

# THE INDEPENDENT WOMAN - LOCUS OF CONTROL AND FEMALE LABOR FORCE PARTICIPATION\*

**Juliane Hennecke**<sup>†</sup>  
(Freie Universität Berlin)

September 22, 2018

**Job Market Paper**

*For the latest version, please visit <http://julianehennecke.com/>*

## Abstract

While the majority of economic studies on female labor force participation relies on monetary incentives in order to explain the labor supply decision of women, the research on non-monetary and psychological factors is still relatively scarce. Based on earlier findings from labor economics, this paper focuses on the role of locus of control for the explanation of a woman's participation decisions. Locus of control (LOC) is a personality trait that measures an individual's belief about the causal relationship between own behavior and its consequences for life and hence is a crucial determinant of subjective expectations about monetary and non-monetary rewards to own efforts. In this paper, LOC is thus theoretically assumed to affect participation probabilities via differences in the relative importance and expected size of monetary and non-monetary incentives for market production. The implications of the theoretical idea are tested using German survey data from the SOEP in a reduced form approach. I find strong indication for a significant positive effect of an internal LOC on a woman's probability to be available for market production also conditional on commonly known traditional socio-economic determinants of participation. Additionally, the relationship is found to be strongly heterogeneous with respect to determinants of underlying monetary and non-monetary incentives such as family status, existence and age of children as well as cohort and region of living. Those findings strongly support the hypothesis that internal women put a higher weight on social purpose and economic identity as non-monetary incentives for working and thus gain higher marginal utility from participation also conditional on monetary incentives.

**Keywords:** Locus of Control, Labor Supply, Female Labor Force Participation, Gender Differences, SOEP

**JEL codes:** J21, J22, J12, J13, J16

---

\**Acknowledgements:* The author is very grateful to Ronnie Schöb, Deborah Cobb-Clark, Marco Caliendo, Clemens Hetschko and Malte Preuss as well as participants at the ESPE 2018 in Antwerp and the SABE/IAREP 2018 in London for helpful comments.

<sup>†</sup>e-Mail: [juliane.hennecke@fu-berlin.de](mailto:juliane.hennecke@fu-berlin.de), Freie Universität Berlin, Chair of International Public Economics, Boltzmannstr. 20, D-14195 Berlin/ Germany.

# 1 Introduction

The research on female labor force participation has a long tradition. Triggered by the growing labor supply of especially married women in the second half of the last century<sup>1</sup>, a large strain of theoretical and empirical research on this new issue arose. Inspired by the work of Mincer (1962), the early literature largely focused on the increase in the average wage rate of women to explain the positive trend (see e.g. Mincer, 1985; Smith and Ward, 1985; Blau and Kahn, 2007; Juhn and Murphy, 1997). Large parts of this decrease in wage inequalities were explained by increasing returns to human capital for women (see e.g. Autor *et al.*, 2008; Blau, 1998; McGrattan and Rogerson, 2008). Although the wage rates of women and men did converge and the female wage elasticity fell over time (Blau and Kahn, 2007; Costa, 2000; Heim, 2007), we know that the participation rate and the average number of working hours per week of especially married women are still considerably lower than that of their partners and that also the gap in wage elasticity especially at the extensive margin has not closed yet (Evers *et al.*, 2008; Blau and Kahn, 2017). Based on the growing theoretical considerations of joint family labor supply equations, empirical studies additionally found a strong and stable response of female labor supply to changes in their partners' wages, whereas no such responsiveness can be identified for men (Ashenfelter and Heckman, 1974; Lundberg, 1988; Devereux, 2004). In addition to considerations about wage and cross-wage responses of female labor supply, the conventional theoretical models were largely focused on overall declines in fertility rates – e.g. through the improvement of fertility control (Goldin and Katz, 2002; Bailey, 2006) – the improvement of household technologies (Greenwood *et al.*, 2005) as well as the rise of the tertiary sector (Cortes and Pan, 2018; Weinberg, 2000; Oppenheimer, 1970) and a generally increased economic demand (Angrist, 2002; Carodso and Morin, 2018) in order to explain the observed trends (see e.g. Costa, 2000; Blau and Kahn, 2017; Mincer, 1985; Smith and Ward, 1985). Over the years, multiple new strains of research evolved, which to a large extent focused on alternative monetary factors behind (the lack of) female labor force participation such as institutional barriers and public policy (e.g. tax incentives, transfer withdrawal rates and childcare provision) (see e.g. Blundell and MaCurdy, 1999; Hausman, 1980; Eissa and Liebman, 1996) as well as costs of participation in general (e.g. transportation and childcare) (see e.g. Cogan, 1980; Gronau, 1973; Angrist and Evans, 1998).

