

Master Thesis, Utrecht School of Economics

Attitudes: The Little Things That Make Big Differences

**The Impact of Attitudes on the Education and Labour Decisions
of Women in the Netherlands**

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Abstract

Women's participation in the labour market has increased dramatically over the past decades, however it still lacks behind that of men. This study aims to investigate the relationship between the level of education, labour market behaviour and women's attitudes towards traditional gender roles. The paper examines whether these gender role attitudes have an important influence on the decisions related to pursuing higher levels of education. Additionally, we employ structural equation path analysis model in order to explore the relationship between gender role attitudes, the level of education and the weekly hours of work and to estimate the direct and indirect effects of the gender role attitudes and the level of education on the labour participation decision of women in the Netherlands. The results are dramatic. It is found that traditional attitudes substantially reduce the investment in education and that attitudes have crucial effect on the hours of work women spend within a week. We conclude that gender role attitudes have a significant and large impact on the decision of women in the Netherlands to invest in their education on the one hand, and on the decision to participate in the labour market on the other.

Key words: gender roles attitudes, education investment, Dutch labour market participation, panel data, ordered probit, mediation model, path analysis

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I. Introduction

One of the central issues in the literature examining the laws of the labour economy concerns with the decision to participate in the labour market. The answer is growing more complex by the fact that women's decision to supply labour differs greatly from that of men (Heckman 1978; Smith 1980). While some scholars believe that the gap in the labour market participation between women and men can be explained by demand-driven factors (Lazear 1989), others argue that a significant role should be attributed to the cultural attitudes that influence the formation and perception of the traditional gender roles (Mincer and Polachek 1974; Polachek 1981).

Due to the traditional role that imposes a greater commitment of women in matters related to home and family, it is assumed that most women expect in advance a shorter period of full employment, or employment subject to often terminations. Therefore, withdrawal from the labour market is a common occurrence among working women, which can be both temporary and permanent (Chuang and Lee 2003).

Economic theory predicts that this absence of women workers has a negative impact on the labour market outcomes and mainly through the following two mechanisms. The first concerns the investment in human capital by women. Namely, since women workers anticipate interruptions in their careers due to traditionally higher home-job commitment, and men expect long-term uninterrupted employment in the labour market, consequently their investments in education and skills (human capital) differ. In this sense, we must however emphasize that recent studies show that women successfully adjust their investment in education to the expectations they hold for their future employment, which is confirmed by the findings that the average level of human capital, measured by the years spent in formal education, differs very little between women and men (Vella 1994). Consequently, the difference in the output and overall performance on the labour market between them should not be sought in the differences in the level of human capital per se, but the researchers' attention should be directed towards the nature and form of the investment. In particular, women have an incentive to invest in that kind of human capital which will provide them with relatively flatter earning profiles and reasonably quick returns in the future. The second mechanism refers to the depreciation of human capital of working women after the termination of their employment. Mincer and Polachek (1974) claim that the average depreciation rate is 1.5% per year, and Sandell and Shapiro (1978) find an average annual depreciation rate of human capital of 0.5%. However, some studies also suggest depreciation rates of human capital of women in the labour market

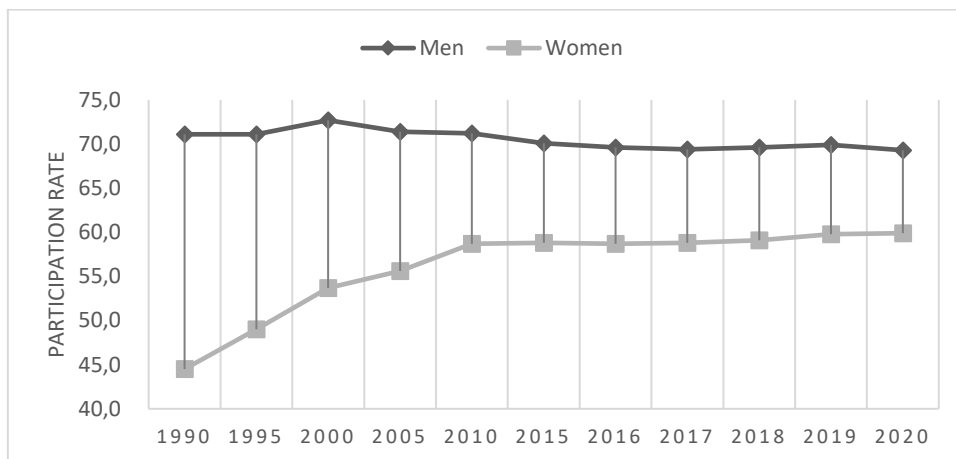
of up to 26.5% per year (Kim and Polachek, 1994). Such findings underscore the seriousness of this problem and the difficulties that women face when trying to return in the labour market.

Despite the fact that in the last decades the issue of gender inequality in the labour market is becoming increasingly attractive for economists, relatively few studies have been conducted on the impact of gender role attitudes on the accumulation and formation of human capital and labour supply of women. The significance of this problem can also be understood through the following example: parents who feel that a woman's role is in the home and not in the labour market, are more likely to invest less in their daughters' education, which will directly affect not only their future employment opportunities and level of earnings, but also their life decisions for starting a family. The relationship between the education level and labour market performance is well documented, but there are studies that find a strong link between the level of education and the fertility decisions as well (Fernandez and Fogli, 2009).

Moreover, women's decision to participate in the labour market is not only influenced by the parents, but also depends on the views of their partners. This relationship is documented in a study which finds that women whose partner grew up in family where women played an active role in the labour market had significantly higher labour market participation (Fernandez et al. 2004). In conclusion, a significant part of the variations observed over time in the supply of labour by women can be explained through variations in the gender role attitudes (Fortin, 2009).

In this context, there are several reasons why the Netherlands is an interesting case that needs to be examined. First, although the labour force participation rate for women in the Netherlands is on a rise and has significantly increased in the period from 1990 (44.5%) to today (59.9%), it is still notably lower than that for men (69.3 %). The labour force participation rate is calculated as the labour force divided by the total working-age population. The working age population, according to the OECD, refers to people aged 15 to 64. The development of the employment rate of women and men over the last thirty years can be seen in Chart 1. We note that although the female labour market participation rate in the Netherlands has been increasing steadily in the last decades, the gender gap in the labour market participation rate is still very pronounced. In contrast, the labour market participation rate for men in the Netherlands has been constant and is moving around 70%.

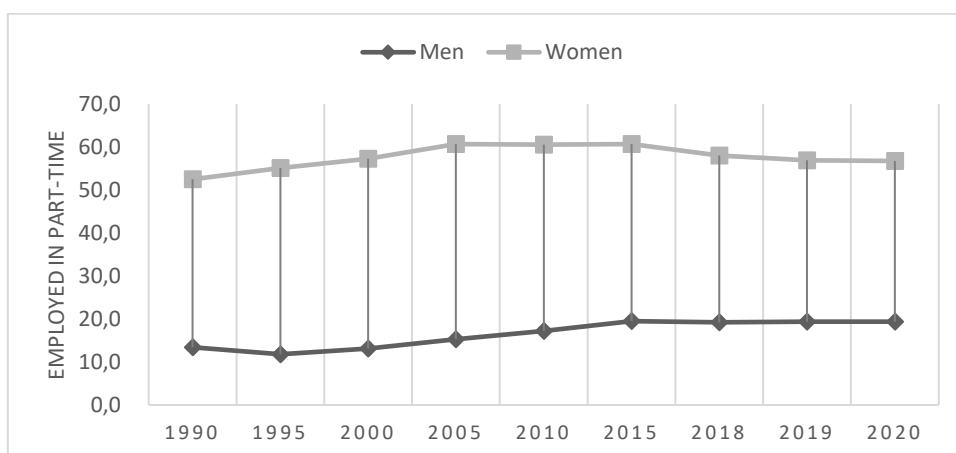
Figure 1: Labour market participation rate of women and men in the Netherlands



Source: OECD Gender Data Portal (<https://www.oecd.org/gender/data/>)

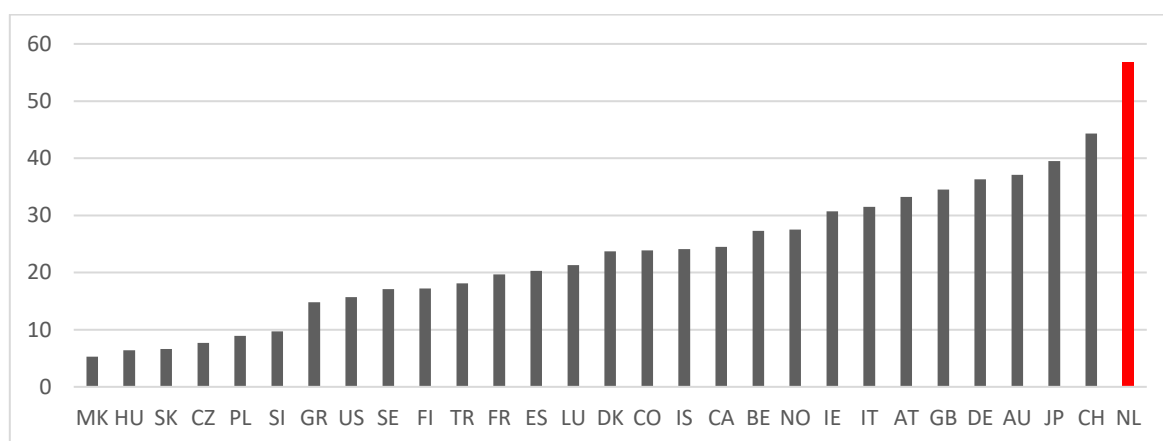
This increase in the participation rate can be largely attributed to the increase in the share of women in part-time employment. Almost 60% of the employed women in the Netherlands are employed for less than 30 hours per week, which places the Netherlands on the top of the list of countries with the largest number of women working part-time (Charts 2 and 3). Part-time work also affects the long-term development of their careers, as well as the overall performance of women in the labour market. As young women are often better educated than young men, they usually earn more than men of the same age when they work full time. However, the gender pay-gap becomes more pronounced in favor of men after women decide to have children.

