to be an explanation for the low levels of fertility observed in industrialized societies, through the following mechanism:

> 'If women are provided with opportunities nearly equivalent to those of men
> in education and market employment, but these opportunities are severely curtailed by
> having children, then, on average, women will restrict the number of children that
> they have to an extent which leaves fertility at a precariously low, long term level'
> (McDonald, 2000a: p1).

After McDonald proposed his theoretical framework, researchers have continued to study low fertility in relation to gender equity. These studies towards gender equity and low fertility, without exception, take the division of domestic labour as a proxy for gender equity in the family. The effect of the division of domestic labour on fertility has insofar been empirically tested, by relating it to fertility intentions (Mills et al., 2008; Tazi-Preve et al., 2004) or the likelihood of a second birth (Cooke, 2004; 2008; Olah, 2003; Torr & Short, 2004).

The studies towards the division of domestic labour and fertility show that a more equal division of domestic labour, in the industrialized countries under study, positively influences fertility. Egalitarian couples more often have a second child than couples with a traditional division of domestic labour (Olah, 2003) and have higher fertility intentions (Tazi-Preve et al., 2004). Torr and Short (2004) found the relationship between the division of domestic labour and the chance of a second child, in the US to be not linear, but U-shaped. Couples with a traditional division of domestic labour (woman was doing

more than 84 per cent) or an egalitarian division of domestic labour (woman was doing less than 54 per cent), have a higher likelihood to have a second child than the group in the middle. This group in the middle is more likely to 'delay or forgo second births' (Torr & Short, 2004: p122).

In other the relation between the division of domestic labour and fertility, is entangled with a working mother, pointing into the direction of role conflicts rather than gender equity per sé. Cooke (2008) found in her study of Italy and Spain, that a working mother decreased the likelihood to have a second child in both countries. However, this effect was reduced in the Italian context by a father more involved in domestic labour. In Spain, on the other hand, the effect was reduced by private child care. This shows that in Spain contextual variables are more important. The study shows that the factors influencing low fertility can differ between countries: the specific context seems to be important in explaining low fertility.

Whether and how gender equity in individual oriented institutions is taken into account, differs between the studies. Mostly the studies take the influence of the gender equity in the society at large into account by comparing two countries with a different context, but comparable family patterns (e.g. Olah, 2003 in a comparison of Sweden and Hungary or Mills et al., 2008 in a comparative study of the Netherlands and Italy) or countries with a comparable context but different family patterns (e.g. Cooke, 2008 with a comparison of Italy and Spain). A different approach is to take the subjective perceptions of the societal inequalities into account (Tazi-Preve et al., 2004) instead of more 'objective' measures, like existing policies.

The studies show that a supportive context, where policies support having children, is found to increase the number of people having a second child (Olah, 2003 for the Swedish and Hungarian context; Cooke, 2008 for the Spanish context). Tazi-Preve, Bichlbauer and Goujon (2004), take the perception of gender policies and gender equity in the society into account. These perceptions do not have a significant relation to fertility in the Austrian context (Tazi-Preve et al., 2004). This observations point into the direction that it is not so much how people perceive the gender equity in the society that influences their fertility behaviour, but more the actual gender equity measured apart from people's own perceptions.

For various reasons, it is hard to conclude whether McDonald's (2000a; 2000b) theoretical framework is valid, based on the existing studies. First, none of the studies has taken the broader context (more than policies alone) of gender equity into account. Furthermore, no study takes more than two countries into account, which makes it problematic to generalize the conclusions to a broader context. This study tries to combine the different aspects in a cross-sectional approach. This leads the first research question and hypothesis:

Research question 1: What is the effect of the division of domestic labour between spouses on fertility in a context of varying gender equity in the industrialized and semi-industrialized world?

Hypothesis: The lowest number of children will be born in the situation where the woman is doing all the domestic labour, in a context of high gender equality.

Figure 2: Conceptual model first research question
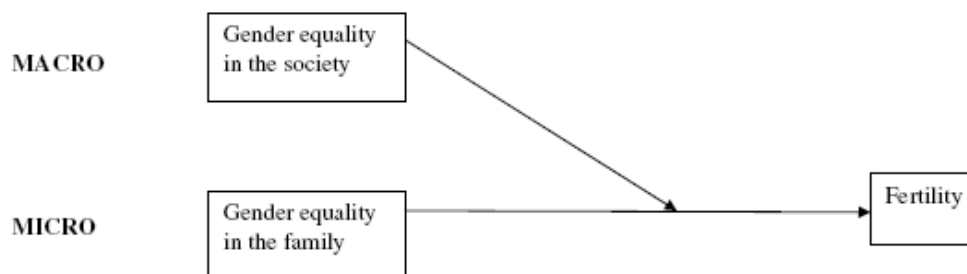
3.3 Gender equity, gender ideology & fertility

The theoretical framework developed by McDonald (2000a; 2000b) concentrates on societal institutions. Individual characteristics and preferences are not explicitly part of his framework. His story is a macro story. However, his theoretical framework is based on micro the level assumptions, that women who have to do most of the domestic work in a society with high gender equity in the educational system and labour market, will have fewer children. When this assumption is true for a relatively large group in the society,

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this micro level story is reflected in low levels of fertility at the macro level (McDonald, 2000a). Within McDonald's theoretical framework, no distinction has been made between groups in the society. If his theory only holds for certain groups and not for others, the micro level relation between the division of domestic labour and (number of) children will only show for these groups and not for others, even though the macro level relation at the level of the society might exist. In this scenario, individual characteristics will contribute to the explanation of the number of children.

One individual characteristic that is likely to influence the relationship between gender equity and fertility is gender ideology. Hochschild (1989) placed gender ideology central in the interpretation of her observations of her pioneering study towards dual earner families in the United States. In doing so, she distinguished three types of gender ideology: traditional, transitional and egalitarian.

McDonald (2000a; 2000b) did take gender ideology at the aggregate level of the society into account, when he stated that the society at large is moving from a breadwinner's model towards an egalitarian model. Within the breadwinner's model, the man is earning the money, while his wife takes care of the home and children. During the Victorian times the breadwinner model of the family was seen as the ideal family situation (Domosh & Seager, 2001). The breadwinner model was the dominant model until the 1970s. After this time, the ideal family situation started to shift away towards the model of gender equity (McDonald, 2000b). The model of gender equity states that specific roles, like house keeping, paid work or child care are not gender dependent. As such, it does not imply perfect equity between the man and woman in a heterosexual relationship; it is just that the division of roles is not determined by gender (McDonald, 2000b). This model has not (yet) been the dominant model in any recent time period.