However, as is summarized by Blau and Kahn (2007, 2017), all those conventional economic studies were not able to fully explain the observed trends in female labor force participation as

---

<sup>1</sup>See Killingsworth and Heckman (1986), Blau and Kahn (2007), Costa (2000), Goldin (1990) and Mincer (1985) for comprehensive overviews over the trends in female labor force participation during the 20th century.

well as the remaining gender gaps. This is why the economic research started to consider non-standard determinants of the developments especially by discussing and empirically analyzing the role of social norms and gender role attitudes as important non-pecuniary factors (see e.g. Bertrand, 2010; Fortin, 2015; Goldin, 2006; Reimers, 1985; Costa, 2000; Carodso and Morin, 2018). This literature is in line with the sociological literature on the transformation of traditional gender roles over time (Cotter *et al.*, 2011; Ross *et al.*, 1983). As is nicely summarized by Goldin (2006), one key aspect of the “*quite revolution of women’s employment*” since the 1970s is the increasing importance of work, occupation and career as key aspects for a woman’s social identity. Those considerations are based on the economic and sociological research on the importance of social purpose as well as economic identity and status as non-pecuniary incentives of labor force participation in general (Jahoda, 1981; Akerlof and Kranton, 2000). The main message of this literature is straightforward: The individual identity influences economic outcomes as deviating from the socially desirable behavior is costly for the individual. Thus, not working is associated with very high non-monetary costs for the individual through losses in social purpose and economic identity and thus significantly reduces the individual well-being, independent from the monetary distress (see e.g. Clark, 2003; Schöb, 2013; Hetschko *et al.*, 2014). Traditional gender roles and the associated gender differences in the acceptance of home production as a alternative to market production (see e.g. Killingsworth and Heckman, 1986)<sup>2</sup> are very likely to be important drivers of differences in the importance of those social norms between men and women (see e.g. Bertrand *et al.*, 2015; Knabe *et al.*, 2016; Charles *et al.*, 2018). Thus, when explaining gender differences in labor force participation, non-pecuniary incentives for working are likely to be crucial.

Nevertheless, what cannot be explained by level differences in social norms for working and traditional gender roles are differences in the participation decisions between women. The importance of social norms for working as well as economic identity from working as incentives for participation seem to be highly heterogeneous between women. Thus, the remaining open question is, what drives differences in the labor force participation between women if objective monetary and non-monetary (dis)incentives for working are held constant. As a potential determinant of this heterogeneity, psychological factors – such as individual personality – might be highly important.

Based on these considerations, this paper attempts to investigate the role of the personality

---

<sup>2</sup>Killingsworth and Heckman (1986) state that men and women might especially differ with respect to their alternative use of time besides market production. Home production is socially more accepted as an outside option for women than for men and the negative effects of non-employment on social identity might thus be higher for men as for them the social norm of being the “breadwinner” of the family is stronger, and social pressure for working is higher.

trait locus of control (LOC) for the labor force participation of women. Locus of control can be characterized as a “*generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one’s own behavior and its consequences*” (Rotter, 1966) and describes whether individuals believe in the effects of their own efforts on their lives’ outcomes. Based on social learning theory, Rotter (1966) defined locus of control as a trait which mainly describes the “*nature and effects of reinforcement*”. While individuals with a high LOC (Internals) tend to perceive reinforcements as being a causal consequence from own actions and efforts, individuals with a low LOC (Externals) contribute those reinforcements to luck, chance, fate or other people. LOC has already been shown to have a tremendous positive effect on “desirable” behavior and decision making on the labor market such as e.g. human capital investment (Coleman and DeLeire, 2003), job-search effort (McGee and McGee, 2016; Caliendo *et al.*, 2015b), occupational attainment (Heywood *et al.*, 2017; Cobb-Clark and Tan, 2011), entrepreneurial activity (Caliendo *et al.*, 2014) and labor market mobility (Caliendo *et al.*, 2015a).<sup>3</sup> Nevertheless, literature that directly relates female labor force participation to locus of control is scarce. Most prominently, Heckman *et al.* (2006) find a significant positive effect of locus of control and self-esteem on the individual probability of being employed at age 30 which is more pronounced for females. In a more recent study, Berger and Haywood (2016) analyze the effect of locus of control on womens’ return to employment after parental leave. Using German survey data, they find that women with an internal locus of control return to employment more quickly. Concerning other personality traits, Wichert and Pohlmeier (2010) find that also the Big-Five personality traits play a significant role in explaining women’s labor supply.

In this paper, the theoretical considerations are based on the idea that locus of control, in line with its definition, crucially determines a woman’s subjective expectations about monetary and non-monetary rewards to participation. It is thus assumed to affect the participation probability via differences in the relative importance and the expected size of monetary and non-monetary (dis)incentives for market production in the decision-making process. Three main alternative theories are hypothesized. Firstly, women with an internal LOC might derive more non-pecuniary utility from the status of being a labor market participant, as they perceive the positive effects of employment on social status to be directly correlated with their own efforts. They thus put a greater weight on the status of being employed in order to achieve a controlling influence over their own life also conditional on monetary returns. Secondly, as a directly conflicting theory, internal women might also derive lower non-pecuniary utility from participation as they are largely independent from social norms as external determinant of their individual well-

---

<sup>3</sup>See Cobb-Clark (2015) for a comprehensive overview over the literature on LOC in labor economics.

being. Thirdly, LOC might of course also affect monetary rewards to participation. Internal women might have higher expectations about returns to job-search and working and thus higher subjective monetary incentives for working in general.