Figure 2: Share of women and men workers employed in part time jobs in the Netherlands



Source: OECD Gender Data Portal (<https://www.oecd.org/gender/data/>)

Figure 3: Part-time employment of women in the OECD countries



Source: OECD Gender Data Portal (<https://www.oecd.org/gender/data/>)

The second reason why the Netherlands serves as the perfect example is the fact that the comparative survey data of the European Values Study (Halman et al. 2011) shows that Dutch women have the weakest work ethic compared to women in other European countries. The third reason refers to the latest indicators that suggest that women are more exposed to financial risk and risk of poverty in old age. Women in the Netherlands are almost three times more likely than men to face a 20% reduction in income in the event of a divorce. In addition, women's pensions in the Netherlands are on average 40% lower than men's, a gap that is one of the highest in the OECD countries. The latter can be explained by the shorter and more intermittent careers of female workers (Netherlands Policy Brief, OECD, 2018).

The contribution of this research are manifold. Many previous studies that try to shed light on the relationship between gender role attitudes and labour market behavior face data limitations, and consequently, they are most often based on cross-sectional analysis. With the development and improvement of the database gathered and run by the key statistical institutions across different countries and the emergence of more complex longitudinal data, it has become possible to examine this phenomenon through its temporal movement. For the purposes of this research, the Dutch LISS Panel Data which covers labour market indicators of the individual respondents will be used. The data and analytical methods employed in this study will be explained in more detail later. Previous studies have focused on a set of limited outcomes, such as labour market entries and exits. This research will expand the spectrum of dependent variables. The main dependent outcomes in this research can be divided in two parts: 1) investment in education and human capital and, 2) labour market performance. In relation to previous studies on the impact of gender role attitudes on women in the labour market in the

Netherlands, Stam et al. (2014) conducted research for the period 2007 to 2010, focusing on the relationship between work ethic and women's labour supply, controlling for gender role attitudes. This research complements that study in two ways. First, the main emphasis is on the impact of gender role attitudes on women's education attainment and then on their decisions for participating in the Dutch labour market. Second, we use longer time series of data that includes more recent years (2011 to 2021), thus the impact of these gender role attitudes on the decisions of women in the Netherlands to invest in their education and participate in the labour market is analysed from today's perspective.

In this study there is one issue that must be taken seriously into account. Namely, we have to be extremely careful when interpreting the direction of causality. Although it is clear that the perception of gender role attitudes affects the level of investment in education and the level of human capital, it is possible that the level of education influences the gender role attitudes. Consequently, it is crucial to keep this threat in mind in any empirical research on this topic and to accordingly test the direction of causality. In our analysis, we place an emphasis on examining whether gender role attitudes are weakly exogenous in respect to the level of education. The results of this test are presented in more detail in Section IV of this paper. We are also implementing another method to help us reduce the risk of spurious regression estimates. That is, we are implementing lagged values of the gender role attitudes.

With this in mind, we can now define the research questions which we will try to answer. This paper investigates the link between women's labour market behaviour and their attitudes towards traditional gender roles. Initially, however, it focuses on the investments in education before examining women's labour supply decisions. We expect gender roles attitudes to play a key role in the decision-making process regarding the investment in education and participation in the Dutch labour market.

The structure of this study is organised as follows. In the next section we provide an overview of the theory, the literature and the main findings. Next, in Section III we explain the data and we motivate the methodology design. Section IV examines the link between gender roles attitudes and female's investment in education. In Section V we shed light on the relationship between gender roles attitudes, education level and labour market participation using a mediation model. In Section VI we discuss and compare our findings to the previously conducted research that examines this topic. In Section VII we discuss the limitations of this study after which concluding remarks and policy recommendations are provided.

II. Theoretical background

In the Netherlands, many women work part-time. Because of this, many of them earn insufficiently to be financially independent. Finding a way to make women economically independent and to encourage and motivate them to make full use of their potential is crucial for the overall productivity of the national economy and should be one of the priority issues related to the Dutch labour market. Research shows that the gender gap, although reduced, is still persistent. Significant differences occur in labour market participation, the share of women with part-time employment, but additionally, unequal is the distribution of paid work and unpaid home work between couples (Van der Lippe et al., 2011; Steiber and Haas, 2010). Some authors consider gender role attitudes to be one possible explanation for this gap (Schober and Scott, 2012; Stam et al. 2014; Lietzmann and Frodermann, 2021).

Several definitions of gender role attitudes can be found in the literature. Here we will start with the more general ones, which define gender ideology as individuals' level of support for the division of paid work and family responsibilities, based on beliefs in relation to gendered separate spheres (Davis and Greenstein, 2009 , p. 87). The authors make a distinction between traditional and egalitarian profile of a person. Individuals who support and practice traditional gender ideology believe that the role of the woman is primarily to care for the household and children, while the role of man is to provide income for the family. Such attitudes are accompanied by the belief that men are better suited for paid work outside the home. On the other hand, individuals who represent the views of the egalitarian gender ideology believe that men and women have equal responsibility, but also equal ability to work in the household and to take care of the children. Similarly, such attitudes are reflected in relation to the equal ability of women and men to work outside the home, i.e. paid work. This unidimensional view of gender ideology is criticized and assessed as problematic, which is why an alternative framework is recommended, one that takes into account the multidimensionality of the concept of gender ideology. Thus, instead of two ideologies, proponents of the multidimensional gender ideology are talking about a spectrum of ideologies, a concept that includes different profiles such as: egalitarian, egalitarian essentialism, intensive parenting, moderate traditional, and traditional (Grunow, Begall and Buchler, 2018). In this research, we define gender ideology in the context of gender role attitudes that relate to women's decision to invest in their own formal education, and influence their behaviour in the labour market. Gender role attitudes, on the other hand, are beliefs and concepts that relate to the social role that is best suited to women and men. These attitudes can refer to various dimensions of social life, such

as men's priority in earning family income, beliefs about the role of women in the home and child care, attitudes about working women and relationship quality, acceptance of male privilege, views related to the necessity of formal education of daughters and so on (Lietzmann and Frodermann, 2021). These definitions are in line with similar previous studies (Vella, 1994; Khoudja and Fleischmann, 2018).

To better understand gender role attitudes, we can analyse their formation and what factors influence their evolution over the years. Cunningham (2001) argues that gender role attitudes are formed during the socialization in childhood, and concludes that parental modeling and maternal gender role beliefs are important for the formation of young adults' gender roles attitudes. On the other hand, these gender role attitudes are subject to change under the influence of work experience and motherhood in the adult life period (Berrington et al., 2008). A more general study of the cultural transmission of attitudes related to women's gender roles reveals that the supply of labour by women is highly susceptible to the heterogeneous structure of such attitudes. Evidence reveal that parents' level of education, attitudes and behavior, religiosity, and employment status are associated with the formation of gender role attitudes (Farre and Vella, 2013).

Over the last decades, several factors that contribute to the change of gender role attitudes have been observed. First, literature talks about the development of individualism as the dominant norm, which encourages the behavior of young people, and perhaps girls in particular, to follow their passion and to study and work in fields that will allow them to realize their true selves (Charles, 2011). Second, in developed countries, such as the Netherlands, in recent years there have been rapid changes in legislation and labour market policies, which facilitate the choice of women between paid and domestic work by increasing child-care supply and easy access to part-time employment (Hakim, 2000).

When studying the relationship between gender roles and female labour market activity, one of the key starting points is the identification of the direction of interdependence, i.e causality, between the two phenomena. There are two theories in the literature that try to shed light on this issue - cognitive dissonance theory and the theory of planned behavior. These two theories have opposing views. In his book, Festinger (1957) argues that according to the cognitive dissonance theory, individuals orient themselves to taking actions that reduce dissonance. This context of behavior is considered through individual examples of decision making, but also as mass phenomena. In other words, according to the theory of cognitive

dissonance, individuals adjust their attitudes in response to life events. This theory is supported by studies that find that gender role attitudes may be adjusted to accommodate situational constraints. Women in employment increase their own support for egalitarian gender role attitudes and develop stronger work commitment over time (Corrigan and Konrad, 2007).

In contrast, the theory of planned behavior explains that intentions precede behavior and activities of the individuals. Intentions to perform behaviors of different kinds can be predicted with great precision according to the existing attitudes and subjective norms towards the behavior. These intentions, together with the perception of controlling behavior, account for considerable variance in actual behavior (Ajzen, 1991). According to this theory, the gender ideology of women affects the inclusion of women in the labour market in the early stages of their careers, after which this decision may shape their labour market status in the future. The claims of this theory are subject to criticism, due to the fact that very often individuals have many conflicting interests and beliefs, which can lead to deviations from the initial views and beliefs about women's preferred investments in human capital and their actual investments, same as with their preferences for involvement in the labour market and their actual employment conditions (Janus, 2012)

Previous literature examining the relationship between attitudes related to gender roles and women's performance in the labour market have been largely based on cross-sectional data, comparing gender ideologies in comparative cross-national studies. These studies suggest that in modern societies the trend is in favour of the egalitarian model of gender roles (Grunow et al., 2018). Additionally, these studies are supported by studies based on time series data, where authors find changes over the past 40 years, namely that there has been an increase in the number of egalitarians who support equality in public and private spheres among women and men (Scarborough et al , 2018). Despite finding a strong cross-sectional relationship between attitudes and labour market behaviour, studies based on longitudinal data are more suitable for studying these issues, because in that way the concept and direction of causality can be better understood (Fortin, 2005).

Longitudinal studies conducted for the US (Corrigan and Konrad, 2007; Cunningham, 2008) and UK (Berrington et al., 2008; Schober and Scott, 2012) labour market find a positive effects of women's egalitarian gender role attitudes on education and employment. In the US context, findings show that women' traditional attitudes towards gender roles result in substantial reductions in their human capital investment, labour supply and rates of return to

education (Vella, 1994). Similar impact can be found in the behaviour of women in the labour market in Germany, where egalitarian attitudes among women reduce the differences in full-time employment. Moreover, the authors find that single men and women do not differ significantly in their employment probabilities, but women in couple households are less active in the labour market than their male counterparts (Lietzmann and Frodermann, 2021).

Studies focusing on the Dutch labour market find interesting results. Stam et al. (2014) argue that work ethic is positively associated with women's labour market participation, controlling for women's gender role attitudes. The authors conclude that the role of values in women's employment decisions is very important and might even become increasingly important, which means that policy makers who aim at stimulating women's labour market participation are advised not to neglect women's values. Khoudja and Fleischmann (2018) find that a male partner with traditional gender role attitudes increases women's risk to exit the labour market, but has no effect on women's labour market entries or changes in the number of hours worked. Furthermore, the authors do not find evidence for a direct association between women's gender ideology and changes in their number of hours worked. According to them, the lack of significant association between traditional gender ideology and changes in hours suggests that once women in partnerships settled on a certain extent of involvement in the labour market (full-time or part-time job), their own or their partners' gender ideology are not a strong driver for change in the quantity of their labour market involvement.