These macro level models of the society relate to the micro-level gender ideologies of Hochschild (1989). People with a traditional gender ideology believe in the breadwinner's model of the family (McDonald, 2000a). People with an egalitarian gender ideology, however, believe the model of gender equity to be the ideal family situation (McDonald, 2000). People with a transitional gender ideology do have a mixture of two gender ideologies and are as such in the transitional phase between believing in the breadwinner's model and believing in the egalitarian model. As Hochschild (1989: p16)

states it: 'a transitional woman wants to identify with her role at work as well as at home and a typical transitional man is all in favour of his wife working, but expects her to take the main responsibility at home too'.

If people have a certain gender ideology, this does not necessarily mean that this is reflected in the division of domestic labour between them and their spouse. First, a living arrangement brings the gender ideologies of two people together. In the ideal case, the two persons share the same gender ideology. But, as Hochschild (1989) made clear in her book, many couples tend to be a mixture of two gender ideologies (the man has a different gender ideology than the woman), which makes it often impossible to live up to her your own gender ideology. Second, the practical circumstances might prevent you from acting on your gender ideology. For example, because of your traditional gender ideology you might want to be a full time home keeper. However, the economic state of your family does force you to hold a job. As this example makes clear, there can be a friction in the gender ideology and the actual circumstances of the person.

The effect of the division of domestic labour on fertility in a context of gender ideology might be different for people with different gender ideologies. The situation where a woman is doing all the domestic labour is likely to be more in line with the personal gender ideology of a woman with a traditional gender ideology, and therefore more acceptable, than for a woman with an egalitarian gender ideology. Such a friction between gender ideology and the actual division of domestic labour might influence child bearing behaviour. If a woman is doing all the housework, while she actually believes the housework should be divided between herself and her partner, it is possible that she will minimize the time spend on domestic labour in general. As mentioned before, children increases the time spend on domestic labour. An efficient way to prevent that the balance in contribution to domestic labour is even more in favour of the partner, a woman might postpone or cancel childbearing. On the other hand, if you do believe that it is your natural task to take care of the house and the children and you wish your partner involved too much, this effect on childbearing might not be as strong. This leads to the <u>second research question with one hypothesis</u>:

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Research question 2: How is the relation between the division of domestic labour and the number of children women have in a varying context of gender equity, different for groups with a traditional, transitional and egalitarian gender ideology in the industrialized and semi-industrialized world?

Hypothesis: The lowest number of children will be born in those situations where the women has an egalitarian gender ideology, but is nevertheless doing the major part of the domestic work in a context of high gender equity.

Figure 3: conceptual model second research question
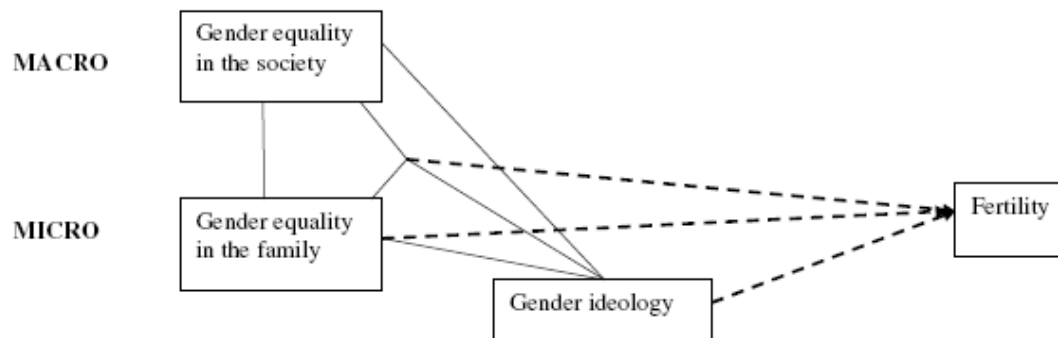
Chapter 4: Measures of societal gender equity

A central concept is in McDonald's theoretical framework this is the gender equity in 'individual oriented institutions'. He mentions the labour market and educational system as examples. Gender equity in those institutions is also referred to as 'societal gender equity'. There are various scales to measure gender equity in the society, all measuring gender equity in a (slightly) different way. No good comparison exists in the literature between the different indicators. Therefore here the Global Gender Gap Index (section 4.1), the Gender Related Development Index (section 4.2) and the Gender Empowerment Measure (section 4.3) are described, discussed and compared (section 4.4) in this chapter.

4.1 Global Gender Gap Index

The Global Gender Gap Index (GGG) is developed by the World Economic Forum. It is a combined measure including the gender equity in different domains, by measuring the *gap* between men and women in these domains. A wider gap indicates more gender inequity.

The GGG includes five domains. First it takes the gender equity in *economic opportunities* into account. Besides the equity of opportunity, the actual existing equity is taken into account with *actual economic participation*. Next, *political empowerment* is included, measuring the representation of women in all levels of the government. The GGG also includes gender equity in *health and well-being* as well as *educational attainments*. The gender equity in educational attainments is taken into account at the primary, secondary and tertiary level of the educational system. The indicators of all five domains are given in *table 4.1*.

The broad range of indicators the GGG includes in its measure of gender equity is both its strength and weakness (Mills, 2008). The wide range of indicators makes sure that many different areas where gender inequalities can occur are taken into account. Therefore it is unlikely that major gender inequalities are overlooked.

On the other hand, because so many different indicators are taken into account, it is harder to point out where the major gender differences occur and what the implications of the inequity are for different domains in society. If two countries have the same GGG value, it can mean that they are actual comparable in gender equity or that their mean

gender equity is the same but due to very different factors. Furthermore, more subtle gender inequalities are likely to be overpowered by major gender differences. For example, difference in health status between men and women in an important gender difference in developing countries, but in more developed countries is is of less importance. Therefore, because of the inclusion of all this different indicators, this measurement is especially helpful to compare countries world wide. It is, however, less suitable to compare countries that are more similar in some indicators, for example developed countries, but can very much differ in gender equity in other areas. These more subtle differences between more equally developed countries are "polluted" by the inclusion of so many categories.