In the empirical part of the paper, I estimate the direct relationship between LOC and current labor force participation of a woman using a reduced form approach. The estimations are conducted using the extensive information available from the Socio-Economic Panel (SOEP, 2017), a large representative longitudinal household panel from Germany. The SOEP not only includes detailed socio-economic information but also surveys individuals' locus of control on a regular basis. Based on this data, I estimate the average marginal effects of a woman's LOC on her probability to participate in the labor force using a random effects logit estimation conditional on standard socio-economic determinants of participation. In this context, labor force participation is defined as a general availability for market productions and thus also includes non-employed women who are actively searching for a job. I find a significant positive relationship between having an internal LOC and being available to the labor market. A subgroup analysis reveals that, while a strong relationship can be observed for cohabiting women and women with (young) children, the effect for childless women is distinctly lower or even close to zero, depending on family status. This indicates a crucial heterogeneity with respect to underlying monetary incentives for working.

In a second step, I attempt to identify the underlying mechanism behind the identified positive relationship using indirect evidence from an additional heterogeneity analysis. Based on the assumption that traditional gender roles and social norms for working differ based on region of residence and birth cohort, those variables are used as proxies for exogenously given non-monetary incentives for participation. The heterogeneity analysis reveals that the effect is distinctly higher in West-Germany and for women in older cohorts. This supports the hypothesis that LOC is an important determinant of the weighting of non-monetary incentives for working.

The outline of the paper is as follows. Section 2 starts by giving a brief introduction into the basic underlying model of female labor supply and, based on this, introduces the theoretical idea of the paper and the proposed hypotheses for the empirical analysis. In the empirical part of the paper, Section 3 describes the data and the estimation strategy and Section 4 presents an overview of the results of the main estimation as well as the attempts to identify the driving channels behind the relationship. Section 5 summarizes a number of tests for robustness of the results. Section 6 concludes the paper.

## 2 Theoretical Considerations

### 2.1 The Traditional Model of Female Labor Supply

As the model supposed by Mincer (1962) is still the most prominent model on female labor force participation, the considerations and extensions made in this paper are guided by and incorporated into this baseline model. In this model, the labor income of the husband or partner is assumed to negatively affect female labor force participation by increasing the woman’s non-labor income. In line with Mincer (1962), this can be formalized as follows:

$$L_i = \gamma_1 w_i + \gamma_2 y + u \tag{1}$$

where  $L_i$  is the amount of labor supplied by woman  $i$  to the market and  $w_i$  is “market earnings power” of women  $i$ , i.e. her expected market income from a labor supply amount  $L_i$ .  $y$  is the total family income and  $u$  is a residual component capturing other factors such as taste.  $w_i$  captures only those earnings which are directly related to a positive labor supply of the woman, i.e. market income from dependent or independent work, and the first part of the equation thus summarizes what is known as the substitution effect with  $\gamma_1 > 0$ . On the other hand,  $y$  captures all components of the permanent family income, i.e. the market incomes of the woman  $w_i$  as well as the market wage of her partner  $w_p$  and all other sources of income  $x$ , such as transfer income and welfare benefits, property and capital income:  $y = w_i + w_p + x$ . The second part of the equation thus describes the traditional income effect with  $\gamma_2 < 0$ .

For simplicity and because existing evidence – e.g. by Kimmel and Kniesner (1998) – shows that the labor supply decision of married men and women mainly differs at the extensive margin, the theoretical considerations as well as the empirical analysis are concentrated on the decision making at the extensive margin:

$$\begin{aligned} LFP_i &= 1 \quad \text{if } L_i > 0 \\ P(LFP_i = 1) &= P(\gamma_1 w_i + \gamma_2 y + u > 0) \end{aligned} \tag{2}$$

where  $P(LFP_i = 1)$  is the latent probability of woman  $i$  to participate in the labor force (i.e. to supply a positive amount of labor  $L_i > 0$ ).

Additionally, the focus of this paper is to analyze the behavioral aspects of labor force participation, while leaving the demand side aside. This is done by concentrating on labor force availability as opposed to actual employment and thus reducing the risk of biased results due to omitted returns in employment probability in the empirical part. In line with the ILO definition of “labor force”, a woman is thus assumed to participate in the labor market if she is

either already employed or self-employed or if she is unemployed and intends to participate by indicating that she is searching for a job (see International Labour Organization, 2018). Thus,  $LFP_i$  also equals one if the woman does not work but is available to the market by searching for a job. In this simplification, given a certain expected market wage  $w_i$ , no assumptions on labor market conditions and frictions are necessary, as  $P(LFP_i = 1)$  only depends on the woman’s individual decision making processes and not her exogenous probability of finding a job, except indirectly through  $w_i$ . In line with this expansion, also transfer payments and welfare benefits which are paid in response to e.g. job-search efforts, such as unemployment insurance to woman  $i$ , are now captured by  $w_i$ . Thus,  $w_i$  can be labeled as the “earnings from participation” rather than the “market wage”. For a single woman ( $w_p = 0$ ) without any other external income sources ( $x = 0$ ), the participation decision thus only depends on her own earnings from participation:  $y = w_i$ . If we assume that she has to fulfill the second-order condition of meet her basic consumption needs, any woman has to generate a certain level of  $y$ . In the case of Germany, this woman will certainly participate in the labor market, as also basic welfare benefits are conditional on participation<sup>4</sup>. Based on the case of Germany, this considerations can be slightly softened for single mothers with young children. Those women have the opportunity of rest on welfare payments as long as their children are relatively young and unemployment insurance payments can thus be assumed to be independent from  $L_i$  as long as no other sources of income exist<sup>5</sup>.