From the theoretical literature review we could see that both papers examining the case in the Netherlands (Stam et al., 2014; Khoudja and Fleischmann, 2018) emphasize the behavior and participation of women in the labour market and their labour supply. In the first case, Stam et al. (2014) examine the impact of work ethic, and in the latter case, Khoudja and Fleischmann (2018) place emphasis on gender role attitudes, a factor that is in the focus of this paper as well. The first part of this scientific study will focus on an issue that is less explored in the field of economics and the existing literature. Hence, there is a notable gap in conducted research studies for many countries, including the Netherlands, regarding the relationship between gender role attitudes and women's investment in education and the acquisition of human capital. The second part of the paper will be devoted to the relationship between traditional or egalitarian attitudes regarding the gender roles and the performance of women in the Dutch labour market, after which the obtained results will be compared to the findings of previously conducted studies that examined this question.

III. Data and methodology

To address this paper's research questions empirically, we employ data from the Longitudinal Internet studies for the Social Sciences (LISS Panel Data), conducted by the CentERdata research institute (Tilburg University, The Netherlands), which was awarded this project back in 2006 by the Netherlands Organization for Scientific Research (NOW). The LISS data itself consists of 5000 households, comprising approximately 8000 individuals. The panel is based on true probability sample of households drawn from the population register by Statistics Netherlands (CBS), including persons without internet access. Panel members complete monthly questionnaires and one member of the household provides the household data and updates this information regularly. The LISS Core Study is completed on a yearly basis by the panel. This longitudinal study covers a large variety of domains, such as income, family and housing, religion, ethnicity, politics, values, work, health and education.

For the purpose of this research, three core modules of the LISS Data are employed: 1) Work and Schooling; 2) Politics and Values; 3) Religion and Ethnicity, for total of eleven waves for the years 2011 to 2021. The Background information of the respondents are added to these three modules in order to be used as control variables. A number of background variables and structural characteristics are held constant, because these are expected to be the most obvious sources for possible spurious relationships between the independent and dependent variables. In the models we employ controls for age and marital status of the respondents. Furthermore, a control variable is included which indicates whether the respondent has children living at home, or there are no children living at home. We control for the urban character of the place of residence of the respondents. Control variables are also added to account for the origin of the respondents. Finally, control variables for religion are added as many authors argue that religion has an important impact in shaping the cultural values and attitudes in life (Vella, 1994; Lietzmann and Frodermann, 2021).

Control variables

In conducting the econometric analysis, we included several control variables, which we expect to be an important source of variation and risk for spurious regression. The inclusion of these specific control variables is comparable to similar research on the effects of gender role attitudes on the labour market performances (Vella, 1994; Stam et al., 2014; Khoudja and Fleischmann, 2018; Lietzmann and Frodermann, 2021). We started the cleansing of the initial data by keeping the observations that refer only to the female respondents because of our interest in the influence of gender role attitudes on the decisions women make regarding their

education and labour market participation. We control for the age of the respondents and include only female respondents in the Netherlands aged 25 to 70, since we are interested in the individuals of the working population who have made their human capital investment decisions. It is reasonable to expect that most of the respondents aged 25 or more have made up their mind whether they wish to pursue higher levels of education. To control for the marital status of the respondent, we have included binary variable that takes the value of 1 if the respondent is wedded and 0 if the respondent is unwedded. Additionally, we control for the number of living-at-home children in the household. In order to do so, we employ categorical variable that in the LISS Data takes nine values, 0 to 8, to indicate whether there are no children in the household or there are up to eight children. In our analysis, we include only the first four values of this variable, i.e. we consider the respondents who do not have children, or have up to three children. We think this is quite enough to account for the potential effect children upbringing has on women's labour market behaviour.

The degree of urbanization of the place of residence is another control variable in the models. We employ five degrees of urbanization as defined in the LISS Data. The place of residence of the respondent in this context can be either extremely urban, very urban, moderately urban, slightly urban or not urban. The last demographic control variable is the origin of the individual. We make distinction between individuals with 1) Dutch background; 2) First generation immigrants with western background; 3) First generation immigrants with non-western background; 4) Second generation immigrants with western background and; 5) Second generation immigrants with non-western background. In the LISS Data, an immigrant is defined as a person who is not born in the Netherlands, or who have a parent who is not born in the Netherlands. This definition is in line with the definition of the Statistics Netherlands (CBS). Controlling for the origin of the individuals we will be able to account for potential differences between individuals regarding their traditional gender role attitudes, their level of education and labour market participation, caused by factors related to their region of origin.

Finally, we control for the religious views of the individuals. LISS Data makes distinction between the following religious groups: Roman Catholic Church, Protestant Church in the Netherlands, Eastern Orthodox Christian Church, Evangelical and Pentecostal churches, Dutch Reformed Church, Reformed Churches in the Netherlands, other Christian church, Hinduism, Buddhism, Judaism, Islam, Humanism, other non-Christian religion. The Roman Catholic Church serves as our control.

Gender role attitudes, level of education and hours of work

In the first part of this study (Section IV), the level of formal education for which the respondents have obtained a diploma appears as a dependent variable. This is a categorical variable with six modalities that come in the following order: 1) Primary school; 2) Intermediate secondary education; 3) Higher secondary education; 4) Intermediate vocational education; 5) Higher vocational education and; 6) University education.

In the second part of the study (Section V), a dependent variable of main interest is the participation of women in the Dutch labour market, as proxied by the hours spent at work per week. As can be seen from the descriptive statistics in Table 1, the mean value of hours of work per week is 26,05. For the independent variable – gender roles attitudes, we have created a continuous index variable based on the agreement with five statements related to the traditional gender roles which are part of the LISS questionnaires. Several methods can be commonly found in the literature for creating an index such as ours which represents these gender role attitudes. The possibilities range from creating binary variables for each of the gender role statements, to assigning values to each answer after which we aggregate all the values to obtain one final value indicating whether the respondent has traditional or modern gender role attitudes. The gender roles statements used in our case, such as the creation of the attitudes index are explained in Section IV in more detail.

After cleaning the data, we have ended up with a sample of approximately 23.000 to 24.000 observations. However, the sample size of the various models differs depending on how many respondents answered the different study questionnaires, but are in the margin of approximately 11,000 observations.

Table 1: Descriptive statistics of the variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Age	23361	49,513	12,476	25	70
Children	23361	0,777	1,007	0	3
Partner	23361	0,717	0,450	0	1
Urban	23186	2,299	1,328	1	5
Origin	22629	22,292	56,236	0	5
Religion	6887	2,509	2,385	1	14
Attitudes Index	18724	11,062	3,968	5	25
Education	23361	3,852	1,386	1	6
Hours of work	16581	26,050	13,032	0	100

Source: Longitudinal Internet studies for the Social Sciences (LISS) data; 2011 – 2021 waves

Analytical approach

The analytical strategy for answering our research questions is as follows: First, we bear in mind that previous literature has shown that the relationship between gender roles attitudes and education and employment decisions can be subject to endogeneity and reverse causality (Fortin, 2005; Lietzmann and Frodermann, 2021). Therefore, we perform a test of weak exogeneity of the gender roles attitudes index with respect to the level of education. If we fail to reject the hypothesis that attitudes are weakly exogenous to educational investment, we will be able to infer that individuals are most likely determining their views towards gender roles attitudes *outside* the education system. In addition, as Corrigall and Konrad (2007) suggest, attitudes and behaviour should be measured at different points in time to understand the long-term effects of attitudes on behaviour. For these reasons, a longitudinal sample is used that includes respondents for whom there are measurements of gender role attitudes, level of education and labour market participation at different points in time.

We employ Ordered Probit model to answer the question about the relationship between gender role attitudes and the level of education, since our education variable is ordered categorical variable. Later, the marginal effects of the attitudes index on each of the six educational levels will be discussed. Furthermore, to answer the question in what way and to what extent gender role attitudes and the level of education influence women's decisions for participation in the labour market in the Netherlands, we employ a Mediation Structural Equation model (MEDSEM), where we differentiate the direct and the indirect effects of the level of education as an independent variable and attitudes index as a mediator on the weekly working hours as a dependent variable. Finally, clustered standard errors are estimated to adequately capture the nested data structure, since we have several waves per respondent.

IV. The relationship between gender role attitudes and investment in education

In analyzing the relationship between gender role attitudes and the investment in education, we can begin by making use of the theoretical postulates based on the model of Mincer (1958). In this framework, labour market performance is explained through single-equation models that explain wage income as a function of schooling and experience. Such models emphasize the importance of the expected duration of the period through which returns from education are received. With traditional gender role attitudes in mind, such models can have strong implications for women. If female workers are more likely to expect termination of

employment or exit from the labour market due to traditional unpaid work in the household and around their children, then there is less incentive for these women, relative to the incentive of men, to invest in human capital (Mincer and Polachek, 1974).

To begin with, we need to find a way to empirically answer the question of whether and to what extent gender role attitudes affect women's decisions to invest in their education. In doing so, as it was emphasized earlier, we need to be very careful about the causality between the level of education and the attitudes related to the traditional gender roles of women. With several adjustments to the needs of the Dutch LISS data used in this research, this first part of the analysis follows the econometric model of Vella (1994) where the demand for education and a reduced-form equation for gender role attitudes are represented through the following equations:

$$E_i = \alpha_0 + \alpha_1 ATT_i + \sum \alpha'_j X_{ji} + u_i, \quad i = 1, \dots, n, \quad (1)$$

$$ATT_i = \beta_0 + \sum \beta'_k Z_{ki} + v_i, \quad i = 1, \dots, n, \quad (2)$$

where E_i ¹ is a categorical variable that indicates the level of education of individual i ; ATT_i is an index that represents the traditional attitudes towards gender roles of individual i ; X and Z are vectors of exogenous control variables; α and β are slope coefficients that need to be estimated; and u and v are statistical errors that follow normal distribution with variance σ_u^2 and σ_v^2 respectively, and a covariance σ_{uv} .

A measure of the ATT index is created by analyzing the responses regarding the individual's view on gender role attitudes. From the Politics and Values module of the LISS Data, five statements concerning gender roles are considered for which the respondents are providing their level of agreement by choosing one of the following options: 1) fully disagree; 2) disagree; 3) neither agree nor disagree; 4) agree; and 5) fully agree. The statements from the LISS questionnaires that we have taken into account are the following²:

¹ Vella (1994) suggests that education years is an inappropriate measure of human capital because of two reasons. First, it implies that a year of education is the same irrespective of when it is obtained. Second, it ignores that at higher education levels the actual qualifications represent ordinal outcomes where one investment is higher than another although it is difficult to impose 'distance' between them. In order to overcome these two problems, it is possible for the researchers to employ observed censored variable that denotes the obtained level education (E). Essentially, with censoring the observed variable, we transform the initial dependent variable in a new dependent variable which has an ordered form, thus the parameters of the model can be estimated by ordered probit model (Tobit model).