Table 1: Dimensions and indicators of the GGG index

Dimension GGG	Indicators
Economic opportunities	- Weeks of paid maternity leave - Maternity leave benefits (% of wages paid in covered period) - Female professions and technical workers (as % of total) - Availability of government provided childcare - Impact of maternity laws on the hiring of women - Equity between women and men for private sector employment
Economic participation	- Ratio of female to male income - Female youth employment as percentage of male youth employment - Female unemployment as percentage of male unemployment - Differences in remuneration for equal work - Female economic activity as percentage of male activity
Political empowerment	- Female legislators, senior officials and managers (as % of total) - Number of years of a female president or prima minister in the last 50 years - Women in government at ministerial level (as % of total) - Seats in parliament held by women (as % of total)
Health and well-being	- Adolescent fertility rate (births per woman, age 15-19) - Infant mortality rate, per 1000 live births - Effectiveness of government efforts to reduce poverty and inequity - Maternal mortality ratio per 100.000 live births - Birth attended by skilled health staff (% of total)
Educational attainments	- Average years of schooling, females as % of males - Female to male ration. Gross primary level enrolment - Female to male ration. Gross secondary level enrolment - Female to male ration. Gross tertiary level enrolment - Adult literacy, female rate as % of male rate

Source: Lopez-Claros, 2005

4.2 Gender related Development Index

The Gender-related Development Index (GDI) is an adjustment of the Human Development Index (HDI) of the United Nations Development Program (UNDP) for gender equity in 'life expectancy, educational attainment and income' (UNDP, 1995: p74). The *ratio* is taken between the indicator calculated for men and the same indicator calculated for women to come to the GDI. This adjustment means that if gender equity is low in the domains mentioned, the GDI will be low compared to the HDI for that particular country: a country can score high on overall development, while it scores low on development taking gender equity into account (UNDP, 1995). Since 1995, the GDI is part of the range of indicators presented in the yearly Human Development Report of the UNDP. Table xx, gives an overview of the indicator making up the GDI and HDI (as the GDI is an adjustment of the HDI, they use the same indicators).

Like the GGG, the GDI is a useful measure to compare a broad range of countries, because it uses indicators from very different domains: it takes differences in life expectancy into account, as well as social equalities like educational attainment and income. The difference in life expectancy may be of higher importance to measure gender inequalities in the developing- than in the developed world. Therefore it is a useful measure to compare many different countries all around the world.

The broad range of indicators is at the same time its strength and the major drawback of the GDI. This broadness will cause problems for smaller comparative studies of countries of which the level of gender equity is not very different. For example, the ratings of countries in the industrialized world will be highly influenced by the life expectancy component of the measurement, while this is less relevant for this sub-sample of countries (Mills, 2008). The more delicate gender differences, which are still very important, are less well captured in this measure of gender inequity.

Table 2: Dimensions and indicators of the GDI

Dimension GDI	Indicators
Health	- Life expectancy at birth
Knowledge	- Adult literacy rate - Combined primary, secondary and tertiary gross enrolment ratio
Living standard	- GDP per capita

4.3 Gender Empowerment Measure

The 'Gender Empowerment Measure' (GEM) is another measure developed by the UNDP. Like the GDI, the GEM indicator was developed in 1995. Since this year, the GEM is reported every year in the Human Development Report. The GDI measures the expansion of opportunities, but the GEM wants to measure to which extent these opportunities are used to 'take advantages of the opportunities of life'[2]. Because it measures the advantages people can take (or can not take) of the opportunities of life, the term 'empowerment' is included in the name. The GEM indicator concentrates on three dimensions, namely 'women's participation on political decision making, their access to professional opportunities and their earning power' (UNDP, 1995:72). The indicators want to capture in numbers, to which degree women are empowered in these different spheres of public life (UNDP, 1995). Each dimension has its own indicators shown in table 4.3.

Where the GDI is a measure of the human capital women have in a particular society, the GEM concentrates on whether women really use and can use their human capital to their advantage (UNDP, 1995). This indicator has the power to show more delicate gender differences between societies as very crude differences, for example health status, are not included.

Table 3: Dimensions and their indicators of the GEM

Dimension GEM	Indicators
Political participation and decision making	- Share of seats in the parliament occupied by women
Access to professional opportunities	- Share of female legislators, senior officials and managers - Share of female professionals and women in technical positions
Earning power	- Estimated income of women compared to the estimated income of men

Source: UNDP, 1995

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[2] http://hdr.undp.org/en/statistics/indices/gdi_gem/, 26-08-2009

4.4 The gender equity indicators compared

The GGG, GDI and GEM all measure societal gender equity in a different way. That they do not measure exactly the same is illustrated by the different indicators and dimensions they use. That the indicators do not measure exactly the same is reflected in the ranking of countries from highest to lowest gender equity. Table 4.4 gives the ranks of the 30 countries with the highest gender equity for all three indicators. The same countries do not have the same ranking for all three indicators. For example, although Norway has rank 1 for the GGG and the GEM, Norway has place three for the GDI indicator. Furthermore, not the same countries make it to the top five for the three indicators. For example, Australia is ranked 2 for the GDI, but is not included in the top five of the GGG and GEM. So, although the GDI, GGG and GEM all measure gender equity, they do measure different things.

A closer look at the indicators making up the measures shows what these differences are. The GGG includes many different domains and indicators. It tries to capture the difference in status and opportunities of men and women of as many domains of the society as possible: it tries to capture the gap between men and women in the society. Both the GDI and the GEM include fewer indicators. However, the indicators making up the GDI capture very fundamental differences between men and women: health, income and education. The more subtle gender inequalities are better captured by the GEM, which focuses on the way in with both sexes can make use of their acquired human capital, by taking into account how women are represented in politics, the higher ranks of the labour market and the earning gap between men and women.

The theory of McDonald (2000a; 2000b) gives an explanation for low fertility in the industrialized countries, using the chances women have in education and labour market as part of the explanation. Therefore, a measurement is needed that included these opportunities women have. As the GEM includes more subtle differences in gender equity and takes into account how women can use their human capital, this indicator is best capable of capturing the gender equity as included in the theory of McDonald.

Table 4: Ranking of countries in 2008 according to GGG, GDI and GEM

Rank	GGG*	GDI**	GEM**
1	Norway	Iceland	Norway
2	Finland	Australia	Sweden
3	Sweden	Norway	Finland
4	Iceland	Canada	Denmark
5	New-Zealand	Sweden	Iceland
6	Philippines	The Netherlands	The Netherlands
7	Denmark	France	Belgium
8	Ireland	Finland	Australia
9	The Netherlands	Switzerland	Germany
10	Latvia	United Kingdom	Canada
11	Germany	Denmark	New Zealand
12	Sri Lanka	Spain	Spain
13	United Kingdom	Japan	Austria
14	Switzerland	Belgium	United Kingdom
15	France	Ireland	United States
16	Lesotho	United States	Singapore
17	Spain	Italy	Argentina
18	Mozambique	New-Zealand	France
19	Trinidad and Tobago	Austria	Ireland
20	Moldova	Germany	Bahamas
21	Australia	Israel	Italy
22	South Africa	Hong Kong, China	Portugal
23	Lithuania	Luxemburg	Trinidad and Tobago
24	Argentina	Greece	Costa Rica
25	Cuba	Slovenia	Lithuania
26	Barbados	Korea	Cuba
27	United States	Cyprus	Switzerland
28	Belgium	Portugal	Israel
29	Austria	Czech republic	United Arab Emirates
30	Namibia	Barbados	Barbados

* *Source: Hausmann, Tyson & Zahidi, 2008*

** *Source: UNDP, 2007*

Chapter 5: Data & methods

In this chapter the data and method used to analyse the data are discussed. First, the data is discussed in section 5.1. However, to be able to answer the research questions stated in the theoretical framework, the dataset needed to be reduces for both theoretical and practical reasons. This is discussed in section 5.2. The concept of 'division of domestic labour' in the analysis, as mentioned in the theoretical framework, led to a causality problem. Next, the countries included in the analysis are discussed (section 5.3), followed by the statistical method used (section 5.4).