**Additional Monetary and Non-Monetary Incentives for Labor Supply** Also the literature on additional monetary incentives as well as the newer literature on non-monetary incentives for working can easily be incorporated into the basic model by splitting up what was summarized by  $u$  in the traditional model.  $u$  is a vector of multiple possible influencing factors such as additional monetary incentives  $m$  (e.g. search costs, commuting costs, childcare costs, tax (dis)incentives, transfer withdrawal rates etc.), non-pecuniary incentives  $n$  (e.g. social purpose, economic identity, social networks etc.) and a remaining error term  $\nu$ :

$$u = \delta_1 m + \delta_2 n + \nu \tag{3}$$

This leaves us with the following participation equation

$$P(LFP_i = 1) = P(\gamma_1 w_i + \gamma_2 y + \delta_1 m + \delta_2 n + \nu > 0) \tag{4}$$

---

<sup>4</sup>Adults who receive social transfer payments in Germany are in general required to be available for every reasonable employment if they are employable (§7 SGB II). Unemployment insurance payments are thus directly bounded to an active job-search requirement.

<sup>5</sup>In German law, employment is, amongst others, not “reasonable” if this employment e.g. would endanger the upbringing of children. As is regulated in §10 SGB II this applies to children under the age of 3.

We know from the earlier literature that the wage elasticity  $\gamma_1$  and cross-wage elasticity  $\gamma_2$  of men are comparably low. If we assume that  $\delta_1 m$  does not strongly differ between men and women and wage differences  $w_i$  are moderate, large parts of gender differences in participation probabilities are thus captured by differences in  $\delta_2 n$ . Based on the already introduced literature on traditional gender roles and social identity, this is very likely to be driven by differences in the importance of social norms for working between men and women. The same might hold true for differences between single and partnered women, as for single women the social pressure of being independent from social transfers might be similarly high.

The remaining open question is, what drives differences in the labor force participation between women if monetary incentives for working and family status are held constant. In the neoclassical model of labor-leisure choice, this difference in preferences is represented by differences in the slope of the indifference curves. On the two extreme ends, some women have very flat indifference curves, i.e. they gain high marginal utility from every unit of work<sup>6</sup> and thus make their participation decision similarly to their male partners, i.e. in large parts independent from monetary incentives. As opposed to this, other women have relatively steep indifference curves, i.e. they gain relatively less marginal utility from every unit of work and relatively higher marginal utility from outside options such as leisure or home production. They thus strongly respond to monetary (dis)incentives for working such as the existence and level of their partner's earnings and other monetary disincentives for working, e.g. childcare costs. The participation gap between these two notional groups of women thus also remains if monetary incentives as well as the own expected earnings are held constant.

## 2.2 Personality Traits as Non-Standard Determinants of Participation

In order to explain parts of this heterogeneity of preferences, a woman's personality might play a crucial role. Personality traits are *“relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances.”* (Roberts, 2009) and are largely assumed to have a high potential to *“account for a substantial amount of variation in human behavior”* (Paunonen and Ashton, 2001). Thus, based on the simple participation model above, personality can be assumed to affect the participation decision via three main channels: (1) differences in the valuation of the components, i.e.  $\gamma_1$ ,  $\gamma_2$ ,  $\lambda_1$  and  $\lambda_2$ , (2) differences in the subjective expectations about  $w_i$  and  $y$  or (3) the realization of  $w_i$ , i.e. wage-returns to personality, and  $y$  (e.g. assortative mating).

This paper attempts to contribute to the literature by specifically considering the potential

---

<sup>6</sup>In addition to the simple model this utility might not only be attached to the value of consumption but also to other non-pecuniary benefits of working.



role of the personality trait locus of control in this context. Based on the definition by Rotter (1966), LOC is assumed to affect behavior – i.e. participation – mainly through expectations and motivation (see e.g. Cobb-Clark, 2015). Internal individuals can be assumed to have more positive subjective expectations about whether their own behavior will be followed by rewards in the future and at the same time to have a stronger motivation to keep the own life under control. Locus of control (*loc*) can thus be assumed to affect differences in the valuation of the non-pecuniary as opposed to pecuniary factors, i.e. the size of  $\lambda_2$ , the subjective expectations and objective realization of monetary returns to participation, i.e. the size of  $w_i$ , and the realization of family income, i.e. the size of  $y$ :

$$P(LFP_i = 1) = P(\gamma_1 w_i(\text{loc}) + \gamma_2 y(\text{loc}) + \lambda_1 m + \lambda_2(\text{loc})n + \nu > 0) \quad (5)$$

### 2.3 Derived Empirical Hypotheses

Based on the proposed channels (1) - (3) in the general considerations, multiple hypotheses can be formed about the relationship between locus of control and female labor force participation. Those hypotheses will then inform the empirical analysis in Section 3 and 4. The following section will give a detailed discussion of the possible hypotheses for the empirical analysis and additionally roughly describes how the hypotheses about different channels can be tested using survey data.