² The final list of statements might be expanded and modified. The LISS Data offers several statements that can be included in the construction of the ATT index which indicates whether the respondent has traditional or egalitarian gender role attitudes. For instance, the following statements from the LISS questionnaire might be

Table 2: Statements relating to the construction of the Attitudes Index

i.	A working mother's relationship with her children can be just as close and warm as that of a non-working mother
ii.	A child that is not yet attending school is likely to suffer the consequences if her or his mother has a job
iii.	Overall, family life suffers the consequences if the mother has a full-time job
iv.	The father should earn money, while the mother takes care of the household and the family
v.	A woman is more suited to rearing young children than a man

Note: In constructing the index individuals were assigned a value of 1 if they fully disagree; 2 if they disagree; 3 if they neither agree nor disagree; 4 if they agree; and 5 if they fully agree. The values of the responses to statement (i) were reversed to ensure consistency in the ordering.

Source: Politics and Values module questionnaire of the LISS Data

In the literature, two methods are commonly used to create an index such as the ATT index. First, each answer can be transformed into a dummy variable through which traditional or egalitarian gender role attitudes are represented. However, in our case, several gender role statements may be highly correlated with each other. Therefore, the method we use here consists of assigning values ranging from 1 (fully disagree) to 5 (fully agree) for each of the five statements. The answers are then aggregated to create a new variable ranging from 5 to 25, where a score of 5 indicates an extremely modern (egalitarian) attitudes, while a score of 25 indicates an extremely traditional attitudes towards gender roles.

We acknowledge that such a procedure is far from ideal. First, it is fair to ask the question to what extent it is justified one to expect that the numerical valuation of the level of agreement with a given statement is appropriate. The five statements that we have singled out from the LISS Data can be interpreted in different ways, and at the same time the subjective perceptions of the respondents and their current mood play a huge role. Second, five responses are offered in the questionnaire to each individual: 1) fully agree; 2) agree; 3) neither agree or disagree; 4) disagree and 5) fully disagree. Thus, the offered responses might not have had the same meaning for each individual. Third, the procedure that we are using for the construction of the attitudes index predicts assignment of equal weight to each of the five statements. Finally, there is a real doubt about the accuracy of the given answers. The individual may not have known the true response or may have given the answer they thought was correct.

of interest of the future researchers as well: 1) It is less important for a girl than a boy to get a good education; 2) Generally speaking, boys can be reared more liberally than girls; and 3) It is unnatural for women in firms to have control over men.

The dependent variable has an ordered form and the parameters can be estimated by ordered probit. In estimating equation (1) we need to pay particular attention to the potential endogeneity of the gender role attitudes (ATT_i) with respect to the level of education. To test this, we formulate and test a hypothesis that attitudes are weakly exogenous to investments in education and human capital. If we fail to reject this hypothesis, it would mean that the attitudes towards the gender roles of individuals are formed outside the education system. To conduct the test, we can employ Smith and Blundell (1986)³ exogeneity test for a simultaneous equation. In essence, using equation (2) we produce estimates of v_i , denoted as \hat{v}_i , as $ATT_i - \beta_0 - \sum \beta' Z_i$, after which we estimate equation (1) by ordered probit model after including \hat{v}_i as an additional variable, with slope coefficient λ , as shown in equation (3). The t-test on the null hypothesis that λ is equal to zero is a test of weak exogeneity of ATT_i with respect to E_i .

$$E_i = \alpha_0 + \alpha_1 ATT_i + \sum \alpha'_j X_{ji} + \lambda \hat{v}_i + u_i, \quad i = 1, \dots, n, \quad (3)$$

We now focus on estimating the effect of the gender role attitudes on the individual's investment in education represented in equations (1) and (2). First, we estimate the reduced form equation where the Attitudes Index appears as a dependent variable. The regressors characterize the individual's environment in which their gender role attitudes were formed. According to the literature, these gender role attitudes are formed from the earliest childhood years under the influence of the immediate environment of the children, which includes the family and the ideologies with which children are in contact during their growth and development (Vella, 1994; Lietzmann and Frodermann, 2021). Because of this, many factors that describe the composition of the family and the role of the family members need to be considered. For example, the level of education of the parents, their employment status, the number of siblings of the respondents, the degree of urbanity of the environment in which the respondents live, living with a partner, ethnicity and other cultural factors, as well as the religious ideology of the respondents and their parents. In our study, we include variables that have a predicting power of gender role attitudes and that are available in the LISS Data. Column 1 in Table 3 presents the results from regressing the attitudes index (ATT_i) against these variables. Several regressors have statistically significant impact on the individual's gender role attitudes. These variables can be divided in two main categories – demographic and religious variables. Let us consider them systematically.

³ Smith, R. J., and Blundell, R. W., An exogeneity test for a simultaneous equation Tobit model with an application to labour supply, 1986

Table 3: Model estimates

	OLS regression Attitudes Index	Ordered Probit with residuals Level of education	Ordered Probit with lags Level of education
Gender role attitudes	– –	-0.09** (0.04)	– –
Lagged Attitudes	– –	– –	-0.08*** (0.01)
Age	0.03*** (0.01)	-0.03*** (0.00)	-0.03*** (0.00)
One child	0.37 (0.31)	0.10 (0.08)	0.03 (0.06)
Two children	0.19 (0.29)	0.14* (0.08)	0.07 (0.06)
Three children	0.88** (0.40)	0.14 (0.11)	0.07 (0.08)
Partner	0.15 (0.26)	-0.12 (0.08)	-0.14*** (0.05)
Very urban	0.47 (0.37)	-0.10 (0.12)	-0.23*** (0.07)
Moderately urban	0.76** (0.38)	-0.15 (0.13)	-0.30*** (0.08)
Slightly urban	0.77** (0.38)	-0.31** (0.13)	-0.29*** (0.08)
Not urban	0.74* (0.40)	-0.16 (0.13)	-0.23*** (0.08)
First gen. western	0.77 (0.49)	0.47** (0.21)	0.44*** (0.15)
First gen. non-western	0.70 (0.51)	-0.13 (0.17)	0.06 (0.15)
Second gen. western	-0.35 (0.67)	0.12 (0.17)	0.01 (0.10)
Second gen. non-western	0.92 (0.95)	0.10 (0.33)	0.10 (0.17)

Protestant	-0.16 (0.25)	— —	— —
Eastern Orthodox	0.89 (0.74)	— —	— —
Evangelical	1.61 ^{***} (0.42)	— —	— —
Dutch Reformed	1.70 ^{***} (0.34)	— —	— —
Reformed Churches	2.13 ^{***} (0.47)	— —	— —
Other Christian	1.61 ^{***} (0.48)	— —	— —
Hinduism	0.65 (0.86)	— —	— —
Buddhism	1.04 (0.81)	— —	— —
Judaism	-0.15 (0.88)	— —	— —
Islam	3.53 ^{***} (0.74)	— —	— —
Humanism	-0.20 (2.89)	— —	— —
Other non-Christian	1.50 (1.43)	— —	— —
Residuals (λ)	— —	0.02 (0.04)	— —
Constant	8.99 ^{***} (0.66)	— —	— —
Observations	5686	5686	11151

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Authors' calculations; Data from the Longitudinal Internet studies for the Social Sciences

The variable indicating the age of the individual has a positive and statistically significant coefficient, suggesting that older women in the Netherlands have more traditional attitudes towards gender roles. While it is difficult to point out the main reason for this phenomenon, it

can be concluded that with the continuous progress of societies, attitudes towards gender roles are changing and becoming more egalitarian. We can see that women with three children living in the household have on average more traditional attitudes. We do not find statistically significant difference in gender role attitudes between women who do not have children or those who have one or two children. No statistically significant effect can be observed for the variable indicating whether the individual lives together with a partner. However, we find that the urban nature of the individual's household may influence her attitudes towards gender roles.

A surprising result from Column 1 of Table 3 is the statistically insignificant impact of the origin of the individual. We find no evidence that immigrants have more traditional attitudes towards gender roles compared to the Dutch people. This holds for both first and second generation of immigrants of western and non-western origin.

It is very likely that religious beliefs are an important determinant of the gender related attitudes. To see this, we include dummy variables into the model as regressors that differentiate several religious groups, with Roman Catholicism employed as the control group. Some Christian groups have more traditional views on gender roles compared to members of Roman Catholicism. These include the Evangelical Church, the Reformed Churches and other Christian communities. However, those in the Islamic religious group have dramatically more traditional views than the Roman Catholics. This result was also found by Vella (1994).

We can now compute \hat{v} as the least squares residuals and estimate equation (1) for the effect of the attitudes on the level of obtained education by ordered probit while including the residuals as an additional variable. The results are reported in Column 2, Table 3. The most important coefficients are those of the attitudes and the residuals. The negative sign before the gender role attitudes index indicated that more traditional views reduce the investments in education. Equally important is that the coefficient before the residuals is statistically insignificant. Therefore, we fail to reject the hypothesis of weak exogeneity of attitudes with respect to educational attainment. This suggests that the attitudes towards gender roles are formed outside of the education system. This might come as a surprise but as we have seen from Column 1 the determinants that explain the variation in attitudes are variables linked to the upbringing of the children and their home environment. Accordingly, significant part of the attitudes is determined independently of the education system. We can now re-estimate the ordered probit equation without the residuals. In addition, we consider the suggestions of Corioll and Konrad (2007) and Lietzmann and Frodermann (2021) and employ lagged gender

role attitudes of second order⁴, so that the attitudes and the behaviour of the respondents are measured at different points in time. These results are reported in Column 3, Table 3.

The main feature is the strong negative impact of the traditional gender role attitudes on educational attainment, meaning that women in the Netherlands with more traditional views are less likely to pursue higher levels of education. The remaining variables display the expected signs. Given the fact that the regressor of main interest in our analysis is the Attitudes Index and its role in the decision process of women whether and to what extent to invest in their education, we proceed with an analysis of the marginal effects the gender role attitudes have upon each category of education. To put it differently, we can estimate the probability of an individual having acquired a given level of education if their views on gender roles become more traditional by one unit. The results are shown in Table 4.