5.1 Data description

The data from the International Social Survey Program (ISSP) is used. This is a continuing annual program performed by a collaboration of many different industrialized and semi-industrialized countries (each represented by a research institute) around topics relevant for social research (ISSP, 2004). Every year, the study focuses on a specific topic and the topic of the questionnaire is repeated once in a while. This approach results in cross national as well as cross time data.

The specific module used is the 'family and changing gender roles' of 2002. This is the third repetition of this topic. The first two surveys with this title where held in 1988 and 1994 (ISSP, 2004). The survey of 2002 contains information about 30 countries. For each country included in the program, the questionnaire was translated in the main language(s) of the country, after it was first developed in British English (ISSP, 2004).

The method of sampling and interviewing used is not the same for every country included in the dataset. This is a logical consequence of the collaborate organization of the ISSP. The questionnaire is developed by all the research institutes together, but the data collection itself is performed by the research institutes. Most countries used some kind of multistage sampling. The method used varies from questionnaires send by mail to face-to-face interviews and a combination of these two methods[3].

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[3] Detailed information can be found on the website of the ISSP: www.issp.org

5.2 Selection of the respondents and countries

The selection of the respondents is based on three individual characteristics: being a woman, being 40 years or older and living as married (cohabiting or married). Table 5.1 shows how the number of respondents was reduced with every criterion.

It is common for studies analyzing fertility to focus exclusively on women (reduction of 20683 respondents). The reason is the information on the number of children a woman gave birth to during her life is more reliable than information of men, as men can have children without knowing it. Furthermore, the time period in which a woman can have children is enclosed by two events: menarche and menopause. After this time, a woman cannot have children anymore. Men on the other hand can get children during a much longer period of their life.

Because of the menopause, the selection of the respondents was reduced to women of 40 years and older (reduction of 11587 respondents). This selection criterion was based on the assumption that for the large majority of women the reproductive career has end by this age. Only very few will still have (another) child. For the fertility measure it is necessary to have women at the end of their reproductive life span, as only then it can be said how many children they had in total.

The first two selection criteria were based on the concept 'fertility'. The third selection criterion 'living as married' is based on the concept 'gender equity in the family' and its proxy 'division of domestic labour'. This means that all divorced or widowed women were excluded from the dataset (reduction of 5401 respondents). This was necessary as the questions asked about the division of domestic labour were asked for the time period of the interview (2002) and not for the time period when the respondents made their decisions about having children (up to fifty years before this date). Here the assumption is assumed that the division of domestic labour now roughly reflects the division of domestic labour around the time when decisions of having children were made. Most women in the dataset do the majority of the domestic labour, it the assumption is made, that this was also the case when they had children or they were even doing more at that time, but certainly not less. This assumption, of course, will not hold for widowed or divorced women, as their current situation is far from the situation around

the time when they made decision about having children. For this reason, they are excluded.

For practical reasons, the dataset was reduced a little bit more. Respondents who did not answer the questions about the division of domestic labour were excluded from the analysis (reduction of 244 respondents). Furthermore, not in every country included in the dataset, the question about the total number of children a person had during his or her life was asked. Furthermore, not for every country a GEM value was available for the year 2002. For these two reasons, the number of countries included in the analysis was reduced from 34 to 17 and the final number of respondents was reduced to a total of 4228.

Table 5: reduction of the dataset

Selection	*Respondents*	**Countries**
Complete dataset	46638	34[1]
♀	25955	34
♀, 40+	14368	34
♀, 40+, living as married (LaM)	8967	34
♀, 40+, LaM, housework complete (H complete)	8723	34
♀, 40+, LaM, H complete, fertility question & GEM	4228	17

1. East- and West Germany are counted as one country, as the data was collected in 2002, after the reunification.

5.3 Countries

More countries than the "standard" European low fertility countries are included in the analysis, to be able to test the theory in a broad perspective. The final dataset contains: Russia, Republic of Chile, Hungary, Philippines, Japan, Latvia, Czech Republic, Slovenia, Poland, Israel, Portugal, Spain, Flanders (Belgium), Switzerland, Austria, Australia and the United States of America. Unfortunately, the Scandinavian countries, as classical example of high gender equity countries could not be included in the dataset, as a result of lacking information about the number of children of the respondents.

5.4 Methodology

Multilevel modelling (Snijders & Bosker, 1999) is used to examine whether the effects of division of household labour on fertility differs by country and whether those differences can be explained by country level gender (in)equity (GEM). The clustering of the data in

seventeen different countries makes it necessary to use multilevel analysis instead of OLS regression analysis. This is the case, because OLS regression analysis assumes that all the observations are independent from each other. This assumption does not hold if the data is clustered (in countries). Multi-level analysis takes this clustering into account, which leads to more valid results. Because the explained or outcome variable is a count variable a specific kind of HLMs need to be used, namely Poisson multilevel analysis (Twisk, 2006: 52).

The Poisson multilevel analysis differs from regular multilevel analysis in a way that the logarithm of the outcome variable is used. Therefore, it is comparable to log linear analysis, only in a multilevel variant. Furthermore, the parameters are estimated with quasi-likelihood, therefore (in contrast with standard hierarchical linear models) the -2 log likelihood can not be estimated (Twisk, 2006).

Chapter 6: Variables

In this chapter the operationalisation of the concepts included in the theoretical framework are discussed. Some concepts are operationalised by using one variable, others are a combination of several variables together, to be able to capture the various dimensions of a concept. This chapter starts with a discussion of the dependent variable 'total number of children' (section 6.1). The operationalization of all the independent variables: 'GEM' (section 6.2), 'division of domestic labour' (section 6.3) and 'gender ideology' (section 6.4), led to causality issues. These issues, and the assumptions that need to be made as a consequence, are discussed in sections 6.2.1 (GEM), 6.3.1 (division of domestic labour) and 6.4.1 (gender ideology).

6.1 Total number of children

The dependent variable is the 'total number of children' the respondent ever had. The respondents had to answer this question in exact numbers. It differed between countries how the answer was noted down in case of a high number of children. In some countries, the group of women with many kids was grouped under '8 children or more', while in other countries the exact number was noted. To make the data comparable, the variables are recoded in such a way that all 8 and higher order births were grouped under '8'. Therefore the categories from the variable ranged from 0 (no children) to 8 (8 children or more). The exact distribution of the answer categories can be found in appendix 1.