The first channel suggested that LOC might affect the importance of non-monetary incentives of working – i.e. social purpose and economic independence – through differences in the motivation to achieve a controlling influence over the own life’s outcomes. Nevertheless, two explanations for this relationship are possible and thus two competing hypotheses (H1.1) and (H1.2) can be constructed. Firstly, it can be argued that if individuals think that their own efforts determine their lives’ outcomes, they are very likely to be motivated to act according to it. They are thus expected to frame their lives such that they are as independent as possible from external forces, e.g. their partners or social transfers. As participating in the labor force is a highly important action in the context of economic and financial outcomes, internal individuals might be more likely to generate positive social purpose and economic identity from being active on the labor market conditional on all other important factors that determine the decision. Thus, women with an internal LOC are expected to derive more utility from the status of being employed, independent from all monetary incentives, as they perceive the positive effects on social status to be directly correlated with their own efforts:

H1.1) Internal women put a higher weight on non-monetary incentives for working and thus gain higher marginal utility from market production:  $\frac{\partial \lambda_2}{\partial \text{loc}} > 0$

Alternatively, it nevertheless might also be possible that women with a more internal LOC have stronger “internal” sources of social identity and are thus even more independent from their labor force status as an determinant of social purpose in the society. Social norms of working might be experienced as external forces on individual well-being and internal individuals might be more independent from those:

H1.2) Internal women put a higher weight on non-monetary disincentives for working and thus gain higher marginal utility from home production:  $\frac{\partial \lambda_2}{\partial loc} < 0$

The second proposed channel suggested that LOC might affect the subjective expectations about monetary returns to participation. The expected monetary returns to participation are higher for internal individuals as they believe in the direct causality between own efforts and life’s outcomes. Internal women might e.g. have higher subjective job-offer arrival rates (Caliendo *et al.*, 2015b), higher appreciation of future career costs of non-working (Berger and Haywood, 2016) and higher subjective wage rates in general:

H2) Internal woman expect higher earnings from participation and thus gain higher utility from availability for market production:  $\frac{\partial w_i}{\partial LOC} > 0$

In addition to those three main hypotheses, some other explanations are possible, although they are less prevailing and easier to control for. The difference between internal and external women might e.g. also be driven by differences in realizations of monetary incentives and disincentives for working. One potential explanation for this might be positive demand-side responses to an internal LOC, i.e. higher wages rates (see e.g. Heineck and Anger, 2010) which are anticipated by women and thus incorporated into the decision-making. Additionally, internal women have been found to select into occupations which are less open for flexible employment paths, i.e. leaving and returning to employment, such as science, engineering or related professions (Cobb-Clark and Tan, 2011). Those occupations are thus likely to be associated with higher future career costs of non-participation and thus higher disincentives for non-working through reduced future wages and employment probabilities:

H3.1) Internal women anticipate that they are able to realize higher wages in the present and the future and thus gain higher utility from market production:  $\frac{\partial w_i}{\partial LOC} > 0$

Alternatively, LOC might also be correlated with the partners’ earnings driven by assortative mating or mating probabilities in general. Internal women might e.g. tend to marry men with higher or lower earnings or might even tend to be less likely to marry at all, which would

again affect their own participation probabilities. Assortative mating might additionally also be important with respect to the personality of the partner. Women with an internal LOC might be more likely to mate with men with an internal LOC, which again indirectly influence women’s participation decisions through partners earnings:

H3.2) Internal women differ with respect to their available family income and thus have a higher or lower necessity to work in order to achieve their desired consumption level:  $\frac{\partial y}{\partial LOC} \neq 0$

**Channel Identification** Both hypotheses of channel (3) can be precluded in the empirical analysis by controlling for the respective intermediating variables. (H3.1) can be ruled out by controlling for the last labor net income of the woman as a proxy for the expected wage as well as for occupational characteristics (industry and occupational type) in the last observed employment. (H3.2) can be ruled out by controlling for partners earnings and personality<sup>7</sup>. All of this is done in the empirical analysis in Section 4.

As hypotheses (H1.1) and (H1.2) point into opposite directions, empirically disentangling those two competing channels will also be straightforward. If we can identify a positive relationship between LOC and participation probabilities, H1 is likely to be the more dominant causal explanation and vice versa.

Nevertheless, empirically distinguishing hypothesis (H2) from hypotheses (H1.1) is less straightforward. Identifying whether a positive effect of LOC on participation probabilities operates through  $\lambda_2$  or through  $w_i$  would require either measures about the individual importance of non-monetary incentives for working or measures of subjective expectations about monetary returns from participation such as job-offer arrival rates. Nevertheless, both are not available in the data. In order to nevertheless, at least indirectly, identify the underlying channel, variation in the non-monetary incentives for working  $n$  can be used. This is based on the assumption that if the non-monetary incentives for working are very high, even women who tend to give them lower weight might nevertheless have a high probability to participate. This is in line with the idea that e.g. for men the social norms for working are expected to be very high and we would thus not expect a strong effect of LOC on participation probabilities through this channel for them. Already Rotter (1966) nicely summarized this by stating that *“the more clearly and uniformly a situation is labeled as skill or luck determined, in a given culture, the lesser the role [locus of control] would play in determining individual differences in behavior”*. The stronger the social norms for working, e.g. through more modern gender roles, the lower is the expected effect of

---

<sup>7</sup>Remaining concerns about various other possible interdependencies between partners such as with respect to gender attitudes cannot be perfectly ruled out. Internal women might e.g. be more likely to mate with men who have more tolerant gender attitudes and are thus more likely to participate. Those characteristics have to be assumed to be largely captured by the partner’s locus of control and earnings.