Table 4: Marginal effects of the gender role attitudes on educational attainment

Level of education	dy/dx	Std. error	z	p> z	[95% Confidence Interval]	
Primary school	0,003	0,000	6,940	0,000	0,002	0,004
Intermediate secondary education	0,022	0,002	13,890	0,000	0,019	0,025
Higher secondary education	0,004	0,000	9,590	0,000	0,004	0,005
Intermediate vocational education	0,000	0,001	-0,580	0,562	-0,002	0,001
Higher vocational education	-0,019	0,001	-12,970	0,000	-0,022	-0,016
University education	-0,010	0,001	-12,320	0,000	-0,012	-0,009

Source: Authors' calculations; Data from the Longitudinal Internet studies for the Social Sciences

From the table above, we can clearly notice the direction of the impact of gender role attitudes on the decision of women to invest in their education. Essentially what these results show us is how a one unit increase in the Attitudes Index affects the likelihood that the surveyed individual belongs to one of the six ordered education categories. Let us first consider the lower levels of education and how the likelihood of belonging to them changes for the respondents. If the gender role attitudes index increases by one unit, we observe that the respondent is 0.3% more likely to be part of the primary school level of education. The change in the probability of the respondent to be part of the second and third level of education is positive as well. Namely, if a woman's level of traditional views regarding the gender role attitudes increase by one unit, she is 2.2% more likely to have obtained intermediate secondary education, and 0.4% more likely to have obtained higher secondary education. However, when it comes to higher

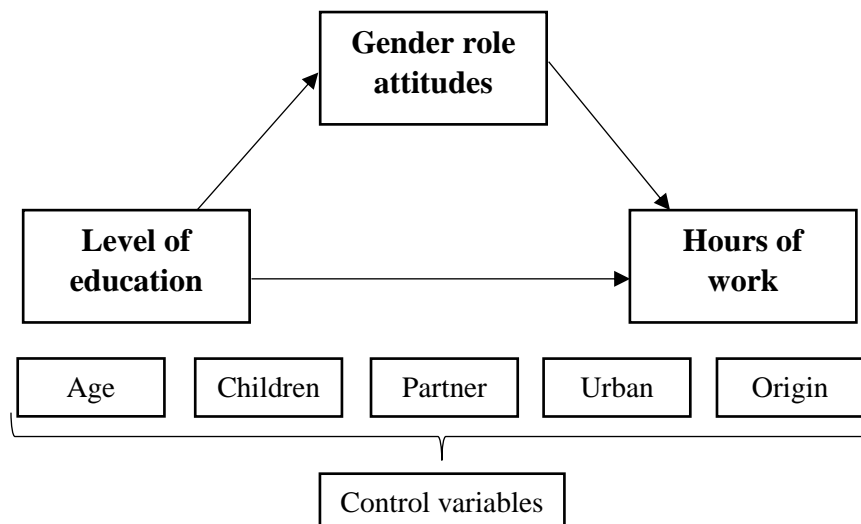
⁴ We use two periods lag on the "gender role attitudes" index because using lags of 3rd or 4th order will lead to losing many observations

levels of education, we notice that the coefficients, or the probabilities, become negative. This means that women in the Netherlands with more traditional views on gender role are less likely to obtain high level of education. More specifically, if the gender role attitudes index increases by one unit, the respondent is 1.9% less likely to be part of the higher vocational education level. In addition, if the gender role attitudes index increases by one unit, the respondent is 1% less likely to have acquired university education. Hence, we can derive the conclusion that if the Attitudes Index is high, i.e. if the respondents have more traditional views on gender roles, the predicted probability of them having attended high level of education decreases.

V. The relationship between gender role attitudes and labour market participation

In this part of the paper, by analyzing the same sample and the previously described variables, we will try to give an answer to a question related to the participation of women in the Dutch labour market, as proxied by the hours of work per week. Our objective is to understand the process by which the education level (independent variable) affects the weekly hours of work (dependent variable), perhaps in part directly and in part indirectly, occurring through the activation of a mediator – gender role attitudes. We explore these effects through causal mediation analysis, which helps us to quantify the importance of the mediator. More specifically, we apply structural equation modelling, as suggested by Gunzler et al. (2013). These SEM models include both endogenous and exogenous variables and model the causal relationships between them. The mediation models are best represented by path diagrams:

Figure 4: Mediation model for the relationship between the level of education, gender role attitudes and hours of work



Let us denote the three variables in our mediation model by corresponding symbols. Let the dependent variable be denoted by Y , the independent variable be denoted by X , and let our mediator be denoted by M . Additionally, let the control variables in the model be denoted by C . The structural equation mediation model for the i_{th} subject can therefore be given by the following set of equations:

$$Y_i = \gamma_0 + \gamma_{xy}X + \gamma_{cy}C + \varepsilon_{yi} \quad i = 1, \dots, n, \quad (4)$$

$$Y_i = \delta_0 + \delta_{xy}X + \delta_{my}M + \delta_{cy}C + \varepsilon_{yi} \quad i = 1, \dots, n, \quad (5)$$

$$M_i = \theta_0 + \theta_{xm}X + \theta_{cm}C + \varepsilon_m \quad i = 1, \dots, n, \quad (6)$$

The model represented by the equation (4) regressed the hours of work as dependent variable on the level of education as an independent variable, including the control variables. The model represented by equation (5) further included the gender role attitudes. The third model represented by equation (6) was constructed for gender role attitudes as the dependent variable.

The mediation model of this type allows us to estimate the direct effects, indirect effects, and the total effects. At the same time, by estimating equations (4), (5) and (6) we will perceive and quantify the influence and role of gender role attitudes as a mediator. The direct effect is the pathway from the independent variable (level of education) to the outcome variable (hours of work per week), while controlling for the several background variables, including the gender role attitudes taking the function of a mediator. The direct effect, in our path diagram shown in figure 4, is estimated by the coefficient δ_{xy} , or the arrow that connects the level of education with the weekly hours of work. The indirect effect describes the pathway from the independent variable to the outcome variable *through* the mediator. Mathematically, this path in the model is represented by the product of θ_{xm} and δ_{my} . Finally, the total effect is the sum of the direct and the indirect effects of the independent variable on the outcome, $\delta_{xy} + \theta_{xm}\delta_{my}$.

It is important to note that the variable that we use which indicates the level of education of the respondent is not continuous. In fact, it is a categorical variable. Moreover, some of the control variables are categorical as well. As the structural equation models assume normal distribution of its variables, and the categorical variables do not follow normal distribution, we have constructed binary variables for each modality of categorical variables. Binary variables can be included in the SEM models in Stata. The output of the mediation structural equation modelling process is shown in Table 5 and 6.

Table 5: Regression models estimated; Hours of work per week as the dependent variable

	Model 1: Not including attitudes as predictor				Model 2: Including attitudes as predictor			
	Estimate	Lower 95% CI	Upper 95% CI	p-value	Estimate	Lower 95% CI	Upper 95% CI	p-value
Intercept	33,978	29,327	38,629	0,000	42,701	38,895	46,507	0,000
Intermediate secondary	-2,865	-7,160	1,429	0,191	-6,509	-9,730	-3,288	0,000
Higher secondary	0,870	-3,519	5,259	0,698	-3,064	-6,355	0,228	0,068
Intermediate vocational	-0,558	-4,812	3,696	0,797	-4,650	-7,853	-1,447	0,004
Higher vocational	4,026	-0,237	8,289	0,064	-0,725	-3,928	2,477	0,657
University	6,694	2,345	11,044	0,003	1,539	-1,743	4,822	0,358
Attitudes	–	–	–	–	-0,541	-0,618	-0,465	0,000
Age	-0,123	-0,156	-0,091	0,000	-0,123	-0,151	-0,094	0,000
One child	-2,276	-3,213	-1,340	0,000	-1,986	-2,769	-1,203	0,000
Two children	-3,333	-4,229	-2,436	0,000	-2,312	-3,048	-1,577	0,000
Three children	-4,089	-5,359	-2,819	0,000	-3,086	-4,164	-2,007	0,000
Partner	-2,878	-3,692	-2,064	0,000	-2,646	-3,310	-1,983	0,000
Extremely urban	0,200	-0,827	1,226	0,703	-0,103	-1,111	0,906	0,842
Very urban	-0,139	-1,230	0,951	0,802	0,631	-0,224	1,485	0,148
Moderately urban	-0,908	-2,054	0,237	0,120	0,094	-0,768	0,956	0,831
Slightly urban	-0,625	-1,886	0,636	0,331	-0,403	-1,283	0,476	0,369
First gen. western	0,413	-1,636	2,462	0,693	1,193	-0,465	2,852	0,159
First gen. non-western	-0,117	-2,229	1,994	0,913	0,530	-1,163	2,222	0,540
Second gen. western	0,719	-1,008	2,445	0,414	1,669	0,286	3,052	0,018
Second gen. non-west.	-0,223	-2,286	1,839	0,832	-1,181	-3,543	1,180	0,327

Source: Authors' calculations; Data from the Longitudinal Internet studies for the Social Sciences
 Note: We include gender role attitudes index with second lag to account to be consistent with the recommendations in the literature (see Corigall and Konrad (2007) and Lietzmann and Frodermann (2021))

Table 5 presents the estimates for all the coefficients for the models that adopt weekly hours of work as a dependent variable. In Model 1, we did not include gender role attitudes as an explanatory variable. In this model, the variable of our main interest is the level of obtained education and its impact on the hours spent at work per week. A reasonable conclusion can be drawn from the results. Women in the Netherlands who have acquired higher level of education, for instance, higher vocational education or university education, on average have higher participation in the labour market by 4 and 6 working hours per week, respectively.

Regarding the control variables, we can notice a negative effect on the participation rate in the labor market of women for several factors. For instance, women in the Netherlands who have one child, on average work about 2 hours less than those who do not have a child. Those who have two children work 3 hours less over a course of one week, while women who have

three children work 4 hours less compared to the women who do not have any children. A negative effect is observed for the binary variable which indicates whether the women live with a partner. More precisely, women that live with a partner work 2.8 hours less than those that live without one. These findings confirm that family planning plays an important role in the decisions by women whether and to what extent to participate in the labour market.

In Model 2 we include the gender role attitudes as a regressor. The estimated coefficients are shown in Table 5. As a reminder, we measure the gender role attitudes through the Attitudes Index that we have created, which can take values between 5 and 25, where a higher value indicates more traditional views towards gender roles. We note that the coefficient before the gender role attitudes has a negative sign, which means that women who have more traditional attitudes related to the gender roles, on average participate less in the Dutch labour market. If the gender role attitudes index increases by one unit, then labour market participation decreases by 0.54 hours per week. Of course, we keep in mind that this is an incremental change caused by a unit increase in the Attitudes Index. It is clear that respondents who cultivate more traditional views on gender roles tend to have lower participation on the labour market.