6.2 GEM

The indicator used in this study to capture gender equity in the society is the Gender Empowerment Measure (GEM) of the UNDP. In chapter 4, the GEM was discussed at length. The GEM indicator ranges from zero to one, where 0 indicates no gender equity at all and 1 indicates perfect gender equity.

6.2.1 Assumption GEM

More difficult is the GEM variable. In this study, the GEM values of 2002 are used. These values do not necessarily reflect the societal gender equity at the time of childbearing of the respondents. This is especially true for the older respondents included in the study. It can be argued that is mostly the relative differences in GEM that matter

for the analysis, rather than the absolute value. However, this assumption would lead to the next assumption: the societal gender equity developed in an equal pace over time in every country included in the study. Only when this is true, the relative position in societal gender equity between the countries in 2002 would reflect the societal gender equity during the time of child bearing. This assumption probably does not reflect the reality. However, this can not be controlled, as the GEM was only developed in 1995. No other solution for this causality problem comes to mind. Therefore, this very strong assumption has to be kept in mind when interpreting the results of this study.

6.3 Division of domestic labour

Like other studies on gender equity and fertility, in this study the division of domestic labour serves as a proxy for gender equity in the family. This variable is a combination of different questions of the questionnaire. The variables included in the measurement of the division of domestic labour were about the performance of daily tasks. The specific daily tasks included are: cleaning, cooking, grocery shopping and doing the laundry.

Other questions, like 'doing small repairs', were excluded from the scale, because they are not tasks that needs to be done on a daily basis. One can argue that this selection criterion will make the combined variable more gendered, as it is particularly these tasks that are often performed by men. However, the fact that it is these kinds of things that men contribute is exactly at the very heart of the gendering of the division of domestic labour. Small repairs are not a daily duty and can be done in a time the person finds suitable. Therefore, the pressure from these tasks is a lot less than from daily tasks, like cooking, which have to be done every day on a specific time. Unfortunately, no questions about *caring* tasks were included in the questionnaire.

To create the combined variable 'division of domestic labour', first all the questions were recoded from 1 (man is doing everything) to 5 (woman is doing everything). The value three meant an equal division of the task[4]. Next, all the questions were added up and divided the score by 4, resulting in the final variable: division of domestic labour.

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[4] When a task was outsourced to somebody outside the family, the variable was coded three (equal), as the tasks were not adding to the domestic labour to be done by any of the spouses.

6.3.1 Assumption division of domestic labour

One strong assumption is made regarding the division of domestic labour. The division of domestic labour was measured at the time of the interview (2002) and not during the time the respondents got their children. As the sample of women included in the study is restricted to women of 40 years and older, this can be quite a while ago. Nevertheless the assumption is made that the division of domestic labour at the time of the interview reflects the division of domestic labour at the time of childbearing. This is supported by the fact that in every country included in the study, women, on average do the majority of the domestic work. This means that most women do the majority of the domestic work. I assume that when the time of childbearing is a long time ago, and the children left the house, the division of domestic labour will more likely be more equal now than more unequal. In other words, if the woman is doing more a long time after the birth of children, she will most likely have done so during the childbearing years, as studies show that the birth of children causes the division of domestic labour to become more unequal (Bianchi et al., 2000). In this case, the division of domestic labour at the moment of the interview is more likely to *under*estimate the inequity in the division of domestic labour than overestimate it. That would mean that the relation is in reality stronger than reflected in this study. This is a less serious error than an overestimation would be.

6.4 Gender ideology

The variable 'gender ideology' is a combined variable containing responses to the following questions: 1) 'A job is alright, but what women really want is a home and children' 2) 'Being a housewife is just as fulfilling as working for pay' 3) 'A man's job is to earn money; a women's job is to look after the home and family' 4) All in all, family life suffers when the woman has a full-time job' and 5) 'A pre-school child is likely to suffer if his or her mother works'[5]. The responses are given on a scale from 1 (strongly agree) to 5 (strongly disagree).

The variables are summed and divided by 5. The missing values are replaced by the predicted value of a regression function, predicting the variable 'A man's job is to earn money; a women's job is to look after the home and family' (variable 3), by the

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[5] These are the same variables Fuwa (2002) used to make her variable 'gender ideology'. Therefore, the two variables are comparable.

other 4 variables (variables 1,2,4,5). The final results are recoded into 3 groups: traditional (value 1 – 2.4), transitional (value 2.5 – 3.4), egalitarian (value 3.5 – 5).

6.4.1 Assumption gender ideology

The measurement of 'gender ideology' once more leads to a causality issue. The gender ideology of the respondents was measured at the time of the interview, rather than at the time they made decision about having children. Therefore, the assumption needs to be made, that the gender ideology of the respondents stayed stable between the time they made decisions about having children and the time of the interview.

6.5 Control variables: age and education

There is controled for *age* of the respondents, as the period of time when a woman was in her fertile ages might have influenced the number of children she got. Age was centred in a way that respondents of 40 years old (the youngest included) got a value of 0 and that each extra year was counted from this year onward. So a person of 55 years old got a value of 15. Finally, the control variable 'age' was divided into two groups: 'younger' (40 to 50 years) and 'older' (50+).

Finally, the *educational level* of both the respondent and her partner are added as control variables. The educational level of the respondent and her partner can be seen as a reflection of their social economic status. Especially earlier in the twentieth century, the educational level of the men turned out to be more important for the social economic status of the whole family than the educational level of the woman. Therefore, both are included. Educational level is coded into three levels: low, middle and high. The descriptive statistics of the control variables can be found in appendix 2.

Chapter 7: Results

In this chapter results of the analysis are shown. First, descriptives statistics at the aggregate level of the countries are given (section 7.1) to get a broad picture of what is going on at the macro level. In the sub-sections the macro level statistics 'GEM' (sub-section 7.1.1), 'average division of domestic labour' (sub-section 7.1.2) and 'average number of children' (sub-section 7.1.3), are discussed. Second, the different multilevel models (section 7.2) are shown, discussed and interpreted. In the third section (7.3), the log odds of the model representing the theoretical framework of McDonald (2000a; 2000b) are further interpreted.

7.1 Descriptive statistics

Here the country-level descriptive statistics of the variables included in the analysis are presented. Table 7.1 shows the GEM value of every country, the average arrangement around the division of household labour per country included in the analysis and the average number of children per woman per country. In the next paragraphs each of the main variables will be discussed shortly.