LOC for the affected woman. The heterogeneity of social norms and gender roles is nevertheless not expected to affect the subjective expectations about monetary returns to participation. If a heterogeneity of the effects can be identified, this points into the direction of channel (1) while homogeneity would favor channel (2). In the empirical analysis, cohort and region of living are used as proxies for differences in prevailing traditional gender roles and social norms for working in order to distinguish the channels. Based on the continuous decrease in the importance of traditional gender roles and family labor division patterns over time in almost all modern western societies (see e.g. Costa, 2000; Goldin, 2006; Ross *et al.*, 1983), women in younger cohorts are assumed to be more affected by a generalized social pressure to work than women of older cohorts. For them,  $n$  can be assumed to be higher, i.e. closer to their male counterparts. They might thus have a higher participation probability that is more independent from LOC. A similar heterogeneity can be expected with respect to differences between the eastern and western parts of Germany. Due to the long-term socialist political influence in the former GDR, East Germany has a longer tradition of women's participation in the labor force.<sup>8</sup> Non-monetary incentives  $n$  might thus also be heterogeneous with respect to region of living, i.e.  $n$  is higher for East-German women. The absolute effect of LOC on participation probabilities might thus be lower in East Germany.

**Subgroup-specific Hypotheses** Independent from the underlying channels of the effect, the influence of LOC on participation crucially depends on the overall size of incentives for market- and home production. If monetary and/or non-monetary incentives for market- or home production are very high, the power of LOC to affect participation probabilities might be comparably low. Thus, the estimated effects are expected to be highly heterogeneous with respect to the existence of partners and children in the household as they crucially determine the size of  $y$ ,  $m$  and  $n$ . Based on this considerations, all effects are estimated for different sub-groups of women, depending on their family status<sup>9</sup> as well as existence and age of children.

As was already stated above, the monetary incentives for working of a non-cohabiting, childless woman are very high in the given context. As this considerably reduces her free choice between market- and home production, the power of *loc* to affect  $P(LFP_i = 1)$  is expected to be very low. Nevertheless, based on the prevailing legal regulation the effect for non-cohabited woman is expected to be highly heterogeneous with respect to the existence of young children.

---

<sup>8</sup>The socialist system was characterized by a strong emphasis on the dual-earner/state-carer system of family labor supply, i.e. a extremely high levels of female labor force participation in combination with an extensive system-level organization of family-support structures and child care (see e.g. Braun *et al.*, 1994; Rosenfeld *et al.*, 2004).

<sup>9</sup>Family status in this context denotes the presence of a partner in the household, independent from the marital status of the woman. Women are thus distinguished into non-cohabiting (single or partner outside the household) and cohabiting women (partner or husband in the household).

As non-cohabited women with young children have lower monetary incentives for working, they do have the opportunity to choose home production and for them an effect of LOC might be observable. Concerning monetary incentives, the opposite case is true for women (independent from the family status) with very young children, due to generous parental leave payments in Germany. Thus, women with children under the age of one might have very high monetary incentives for home production and LOC has no strong effect on their participation probabilities.

Also for cohabited woman, i.e. women with moderate monetary incentives for market production<sup>10</sup>, the existence of children might interact the effect of LOC. This is because the presence of children is likely to importantly increase the non-monetary utility from home production. If no children are present in the household, the utility from home production might be too low and home production might thus be a less attractive outside option from market production. LOC is thus expected to affect the participation probabilities of women with (non-adult) children more strongly. On the other hand, the existence of (young) children might also lead to very high non-monetary incentives for home-production depending on a woman's parenting preferences and the quality of childcare options and thus again reduce the power of LOC. Even more dramatically for the estimated relationship, internal mothers might even consider the effect of their own actions on their children more thoroughly than external mothers. If a mother assumes that her efforts in child-rearing might have important positive effects on their children's outcomes, they might also be more likely to stay at home with young children as opposed to giving them into childcare. This could also mean that for mothers with certain parenting preferences, a potential generally positive effect of LOC on the participation probability is compensated or, in line with the direction of (H1.2), the effect might even be negative.

### 3 Data and Empirical Identification

Based on those theoretical considerations, the goal of this paper is to empirically analyze the role of locus of control in explaining a women's current labor force participation while additionally investigating the potential driving channel(s) behind it. This is done by using data from the German Socio-Economic Panel (SOEP, 2017). The SOEP is an annual representative household panel that follows a general-purpose approach. It studies about 22,000 individuals living in 12,000 households in Germany since 1984. Personal questionnaires are completed by all individuals aged 18 or older (Wagner *et al.*, 2007). It contains a measurement of locus of control over multiple waves, rich information on current labor-market outcomes and family status as well as the opportunity to connect women to their partners' characteristics if they are surveyed in the same

---

<sup>10</sup>Childcare costs in Germany are relatively low and thus not expected to strongly influence participation decisions.