Regarding the rest of the variables, no significant change can be noticed. Having children living at home and living with a partner still have statistically significant and negative impact on the hours spent at work per week. However, after the inclusion of the attitudes index, the effect of the education on the hours of work becomes ambiguous. Additionally, we notice that second generation immigrants of Western-European origin in the Netherlands on average work more hours per week than the respondents with Dutch origin. This may be due to the fact that the Dutch labour market is highly developed and the numerous career opportunities attract talented and diligent workers from some of the other Western European countries.

Table 6: Estimates of direct indirect and total effects on the hours of work per week

	Sobel					
	p-	Direct	Indirect	Total	Indirect	Mediation type
	value	effect	effect	effect	/ Total	
Intermediate secondary	0,252	-6,509	0,307	6,202	5%	No mediation
Higher secondary	0,001	-3,064	0,950	2,114	45%	Full mediation
Intermediate vocational	0,001	-4,650	0,873	3,777	23%	Partial mediation
Higher vocational	0,000	-0,725	1,569	0,843	186%	Full mediation
University education	0,000	1,539	2,119	3,659	58%	Full mediation

Source: Authors' calculations; Data from the Longitudinal Internet studies for the Social Sciences

The results of the causal mediation analysis are complemented with an analysis of the direct, indirect and total effect of the education level on the hours of work, mediated by the gender role attitudes. A traditional way of testing mediation hypotheses has been the Sobel test. Essentially, the Sobel test is used to determine whether a variable mediates the effect of an independent variable to the dependent variable. A significant test statistic offers evidence that an independent variable has an indirect effect, i.e. an effect is mediated in full or in part through another variable, on the outcome variable. The Sobel test statistics are shown in Table 6. As alternative approaches, Baron and Kenny's, or Zhao, Lynch and Chen's can be used. These two are shown in the Appendix.

The p-value of 0.000 of the Sobel test indicates that the mediation effect of the gender role attitudes in our model is statistically significant for all except for the intermediate secondary level of education as a predictor. Before we proceed with the interpretation of the results in Table 6, let us note that the mediation can be *partial* – which means that there is not only a significant relationship between the mediator (gender role attitudes) and the dependent variable (hours of work per week), but also some relationship between the independent variable (level of education) and dependent variable (hours of work per week), or the mediation can be *full* – in a case where there is no statistically significant relationship between the level of education and the weekly hours of work.

Let us consider the possible options. For an individual with intermediate secondary education there is no mediation. In other words, the effect on the hours of work per week arises entirely from the level of education, and the gender role attitudes do not play a significant role. However, for an individual with higher secondary education level there is full mediation. This means that the decision to participate in the labour market, as proxied by the hours of work, is primarily dependent on the gender role attitudes as a mediator. 45% of the effect of the intermediate secondary education on the hours of work is mediated by the gender role attitudes. Furthermore, partial mediation can be found for an individual who has intermediate vocational education level. 23% of the total effect on the weekly hours of work is mediated by the views on the gender roles. Full mediation can be found when it comes to the individuals who have obtained higher vocational education. Finally, we can infer that as much as 58% of the total effect of the university education on the hours of work per week is mediated by the gender role attitudes. These findings, accompanied by the output estimates shown in Table 5 prove true out hypothesis that gender role attitudes have significant and large impact on the decision of women to participate in the Dutch labour market.

VI. Discussion of the findings

The Netherlands has long been viewed as the country in which the female population has low labor market participation. In the period from 1990 until today, there has been a significant increase in the participation of women in the Dutch labor market, but the level of participation which is 59.9% remains significantly lower than the level of participation among men which is 69.3%. This increase in the participation is mainly due to the increase in the share of women in part-time employment. While the share of men working part-time accounts for 19%, women's rate goes as high as 60%. All of this is becoming more puzzling if we consider the fact that the OECD and the European Values Study (Halman et al. 2011) argue that Dutch women have the weakest work ethic compared to women in other European countries.

As this study analysis the role of gender role attitudes as an important aspect of the decision-making processes and behaviour, it provides insights regarding the relationships between attitude, education investment and labour market participation. The first sub-goal of this study was to analyse the role that gender role attitudes play in women's education investment. We were also interested in focusing on the direction of causality in this relationship. The second sub-goal was to gain a better understanding of the relationship between gender role attitudes, education and labour market participation. In order to achieve these goals, we have analysed the LISS Data on Dutch women aged between 25 and 70. For the first sub-goal we applied ordered probit analysis, while for the second sub-goal we implemented a mediation model. This has led to some interesting findings.

First of all, we found that the gender role attitudes were systematically related to background characteristics and religious views and that these attitudes were weakly exogenous with respect to the educational attainment. Moreover, we have found strong negative impact of the traditional gender role attitudes on educational attainment. This confirms our initial hypothesis that gender role attitudes play an important role in the decision-making process when it comes to pursuing higher level of education. In other words, women in the Netherlands who have more traditional views related to the gender roles are less likely to pursue higher levels of education. Given that our dependent variable - level of education - is a categorical variable, we proceeded with an analysis of the marginal impact of the gender role attitudes index on each individual level of education. From the analysis we were able to conclude that traditional gender role attitudes play a significant limiting role in terms of investing in education, especially when it comes to higher levels of education such as higher vocational

education and university level of education. These findings are in line with the findings of Vella (1994).

In the second part of our analysis, we applied a structural equation mediation model through which we tried to clarify the relationship between gender role attitudes, level of education and labour market participation. We found that gender role attitudes also play an important role in women's decision-making to participate in the Dutch labour market. Women who have more traditional attitudes related to the gender roles, on average participate less in the Dutch labour market. Moreover, we have found that the effect of education on labour market participation is mediated by the gender role attitudes, and oftentimes there is full mediation effect. Women with more traditional gender role attitudes are less likely to work and, if they have a paid job, they work fewer hours per week. Our findings from this part of the study are consistent with the findings of Stam et al. (2014), Lietzmann and Frodermann (2021), Schober and Scott (2012). It seems that more egalitarian gender role attitudes contribute to lowering the gender employment gap. Interestingly, Khoudja and Fleischmann (2018) find no relation between gender ideology at a given wave and the *change* in women's hours of work in the Netherlands. However, they argue that this does not mean that gender attitudes do not influence the total number of hours women spend in the labour market. The authors explain that women can either not change their hours worked having a full-time job or having a small part-time job, with the former being an indicator of less and the latter of more traditional gender role attitudes. Hence, the lack of evidence in their study regarding the relationship between gender role attitudes and change in hours of work only suggests that "once women settled on a certain extent of involvement in the labour market, their gender ideology is not a strong driver for change in the quantity of their labour market involvement" (Khoudja and Fleischmann, 2018).

This leads us to think about the context of the study. As it was mentioned in the introduction, the Netherlands is an interesting case due to the high level of availability of part-time jobs. Therefore, for many women it is their free choice to work part-time and they are not willing to work more (Wielers and Raven, 2009). With this in mind, the question that consequently arises is to what extent these results will be applicable to other countries, since the context in which women make their labour market participation decisions in those countries might be different. Further research might be able to provide more insights, especially one that incorporates comparative analysis between two or more countries. These results should not be interpreted as an evidence against females behaving optimally. We simply conclude that traditional gender role attitudes affect education and labour market decisions.

VII. Conclusion and outlook

This study aimed to investigate the link between the gender role attitudes and the investment in education on one hand, and the labour market participation on the other hand. Strong negative impact of the traditional gender role attitudes on educational attainment has been found. To our knowledge, there has not yet been conducted a research on this topic. Therefore, further research is needed to additionally elucidate the impact of the traditional gender views that run within families and the level of education that female members of those families attain. Gender role attitudes is one of the factors that determine the decision whether it is worth pursuing higher levels of education, however, as we have seen in this study, it seems to play a significant role, thus its neglect leads to the danger of females *not* achieving their highest human capital potentials. This problem gets more complicated by the fact that the decision to invest in education is influenced not only by personal gender role attitudes, but also by the views and ideology considering the gender roles of parents and partner (Vella, 1994).

In addition, we found that women with more traditional gender role attitudes are less likely to work and, if they have a paid job, they work fewer hours per week. With this, we proved to be right both of our initial hypotheses. The conclusions of our mediation model largely correspond to the findings of previous research on the role and influence of gender role attitudes and the women's decision to participate in the Dutch labour market (Stam et al. 2014; Khoudja and Fleischmann, 2018). However, in their research, Stam et al. (2014) focus on the impact of work ethic on labour market participation, while treating gender role attitudes as a control variable. Additionally, the primary dependent variable in the study by Khoudja and Fleischmann (2018) is women's entries and exits in the Dutch labour market, while focusing on the joint gender ideology with the partner. However, neither of these two papers provides a comprehensive approach in the creation of gender role attitudes index and demystifying its relationship with the level of education and labour market participation of women in the Netherlands, as we did. Thankfully to the LISS Data we were able to investigate this relationship using longitudinal data dating to 2021, thus examining this issue from today's perspective.

Limitations

This study recognizes a series of limitations in its results and conclusions. First, an initial limitation is related to the notion of causality. Although in the first part of the analysis we have provided evidence of weak exogeneity of gender role attitudes with respect to the education level, this has not really been tested sufficiently. In the mediation model, our study has

considered a soft modelling approach directed more towards prediction than causality. The prediction is an ability that guarantees only a limited degree of control (Falk and Miller, 1992). In any case, in the models constructed and applied in this study we have implemented gender role attitudes index with two-year lag as a variable, in order to be more confident in the causal interpretation of the results.

A second limitation is the lack of some important control variables, especially those related to the environment in which the individuals were reared and grew up, and under whose influence gender role attitudes were formed from an early age. Here we primarily talk about variables that indicate characteristics of the parents of the individuals, for instance whether the individual lived with two parents or one parent only, whether their mother worked during their childhood, the level of education of their mother, the number of siblings the individual has and so on. Another variable that would have been useful to have as a control is the type of school the individual respondents were educated in. Unfortunately, these variables were not available in the dataset.

The third limitation refers to the construction of the gender role attitudes index. Once again, we took into account five statements from the LISS questionnaire in which the respondents had to indicate the extent of agreement with each of those. The data collected in this way were aggregated and we got the Attitudes Index which ranges from 5 (extremely egalitarian views) to 25 (extremely traditional views). This procedure has several drawbacks. First, the numerical valuation of the level of agreement with a given statement may be unrealistic. Second, the offered responses might not have had the same meaning for each individual. Third, equal weight was assigned to each statement. Finally, there is a real doubt the accuracy of the given answer. However, given the second option which suggested inclusion of all the five statements as separate categorical variables, and that their explicit high correlation level could have led to a high degree of multicollinearity in the models of this study, we believe that our choice to create attitudes index is justified.