Table 6: Country-level descriptive statistics

Country	N[1]	GEM[2] 2002	Average division of domestic labour[3]	Average number of children[4]
Australia	287	0.76	4.23	2.7
United States	190	0.76	3.96	2.6
Austria	313	0.75	4.18	2.1
Switzerland	159	0.72	4.15	2.0
Flanders	308	0.71	4.16	2.1
Spain	486	0.70	4.43	2.4
Portugal	199	0.64	4.32	2.5
Israel	267	0.60	4.01	3.5
Slovenia	260	0.59	4.02	2.1
Poland	255	0.59	3.99	2.6
Czech Republic	242	0.56	4.21	2.0
Latvia	155	0.54	3.84	1.9
Japan	318	0.53	4.37	2.2

Philippines	185	0.52	4.21	1.9
Hungary	166	0.50	4.21	2.1
Republic of Chile	217	0.47	4.27	2.9
Russia	221	0.45	4.05	2.0

1. The number of respondents per country
2. The Gender Empowerment Measure ranges from 0 (low gender equity) to 1 (high gender equity).
3. The division of domestic labour ranges from 1 (man does everything) to 5 (woman does everything). A value of three indicates an equal division. The average of all respondents included in the analysis per country is shown.
4. The average number of children per respondents included in the analysis is given by country.

7.1.1 GEM

Table 7.1 shows that the GEM values of the countries included in the analysis range from 0.45 (Russia) to 0.76 (Australia and the United States)[6]. All other countries fall in between these values. The values mean that according to the GEM measure, in Russia the lowest gender equity can be observed, while the highest gender equity can be found in Australia and the United States. [7]

7.1.2 Division of house work

Table 7.1 shows the average score per country. In all countries included in the analysis, the women are doing more than their partners as no country has a score of 3 (equal) or lower (partner does more). The table shows that Spanish women compared to their partners, do most. The country with (on average) the most equal division of household labour is Latvia.

7.1.3 Total number of children

Figure 7.1 shows that most women in the sample had a total of two children during their life span. Very few had more than four children and a minority had no children at all. The

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[6] Separated analyses were run without the Republic of Chile and Israel, because they have very low GEM values compared to their total number of children (appendix 3 for a scatter plot of GEM*total number of children). However, this did not make a substantial difference for the results. Therefore, here the models including all countries are presented.

[7] In many studies the Scandinavian countries are mentioned as the example of high gender equity countries, unfortunately it was not possible to include these countries in the analysis because the question about the total number of children was not asked in these countries.

category of eight children is a bit larger than the category of seven children, which is because this category contains all women with 8 or more children.

The average number of children per woman per country can be found in table 7.1. The table shows that in Israel women get on average the most children and in Latvia and the Philippines the least. This is true for the specific group of women included in this analysis, so women of 40 years and older and married or cohabiting.

The average number of children per woman per country does not necessarily correspond with the TFR of these countries. This is because the TFR is a period measure, rather than a cohort measure: the TFR is not observed, but calculated out of the fertility rates per age group. Therefore a TFR includes fertility of all age groups, while the measure used in my thesis includes only women of forty years and older. On the other hand is the period TFR rather sensitive for behavioural changes, like postponement of children, while the measure used in this paper is not.
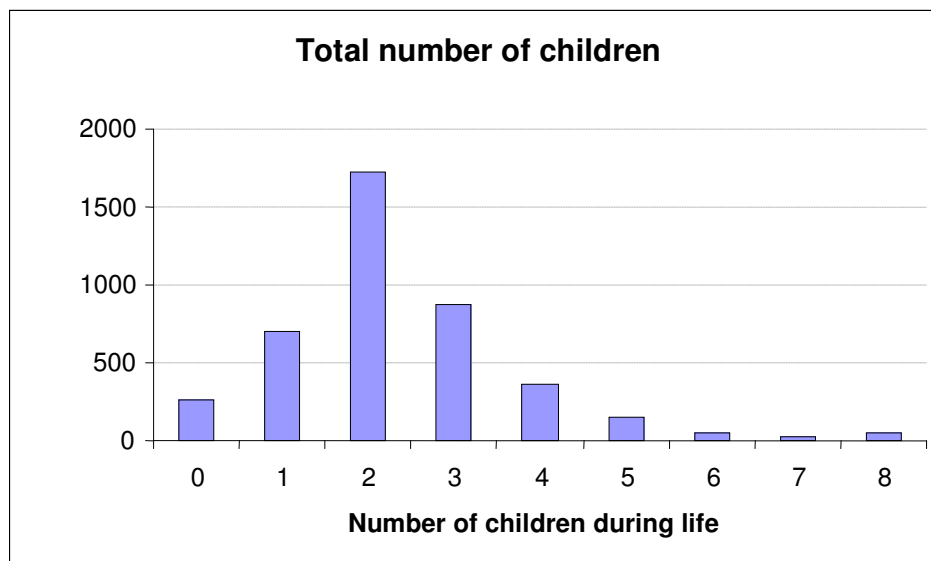

Figure 4: Total number of children

7.2 Multi-level models

In table 7.2 the results for the different hierarchical models are shown. The models are shown from very basic to more complex. The numbers are the log odd values and the numbers mentioned between brackets are the standard errors. As the outcome variable is

a count-variable, the models all follow a Poisson distribution. There is chosen to allow for a random intercept, but not for a random slope, because a random slope would mean that you allow the relationship between the variables to be different in every country. However, the aim of this analysis is to find out whether the theory is valid in all situations. This means that the relation between the variables should be the same in every context (country). For this reason, the slope is not random, but fixed.

The *first model* shown in table 7.2 is an 'empty' model. No explanatory variables are included in this model. In the models, the intercept is allowed to be different for the countries included: the model allows a random intercept. The empty model shows that there is a significant 'between country variance component' (0.030, $p<0.05$)[8]. This difference makes it important to take the clustering of individuals in the different countries included into account. This is taken into account by running a multilevel model instead of a simple linear regression model. This proves that it was a good decision to use multilevel analysis, instead of an ordinary least square regression analysis. The intercept ($ß_{0j} = 0.838$, $p > 0.05$) shows that the respondents got on average 2.3[9] children during their life.

The *second model* contains the control variables. Both the educational level of the respondent ($ß = -0.102$, $p<0.05$) and the educational level of the spouse ($ß = -0.049$, $p<0.05$) are significantly associated with the number of children people have. The higher the educational level, the lower the total number of children born. This is also true for the educational level of the spouse: the higher the educational level of the spouse, the lower the total number of children born. The age of the respondent is not significant, meaning that is does not matter whether the respondent was between the 40 and 50 or older than 50 at the time of the interview, for the total number of children the respondent had. Older people do not have significantly more or less children than people born later.

Within the *third model,* the explanatory variables 'division of domestic labour', 'GEM' and the interaction between these two variables, are added to the model. This is the model representing and testing the first research question. The 'division of domestic labour' ($ß = -0.147$, $p < 0.1$) is significantly and negatively associated with the 'total

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[8] Because I used a Poisson distribution, it is not possible to calculate the -2 log likelihood values. Therefore a simple Wald-test is used to check whether a value is significant or not.
[9] Exponent of 0.838 = 2.3

number of children'. The variable 'GEM' is not significantly associated with the total number of children, however, the interaction between 'the division of domestic labour' and 'GEM' (ß = 0.286, p < 0.1) is significant. The value is positive, this means that if women do more domestic labour compared to their partners and the contextual gender equity (measured by GEM) is also higher, *more* children will be born. This is the opposite of what the theory of McDonald (2000a; 2000b) would predict. Therefore, his theoretical framework is not supported by this model.