Table 1: Descriptive Statistics - Labor Force Status (shares in %)

	(1)	(2)	(3)	(4)
	All	Children under 16	Non-Cohabiting	Cohabiting
Labor Force Status				
Employed	0.70	0.63	0.76	0.69
Full-Time ( $\geq 35$ hours)	0.54	0.35	0.68	0.49
Part-Time ( $< 35$ hours)	0.46	0.65	0.32	0.51
Self-Employed	0.07	0.07	0.12	0.05
Unemployed	0.06	0.06	0.07	0.06
Not-Working	0.13	0.15	0.04	0.16
Maternity Leave	0.04	0.10	0.01	0.04
Labor Force Participation	0.82	0.74	0.92	0.79
Observations	65453	24869	13337	52116
Individuals	9384	4234	2858	7780

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Note: Full descriptive statistics can be found in Table A.1 in the Appendix.

household. The data is restricted to the waves 2000-2016 due to the measurement of locus of control.

**Sample Restriction** For the sample restriction process, I only keep women in the traditional working age, which is defined as 25 to 65 years. As another restriction, all women who are still in school, academic or vocational education, already in (early) retirement, in military service or in other unknown labor force statuses are dropped. Additionally, only women are kept for which I am able to observe all relevant socio-economic control variables. This leaves me with 65,453 observations for 9,384 women over 16 years in the full sample of all women.

Tables 1 and A.1 give an overview over the descriptive statistics of the full sample (column 1). In addition to the full sample of all women, the descriptive statistics are also reported for three (non-exclusive) subsamples: (1) all women with biological children under 16<sup>11</sup> (2) non-cohabiting women, i.e. single women or women with a partner outside their household, and (3) cohabiting women, i.e. married women or women with a partner in the same household.

### 3.1 Labor Force Participation

Labor force participation (LFP) is measured as a binary indicator that indicates a woman's availability to the labor market. The focus of this paper is to analyze the behavioral aspects of labor supply. Thus, labor force participation does not describe a woman's true labor force status but her willingness to participate in market production. Concentrating on the availability to the job market rather than on the actual employment status, allows me to theoretically and empirically neglect the demand side and reduce the risk of selection effects via differences in

<sup>11</sup>The sample includes all women independent from their family status. The information on the children is generated based on the individual birth history of the woman available from the SOEP. The sample thus includes all women who have children under the age of 16 (independent from whether they live in the same HH).

employment probabilities.

In line with the ILO definition of labor force participation, a woman is counted as being in the labor force if she is either employed or self-employed or if she is registered unemployed or non-working (not registered unemployed) but intends to work and is searching for a job (see International Labour Organization, 2018)<sup>12</sup>. The robustness of the results with respect to the definition of the dependent variable is tested in a sensitivity check in Section 5. Table 1 gives an overview over the current labor force status of the women. In the full sample of all women (column (1)), 70% are employed, 7% are self-employed, 6% are unemployed and 13% indicate that they are not working. If, in addition to this raw shares, also the information on active job search is considered, this results in a labor force participation rate of 82%. Due to a lower share of employed women and a higher share of women who indicate that they are not working in the subsample of cohabiting women as compared to the non-cohabiting women, the labor force participation is distinctively lower for those women (79% compared to 93%).

### 3.2 Locus of Control

In 1999, 2005, 2010 and 2015, respondents were asked how closely a series of 10 statements characterizes their views about the extent to which they influence what happens in life. A four-point Likert scale ranging from 1 ('applies fully') to 4 ('does not apply') was used in 1999, while in 2005, 2010 and 2015 responses were measured on a seven-point Likert scale ranging from 1 ('disagree completely') to 7 ('agree completely'). A list of the items can be found in Table 2.

In order to harmonize the scales, responses from 1999 are reversed and "stretched".<sup>13</sup> Afterwards, I conduct an explanatory factor analysis separately by year in order to investigate the way these items load onto latent factors.<sup>14</sup> Items 1 and 6 clearly load onto the first factor – which is interpreted as internal LOC –, while items 2, 3, 5, 7, 8 and 10 clearly load onto the second factor – interpreted as external LOC. Item 4 and 9 are not included in the following due to ambiguous loadings<sup>15</sup>.

Consistent with the previous literature (see e.g. Piatek and Pinger, 2016), I use a two-step procedure to create a continuous and unidimensional LOC variable. First, I reverse the scores

---

<sup>12</sup>Registered unemployed and non-working women are recoded based on the information available on intention to work, active search and ability to start working from the personal questionnaire. Registered unemployed women, who indicate that they were not actively searching for work in the last 4 weeks, are coded to "not participating" while a woman, who was originally coded as "not working" but indicates that she actively searched for a job, has the unconstrained intention to work and is ready to immediately start working is coded to "participating".

<sup>13</sup>This process preserves the standard deviation, but allows for changes in the mean. The process results in values of 1, 3, 5 or 7 so that a '1' on the 1999 four-point scale, for example, becomes a '7' on the 2005-2015 seven-point scales.