Finally, the advantages and disadvantages of the gender role attitudes index constructed in this way depend highly on the characteristics of the empirical context that is analysed. For the purposes of our research, this index has successfully incorporated the views of individuals included in the sample regarding gender roles in the household and society. These limitations suggest paths for future academic work that aims to further examine the topics that we have addressed in this study.

Policy recommendations

We have seen that women's education and labour market decisions are not influenced purely by economic factors and market pressure, but also by their gender role attitudes. Therefore, women's ideology and attitudes play a central role in understanding their contemporary labour market behaviour. This means that policy makers who aim to stimulate and increase women's labour market participation should not neglect women's attitudes. Although the impact of number of children on the labour market participation is not the focus of this study, we have found that it has a negative effect. This problem can be solved through continuous reforms and adjustments of childcare models and providing support to parents, especially mothers, in raising their children.

By the same logic, if policy makers want to see an increase in women's efforts on the labour market and an increase in their working hours, it would help to promote more egalitarian gender role values. We have seen that gender role attitudes are formed in early childhood, but not necessarily inside the formal education. Hence, interventions implemented to encourage a change in the views towards gender role attitudes should be individualistic, i.e. they should be focused on the family and the environment where individuals develop from a young age. This requires high level of creativity among policy making teams, where policies will incorporate the findings and advices of the behavioural economics. Moreover, policy makers will have to try to increase work ethic by stimulating the moral duty to work. This is due to the low work ethic of women in the Netherlands that has been reported in a number of studies (Halman et al. 2011; Wielers and Raven, 2013).

By identifying the dimensions of the gender role attitudes and showing that they play a critical mediating role in the labour market, labour market policy makers will be able to manage their activities more strategically and hopefully improve the labour market performance.

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Appendix

Table A1: Descriptive statistics of the variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Education					
Primary school	23361	0,0264	0,1602	0	1
Intermediate secondary educ.	23361	0,2305	0,4212	0	1
Higher secondary education	23361	0,0900	0,2862	0	1
Intermediate vocational educ.	23361	0,2765	0,4473	0	1
Higher vocational education	23361	0,2713	0,4447	0	1
University education	23361	0,1053	0,3069	0	1
Gender role attitudes	18724	11,0619	3,9685	5	25
Hours of work per week	16581	26,0500	13,0323	0	100
Age	23361	49,5128	12,4764	25	70
Number of children					
One child	23361	0,1502	0,3572	0	1
Two children	23361	0,2065	0,4048	0	1
Three children	23361	0,0714	0,2575	0	1
Partner	23361	0,7170	0,4505	0	1
Level of urbanisation					
Very urban	23186	0,2483	0,4320	0	1
Moderately urban	23186	0,2188	0,4134	0	1
Slightly urban	23186	0,2053	0,4039	0	1
Not urban	23186	0,1730	0,3783	0	1
Origin					
First gen. western	22629	0,0414	0,1991	0	1
First gen. non-western	22629	0,0403	0,1968	0	1
Second gen. western	22629	0,0512	0,2204	0	1
Second gen. non-west.	22629	0,0183	0,1342	0	1
Religion					
Protestant	6887	0,2894	0,4535	0	1
Eastern Orthodox	6887	0,0093	0,0960	0	1
Evangelic	6887	0,0354	0,1849	0	1
Dutch Reformed	6887	0,0884	0,2839	0	1
Reformed	6887	0,0302	0,1712	0	1
Other Christian	6887	0,0331	0,1789	0	1
Hinduism	6887	0,0030	0,0551	0	1
Buddhism	6887	0,0122	0,1098	0	1
Judaism	6887	0,0051	0,0711	0	1
Islam	6887	0,0161	0,1259	0	1
Humanism	6887	0,0007	0,0269	0	1
Other non-Christian	6887	0,0028	0,0525	0	1

Table A2: Reduced form equation; Gender role attitudes as a dependent variable

	Coef.	Robust Std. Error	t	P>t	[95% Conf. Interval]	
Age	0,0329	0,0095	3,4500	0,0010	0,0142	0,0517
Number of children						
One child	0,3738	0,3137	1,1900	0,2340	-0,2416	0,9892
Two children	0,1884	0,2871	0,6600	0,5120	-0,3747	0,7514
Three children	0,8754	0,3957	2,2100	0,0270	0,0993	1,6516
Partner	0,1472	0,2613	0,5600	0,5730	-0,3654	0,6598
Level of urbanisation						
Very urban	0,4740	0,3709	1,2800	0,2020	-0,2536	1,2015
Moderately urban	0,7562	0,3789	2,0000	0,0460	0,0131	1,4994
Slightly urban	0,7732	0,3770	2,0500	0,0400	0,0337	1,5126
Not urban	0,7379	0,3993	1,8500	0,0650	-0,0453	1,5211
Origin						
First gen. western	0,7679	0,4929	1,5600	0,1190	-0,1989	1,7347
First gen. non-western	0,6959	0,5140	1,3500	0,1760	-0,3124	1,7042
Second gen. western	-0,3539	0,6687	-0,5300	0,5970	-1,6656	0,9579
Second gen. non-west.	0,9190	0,9456	0,9700	0,3310	-0,9359	2,7738
Religion						
Protestant Church	-0,1554	0,2462	-0,6300	0,5280	-0,6383	0,3275
Eastern Orthodox	0,8923	0,7403	1,2100	0,2280	-0,5598	2,3444
Evangelical	1,6130	0,4233	3,8100	0,0000	0,7827	2,4432
Dutch Reformed	1,6964	0,3435	4,9400	0,0000	1,0226	2,3703
Reformed Churches	2,1342	0,4744	4,5000	0,0000	1,2038	3,0647
Other Christian	1,6135	0,4827	3,3400	0,0010	0,6668	2,5603
Hinduism	0,6502	0,8639	0,7500	0,4520	-1,0443	2,3447
Buddhism	1,0396	0,8064	1,2900	0,1980	-0,5422	2,6214
Judaism	-0,1498	0,8813	-0,1700	0,8650	-1,8785	1,5789
Islam / Muslim	3,5253	0,7357	4,7900	0,0000	2,0824	4,9683
Humanism	-0,1990	2,8911	-0,0700	0,9450	-5,8698	5,4718
Other non-Christian	1,4993	1,4348	1,0400	0,2960	-1,3150	4,3136
Intercept	8,9865	0,6554	13,7100	0,0000	7,7010	10,2721

Table A3: Weak exogeneity test of the gender role attitudes with respect to the level of education

	Coef.	Robust Std. Error	z	P>z	[95% Conf. Interval]	
Attitudes	-0,0862	0,0367	-2,3500	0,0190	-0,1581	-0,0144
Age	-0,0330	0,0030	-11,0600	0,0000	-0,0388	-0,0271
Number of children						
One child	0,0994	0,0838	1,1900	0,2360	-0,0649	0,2637
Two children	0,1392	0,0790	1,7600	0,0780	-0,0157	0,2940
Three children	0,1436	0,1096	1,3100	0,1900	-0,0712	0,3585
Partner	-0,1171	0,0752	-1,5600	0,1190	-0,2646	0,0303
Level of urbanisation						
Very urban	-0,1020	0,1225	-0,8300	0,4050	-0,3421	0,1380
Moderately urban	-0,1520	0,1264	-1,2000	0,2290	-0,3998	0,0958
Slightly urban	-0,3138	0,1284	-2,4400	0,0150	-0,5654	-0,0622
Not urban	-0,1610	0,1287	-1,2500	0,2110	-0,4133	0,0913
Origin						
First gen. western	0,4676	0,2141	2,1800	0,0290	0,0479	0,8873
First gen. non-western	-0,1289	0,1744	-0,7400	0,4600	-0,4706	0,2129
Second gen. western	0,1197	0,1730	0,6900	0,4890	-0,2193	0,4587
Second gen. non-west.	0,1031	0,3252	0,3200	0,7510	-0,5343	0,7405
Residuals	0,0219	0,0360	0,6100	0,5420	-0,0486	0,0924
/cut1	-5,0188	0,4071			-5,8167	-4,2209
/cut2	-3,5084	0,3921			-4,2768	-2,7399
/cut3	-3,2637	0,3913			-4,0306	-2,4968
/cut4	-2,4599	0,3885			-3,2213	-1,6985
/cut5	-1,3815	0,3822			-2,1306	-0,6324

Table A4: Ordered Probit model estimates of the effects of the gender role attitudes on the level of education of women in the Netherlands

	Coef.	Robust Std. Error	z	P>z	[95% Conf. Interval]	
Attitudes (2 nd lag)	-0,0800	0,0053	15,0800	0,0000	-0,0904	-0,0696
Age	-0,0310	0,0020	15,6700	0,0000	-0,0349	-0,0271
Number of children						
One child	0,0337	0,0572	0,5900	0,5550	-0,0783	0,1458
Two children	0,0742	0,0567	1,3100	0,1910	-0,0370	0,1854
Three children	0,0693	0,0831	0,8300	0,4050	-0,0936	0,2321
Partner	-0,1355	0,0511	-2,6500	0,0080	-0,2357	-0,0353
Level of urbanisation						
Very urban	-0,2335	0,0745	-3,1300	0,0020	-0,3795	-0,0875
Moderately urban	-0,3000	0,0779	-3,8500	0,0000	-0,4527	-0,1474
Slightly urban	-0,2946	0,0780	-3,7800	0,0000	-0,4475	-0,1417
Not urban	-0,2271	0,0801	-2,8400	0,0050	-0,3840	-0,0701
Origin						
First gen. western	0,4388	0,1548	2,8400	0,0050	0,1355	0,7421
First gen. non-western	0,0557	0,1476	0,3800	0,7060	-0,2337	0,3450
Second gen. western	0,0056	0,1003	0,0600	0,9550	-0,1909	0,2021
Second gen. non-west.	0,1031	0,1655	0,6200	0,5330	-0,2213	0,4275
/cut1	-4,9654	0,1662			-5,2912	-4,6396
/cut2	-3,4849	0,1424			-3,7640	-3,2059
/cut3	-3,1806	0,1408			-3,4566	-2,9046
/cut4	-2,3777	0,1372			-2,6466	-2,1087
/cut5	-1,2787	0,1352			-1,5437	-1,0138

Table A5-1: Complete estimates of the mediation model; Hours of work per week as a dependent variable