Within the *fourth model*, the variable 'gender ideology' is added in interaction with the other explanatory variables 'division of domestic labour' and 'GEM'. The variable 'gender ideology' is not significantly related to the total number of children. Neither are the two-way interactions (division of domestic labour & GEM, division of domestic labour & gender ideology, GEM & gender ideology) and three-way interaction (division of domestic labour & GEM & gender ideology). The insignificant three-way interaction means that the relation between 'division of domestic labour' in interaction with 'GEM' is not different for people with a traditional, transitional or egalitarian gender ideology. This means that the second research question is not supported. Furthermore, by addition the variable 'gender ideology', the other explanatory varaibles are also not significant anymore. All together, the fourth model shows that the theoretical model does not improve by adding gender ideology.

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Table 7: Results of the multilevel analysis; model 1,2,3 and 4

		Model 1	*Model 2*	*Model 3*	*Model 4*
Intercept		0.838	1.148	1.576	0.126
		(0.043)	(0.065)	(0.487)	(1.032)
Division of domestic labour (DDL)		-	-	-0.147	0.137
				(0.092)	(0.230)
GEM		-	-	-0.900	1.796
				(0.794)	(1.696)
Gender Ideology		-	-	-	0.735
					(0.535)
Interaction	DDL *GEM	-	-	0.286*	-0.229
				(0.150)	(0.387)
	Gender ideology * GEM	-	-	-	-1.366
					(0.862)
	Gender ideology * DDL	-	-	-	-0.147
					(0.126)
	DDL*GEM*Gender Ideology				0.262
					(0.203)
Control variables	Age	-	-0.015	-0.014	-0.021
			(0.022)	(0.022)	(0.023)
	Education	-	-0.102**	-0.100**	-0.089**
			(0.020)	(0.020)	(0.020)
	Education spouse	-	-0.049**	-0.047**	-0.049**
			(0.019)	(0.019)	(0.019)
Variance components	Between country variance	0.030**	0.036**	0.036**	0.038**
		(0.011)	(0.014)	(0.013)	(0.014)

** p<0.05
* p < 0.10

7.3 Interpretation of model 3

Model three is the translation of the theoretical framework developed by McDonald (2000a; 2000b), in a model that can be empirical tested. The results showed that the interaction was positive, with is the contrary from what would be expected based on the theoretical framework. However, all the values in the model are log odd values. Log odd values are difficult to interpret. Therefore the outcome for some hypothetical combinations of division of domestic labour and GEM are given in this section.

Table 7.3 shows the predicted total number of children for a range of fictional combinations of division of domestic labour and GEM. The values are the outcome of *equation 1*. The table shows that the relation between the number of children and the division of household work is not the same in every context of GEM.

Equation 1:
$$\text{Ln (Number of children)} = \text{ß}_{0}j + \text{ß}_{1j}*\text{HHwork} + \text{ß}_{2j}*\text{GEM} + \text{ß}_{3j}*\text{HHwork}*\text{GEM} + \text{ß}_{4j}^{2}*\text{HHwork} + U_{0j}$$

Up to a GEM value of 0.4, the lowest total number of children can be found in those situations where the woman is doing all the domestic work. However, in the hypothetical situation of higher societal gender equity (GEM $=<$ 0.6), the relation is reverse. In these situations, the number of children is higher if the woman is doing more. This again shows that the model shows exactly the opposite form what the theory of McDonald predicts; the more domestic labour women are doing compared to their spouses in a context of high gender equity, the higher the total number of children they will get.

Table 8: Interpretation of model 3

GEM / HH work	Lowest low (0.0)	Low (0.2)	Middle low (0.4)	Middle high (0.6)	High (0.8)	Highest (1.0)
Only man (1)	4.17	3.69	3.27	2.89	2.55	2.26
Man more (2)	3.60	3.38	3.16	2.96	2.77	2.60
Equal (3)	3.11	3.09	3.06	3.03	3.01	2.98
Woman more (4)	2.69	2.82	2.96	3.11	3.26	3.43
Only woman (5)	2.32	2.58	2.87	3.19	3.54	3.94

Figure 7.2 is a graphical illustration of the hypothetical situations represented in table 7.3. The figure shows that the relation between the division of domestic labour and the number of children reverses around a GEM value of 0.5. Below that point, the relation is negative and above that point positive. Furthermore, the figure shows that the contextual gender equity (GEM) is more important in the extreme cases of very low or very high gender equity and less important in the middle. This is shown by the steepness of the line, which are steeper at the extreme values of GEM and less steep around a GEM of 0.5.
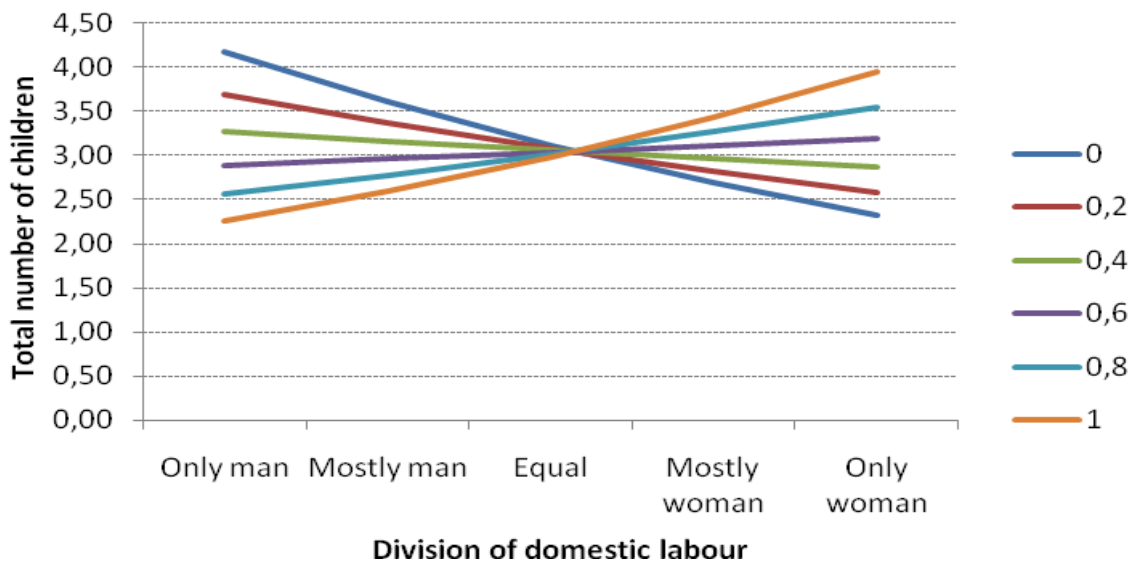