	Coef.	OIM Std. Err.	z	P>z	[95% Conf. Interval]	
Structural mediation modelling						
<i>Hours of work per week</i>						
Attitudes (2 nd lag)	-0,5415	0,0391	-13,8600	0,0000	-0,6181	-0,4649
Level of education						
Intermediate secondary	-6,5087	1,6435	-3,9600	0,0000	-9,7299	-3,2876
Higher secondary educ.	-3,0636	1,6795	-1,8200	0,0680	-6,3552	0,2281
Intermediate vocational	-4,6498	1,6342	-2,8500	0,0040	-7,8528	-1,4468
Higher vocational educ.	-0,7252	1,6340	-0,4400	0,6570	-3,9278	2,4773
University education	1,5393	1,6749	0,9200	0,3580	-1,7434	4,8219
Age	-0,1226	0,0146	-8,4100	0,0000	-0,1511	-0,0940
Number of children						
One child	-1,9860	0,3996	-4,9700	0,0000	-2,7691	-1,2028
Two children	-2,3122	0,3752	-6,1600	0,0000	-3,0477	-1,5768
Three children	-3,0856	0,5502	-5,6100	0,0000	-4,1640	-2,0072
Partner	-2,6463	0,3385	-7,8200	0,0000	-3,3097	-1,9828
Level of urbanisation						
Extremely urban	-0,1025	0,5147	-0,2000	0,8420	-1,1113	0,9062
Very urban	0,6305	0,4361	1,4500	0,1480	-0,2243	1,4854
Moderately urban	0,0940	0,4400	0,2100	0,8310	-0,7684	0,9563
Slightly urban	-0,4033	0,4486	-0,9000	0,3690	-1,2826	0,4759
Origin						
First gen. western	1,1933	0,8462	1,4100	0,1590	-0,4653	2,8519
First gen. non-western	0,5298	0,8636	0,6100	0,5400	-1,1628	2,2224
Second gen. western	1,6691	0,7054	2,3700	0,0180	0,2865	3,0517
Second gen. non-west.	-1,1815	1,2050	-0,9800	0,3270	-3,5433	1,1804
Intercept	42,7009	1,9419	21,9900	0,0000	38,8949	46,5069

Table A5-2: Complete estimates of the mediation model; Gender role attitudes as a dependent variable

	Coef.	OIM Std. Err.	z	P>z	[95% Conf. Interval]	
<i>Attitudes (2nd lag)</i>						
Level of education						
Intermediate secondary	-0,5672	0,4938	-1,1500	0,2510	-1,5351	0,4007
Higher secondary educ.	-1,7544	0,5043	-3,4800	0,0010	-2,7427	-0,7660
Intermediate vocational	-1,6121	0,4907	-3,2900	0,0010	-2,5739	-0,6503
Higher vocational educ.	-2,8970	0,4898	-5,9100	0,0000	-3,8571	-1,9370
University education	-3,9140	0,5012	-7,8100	0,0000	-4,8964	-2,9317
Age	-0,0305	0,0044	-6,9900	0,0000	-0,0390	-0,0219
Number of children						
One child	-0,0321	0,1201	-0,2700	0,7890	-0,2674	0,2032
Two children	-0,0234	0,1128	-0,2100	0,8350	-0,2445	0,1976
Three children	0,3618	0,1653	2,1900	0,0290	0,0379	0,6858
Partner	0,1423	0,1017	1,4000	0,1620	-0,0570	0,3416
Level of urbanisation						
Extremely urban	-0,7715	0,1544	-5,0000	0,0000	-1,0741	-0,4689
Very urban	-0,2525	0,1310	-1,9300	0,0540	-0,5094	0,0043
Moderately urban	-0,1201	0,1322	-0,9100	0,3640	-0,3792	0,1390
Slightly urban	0,1202	0,1348	0,8900	0,3730	-0,1440	0,3844
Origin						
First gen. western	1,4747	0,2537	5,8100	0,0000	0,9775	1,9720
First gen. non-western	1,4977	0,2589	5,7800	0,0000	0,9902	2,0052
Second gen. western	0,0559	0,2120	0,2600	0,7920	-0,3596	0,4714
Second gen. non-west.	0,1528	0,3621	0,4200	0,6730	-0,5569	0,8626
Intercept	14,0522	0,5597	25,1000	0,0000	12,9552	15,1493
var(e.workhours)	146,0408	2,4243			141,3658	150,8704
var(e.lag2Attitudes)	13,1879	0,2189			12,7658	13,6241

Table A6-1: Significance testing of the mediation effect, complete estimates; Intermediate secondary education

Intermediate secondary education			
Estimates	Delta	Sobel	Monte Carlo
Indirect effect	0,307	0,307	0,308
Std. Error	0,268	0,268	0,268
z-value	1,145	1,145	1,148
p-value	0,252	0,252	0,251

Baron and Kenny approach to testing mediation:

(X->M) with $\beta = -0,567$ and $p = 0,251$
(M->Y) with $\beta = -0,541$ and $p = 0,000$
As either STEP 1 or STEP 2 (or both) are not significant, there is no mediation!

Zhao, Lynch & Chen's approach to testing mediation:

(X->M) with $\beta = -6,509$ and $p = 0,000$
As the Monte Carlo test above is not significant and STEP 1 is significant you have no mediation!

Indirect effect / Total effect

$(0,307 / 6,202) = 0,050$
Meaning that about 5% of the effect of the Intermediate secondary education on the working hours is mediated by the gender role attitudes!

Indirect effect / Direct effect

$(0,307 / 6,509) = 0,047$
The mediated effect is about 0,0 times as large as the direct effect of the Intermediate secondary education on the working hours!

Table A6-2: Significance testing of the mediation effect, complete estimates; Higher secondary education

Higher secondary education			
Estimates	Delta	Sobel	Monte Carlo
Indirect effect	0,95	0,95	0,95
Std. Error	0,282	0,282	0,281
z-value	3,374	3,374	3,376
p-value	0,001	0,001	0,001

Baron and Kenny approach to testing mediation:

(X->M) with $\beta = -1,754$ and $p = 0,001$

(M->Y) with $\beta = -0,541$ and $p = 0,000$

(X->Y) with $\beta = -3,064$ and $p = 0,068$

As STEP 1, STEP 2 and the Sobel's test above are significant and STEP 3 is not significant the mediation is complete!

Zhao, Lynch & Chen's approach to testing mediation:

(X->Y) with $\beta = -3,064$ and $p = 0,068$

As the Monte Carlo test above is significant and STEP 1 is not significant you have full mediation!

Indirect effect / Total effect

$(0,307 / 6,202) = 0,050$

Meaning that about 45% of the effect of the Higher secondary education on the working hours is mediated by the gender role attitudes!

Indirect effect / Direct effect

$(0,950 / 3,064) = 0,310$

The mediated effect is about 0,3 times as large as the direct effect of the Higher secondary education on the working hours!

Table A6-3: Significance testing of the mediation effect, complete estimates; Intermediate vocational education

Intermediate vocational education			
Estimates	Delta	Sobel	Monte Carlo
Indirect effect	0,873	0,873	0,873
Std. Error	0,273	0,273	0,273
z-value	3,197	3,197	3,199
p-value	0,001	0,001	0,001

Baron and Kenny approach to testing mediation:

(X->M) with $\beta = -1,612$ and $p = 0,001$

(M->Y) with $\beta = -0,541$ and $p = 0,000$

(X->Y) with $\beta = -4,650$ and $p = 0,004$

As STEP 1, STEP 2 and STEP 3 as well as the Sobel's test above are significant the mediation is partial!

Zhao, Lynch & Chen's approach to testing mediation:

(X->Y) with $\beta = -4,650$ and $p = 0,004$

As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in opposite direction, you have partial mediation!

Indirect effect / Total effect

$$(0,873 / 3,777) = 0,231$$

Meaning that about 23% of the effect of the Intermediate vocational education on the working hours is mediated by the gender role attitudes!

Indirect effect / Direct effect

$$(0,873 / 4,650) = 0,188$$

The mediated effect is about 0,2 times as large as the direct effect of the Intermediate vocational education on the working hours!

Table A6-4: Significance testing of the mediation effect, complete estimates; Higher vocational education

Higher vocational education			
Estimates	Delta	Sobel	Monte Carlo
Indirect effect	1,569	1,569	1,569
Std. Error	0,288	0,288	0,288
z-value	5,440	5,440	5,441
p-value	0,000	0,000	0,000

Baron and Kenny approach to testing mediation:

(X->M) with $\beta = -2,897$ and $p = 0,000$
(M->Y) with $\beta = -0,541$ and $p = 0,000$
(X->Y) with $\beta = -0,725$ and $p = 0,657$
As STEP 1, STEP 2 and the Sobel's test above are significant and STEP 3 is not significant the mediation is complete!

Zhao, Lynch & Chen's approach to testing mediation:

(X->Y) with $\beta = -0,725$ and $p = 0,657$
As the Monte Carlo test above is significant and STEP 1 is not significant you have full mediation!

Indirect effect / Total effect
 $(1,569 / 0,843) = 1,860$
Meaning that about 186% of the effect of the Higher vocational education on the working hours is mediated by the gender role attitudes!

Indirect effect / Direct effect
 $(1,569 / 0,725) = 2,163$
The mediated effect is about 2,2 times as large as the direct effect of the Higher vocational education on the working hours!

Table A6-5: Significance testing of the mediation effect, complete estimates; University education

University education			
Estimates	Delta	Sobel	Monte Carlo
Indirect effect	2,119	2,119	2,119
Std. Error	0,311	0,311	0,311
z-value	6,804	6,804	6,806
p-value	0,000	0,000	0,000

Baron and Kenny approach to testing mediation:

(X->M) with $\beta = -3,914$ and $p = 0,000$
(M->Y) with $\beta = -0,541$ and $p = 0,000$
(X->Y) with $\beta = 1,539$ and $p = 0,358$
As STEP 1, STEP 2 and the Sobel's test above are significant and STEP 3 is not significant the mediation is complete!

Zhao, Lynch & Chen's approach to testing mediation:

(X->Y) with $\beta = 1,539$ and $p = 0,358$
As the Monte Carlo test above is significant and STEP 1 is not significant you have full mediation!

Indirect effect / Total effect

$(2,119 / 3,659) = 0,579$
Meaning that about 58% of the effect of the University education on the working hours is mediated by the gender role attitudes!

Indirect effect / Direct effect

$(2,119 / 1,539) = 1,377$
The mediated effect is about 1,4 times as large as the direct effect of the University education on the working hours!