Figure 5: Graphical representation of the relationship between division of housework and number of children in different contexts of gender equity (GEM)

Chapter 8: Summary & conclusion

McDonald (2000a; 2000b) formulated a theoretical framework around gender equity and low fertility. He states that a discrepancy in high gender equity in individual oriented institutions and low gender equity in family oriented institutions, leads to the low levels of fertility observed in today's industrialized countries. In this master's thesis this theoretical framework is tested empirically by using multilevel analysis in a multi-country study of 17 different countries. In order to formulate a testable research question, the concept of 'gender equity in family oriented institutions' was made more tangible by translating it as 'the division of domestic labour within the family itself'. The concept of 'gender equity in individual oriented institutions' was translated as the 'context of gender equity'. Together this led to the first research question: *What is the effect of the division of domestic labour between spouses on fertility in a context of varying gender equity in the industrialized and semi-industrialized world?* McDonald (2000a; 2000b) theorizes that when women are doing the major part of the domestic labour in a context where she also gets educated and has the possibility to have a job, this situation would lead to low levels of fertility. Therefore, the first hypothesis was formulated accordingly: *The lowest number of children will be born in the situation where the woman is doing all the domestic labour, in a context of high gender equality.*

Fertility was operationalized in this study as the 'total number of children women had during their life'. The 'context of gender equity' was operationalized with the Gender Empowerment Measure (GEM) of the UNDP. The hypothesis predicted that the number of children will be *low* if the GEM is high and the woman is doing the domestic labour. Therefore a *negative* interaction effect was predicted. The *interaction* of the division of domestic labour and GEM turned out to have a significant and *positive* effect on the total number of children, while the main effects of both explanatory variables were negative. The *positive* interaction effect is the opposite of this prediction. Therefore, the first hypothesis needs to be rejected. Based in the results, the answer to the first research question is: the effect of an unequal division of domestic labour in favour of the man (woman is doing most or all), has a positive effect on the number of children in a context of high gender equity. In a context of low gender equity, however, this effect is negative.

Based on this results it has to be concluded that McDonalds (2000a; 2000b) theoretical framework is *not supported* by the empirical test performed in this master's thesis.

McDonalds (2000a; 2000b) theoretical framework makes no distinction between various groups in the society. In the second research question a distinction is made between groups with a traditional, transitional and egalitarian gender ideology. The second research question was formulated accordingly: h*ow is the relation between the division of domestic labour and the number of children women have in a varying context of gender equity, different for groups with a traditional, transitional and egalitarian gender ideology in the industrialized and semi-industrialized world?* By adding gender ideology, the basic theoretical framework of McDonald is extended. The expectation were formulated that McDonald's theory is especially true for women with an egalitarian gender ideology, while the relation can be different or non existing for women with a traditional gender ideology. This leads to the second hypothesis: *the lowest number of children will be born in those situations where the women has an egalitarian gender ideology, but is nevertheless doing the major part of the domestic work in a context of high gender equity.* The research question is translated to an empirical test, by adding gender ideology as an explanatory variable to the analysis, in (a three-way) interaction with the division of domestic labour and GEM.

The results show that the three way interaction of gender ideology, division of domestic labour and GEM has *no significant relation* with the total number of children. This means that the hypothesis needs to be rejected, it does not matter which gender ideology people have for the relation between division of domestic labour and fertility in a context of high gender equity. Therefore, the answer to the second research question is: the relation between the division of domestic labour and fertility in a varying context of gender equity is not different for people with a traditional, transitional or egalitarian gender ideology. No distinction needs to be made between those groups. In line with this finding, it needs to be concluded that gender ideology is not a good addition to McDonald's theoretical framework. In future studies other adjustments and additions can be made. A possibility is to include the role conflict people might experience more to the front of the theory. For example, by including whether the woman worked during childrearing years in the model. Now this is a silent assumption, included in the 'higher

gender equity in the society'. Part of higher gender equity is that women have the possibility to hold jobs. However, it would be interesting to include this factor at the micro level as well.

Chapter 9: Discussion

The most interesting finding of this master's thesis was that the *positive interaction effect* of 'division of domestic labour' and 'GEM' on the 'total number of children'. A possible explanation for this positive effect can be the causality issues mentioned in chapter 6: the 'division of domestic labour' and 'GEM' were measured at a later point in time than the time people made decision around having children. It can very well be that people who had more children in a context of gender equity, ended up with a more unequal division of domestic labour, (instead of the other way around) and that this accounts for the results. It is very hard to draw any major conclusions from the results presented in this thesis, especially because these causality issues exist. For this reason, more in-depth study of McDonald's theoretical framework seems appropriate before any conclusions are drawn about the validity of this theoretical framework.

Causality issues are common in fertility research. This is caused by the fact that you can only state for sure how many children women had after the menopause. Common ways to get around this problem are using fertility intention rather than realised fertility or studying the transition towards a second child. Both of these approaches have their own drawbacks. First, people often do not realise their fertility intentions and, second, studying the transition towards the second child leaves a lot of fertility transitions (no children to a child, second child to third child etc.) out of the picture. Ideally, a panel study is used in which respondents are followed for a long period of time. Although these studies are running now, data of longer time series for a comparative sample of countries are not released yet.

Using a sample of women over 40 was necessary for the reason that after this age women do not get many more children. However, it would be interesting to expand this study to younger generations, as their story might be different from the story of the generations included in this study. For example, it can be the case that the theoretical framework is especially true for the younger generations. Therefore, it would be good to expand the empirical test of the theory of McDonald to these younger cohorts.

Along this line of reasoning: it would be interesting to study this theory in a sample in which more European, and especially Scandinavian countries, are included, as they are the number one example of countries with a high societal gender equity. It could

be that the theory captures the European or maybe 'Western' picture, rather than an overall picture, which would become clearer in such a study.

One last remark has to be made about the selection of respondents for this study. Because the division of domestic labour between spouses was one of the main explanatory variables, respondents who were widowed or divorced at the time of interview were excluded from the analysis. In this dataset 2732 out of 8057 were divorced, widowed or separated at the moment of interview. In the case that one of the reasons for having a divorce would be an unequal division of domestic labour, this selection criterion could have seriously biased the results.

Epilogue

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I presented this master's thesis at various occasions. First of all at the end of my stay at the CPC in Southampton. Next, I presented the results of my thesis for the research group 'Inequalities and the Life Course', based at the discipline sociology, at the University of Groningen. Finally, I presented my thesis in a poster presentation at Popfest 2009 in London, where I received the first award for the best poster presentation. The poster is included in *appendix 4*. I want to thank everybody for their useful comments and suggestions at these various occacions. The comments really helped me to improve my study and think about improvements and shortcomings.

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