<sup>14</sup>The detailed results from the factor analysis are available upon request. A loading plot pooled for all years can be found in Figure A.1 in the appendix but the pattern of factor loadings is similar in all years.

<sup>15</sup>Items 4 does not clearly load onto both factors and is discarded. Item 9 loads onto the internal factor but an intuitive attribution based on the items wording would point more into the direction of an external item.

Table 2: Components of Locus of Control in SOEP (not imputed)

No	Item	mean	SD
<b>Q:</b>	The following statements apply to different attitudes towards life and the future. To what degree do you personally agree with the following statements? <i>Scale: 1 (Disagree completely) - 7 (Agree completely)</i>		
I1:	How my life goes depends on me	5.46	(1.30)
I2:	Compared to other people, I have not achieved what I deserve (R)	3.16	(1.74)
I3:	What a person achieves in life is above all a question of fate or luck (R)	3.54	(1.64)
I4:	If a person is socially or politically active, he/she can have an effect on social conditions	3.67	(1.58)
I5:	I frequently have the experience that other people have a controlling influence over my life (R)	3.10	(1.65)
I6:	One has to work hard in order to succeed	5.90	(1.16)
I7:	If I run up against difficulties in life, I often doubt my own abilities (R)	3.45	(1.65)
I8:	The opportunities that I have in life are determined by the social conditions (R)	4.53	(1.42)
I9:	Inborn abilities are more important than any efforts one can make	4.79	(1.31)
I10:	I have little control over the things that happen in my life (R)	2.65	(1.47)
	Observations	18149 <sup>a</sup>	

Source: SOEP, waves 1999, 2005, 2010 and 2015, version 33.

Notes: Items marked with a (R) are reversed prior to factor analysis.

<sup>a</sup> In this table, the item means and SD are computed for observation waves only.

for items 2, 3, 5, 7, 8 and 10 such that all eight items are increasing in internality<sup>16</sup>. Second, for each year, I use factor analysis to extract a single factor. This has the advantage that it avoids simply weighting each item equally, as averaging would do, and instead allows the data to drive how each item is weighted in the overall index. Simple averaging risks measurement error and attenuation bias (Piatek and Pinger, 2016). The resulting factor is increasing in internal LOC and its distribution is shown in Figure 1.

There is evidence that LOC is relatively stable for the working-age population (see e.g. Preuss and Hennecke, 2018; Cobb-Clark and Schurer, 2013). Nevertheless, in order to minimize concerns about potential reverse causality, I ensure that the LOC factor is always measured prior to the period in which I observe the labor force participation. That is, LFP in 2000 - 2005 depends on 1999 locus of control, LFP in 2006 - 2009 depends on 2005 locus of control, and LFP in 2010 - 2014 depends on 2010 locus of control.<sup>17</sup>

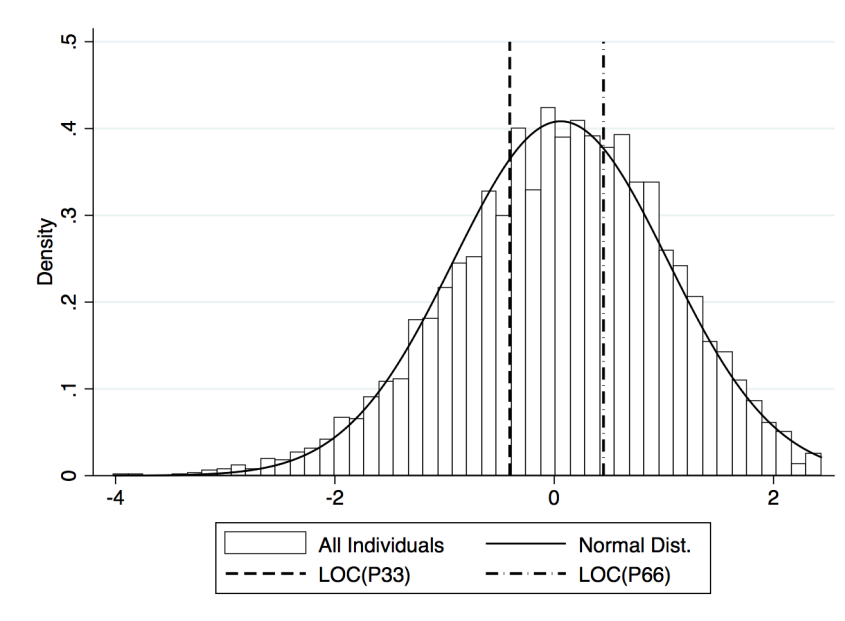
Based on the generated and imputed continuous LOC factor variable, I create a categorical variable that splits the continuous LOC in three tertiles, in order to identify non-linear relationships. These cutoffs are also illustrated in Figure 1.

<sup>16</sup>Those items are marked with an (R) in Table 2.

<sup>17</sup>Based on the findings in Preuss and Hennecke (2018), this procedure does not prevent a bias due to a temporary measurement error in LOC during periods of (registered and unregistered) unemployment. In line with what is proposed in Preuss and Hennecke (2018), I thus additionally attempt to correct the LOC measurement by using the LOC which has been observed during the closest employment spell of those women. The results of those estimations are presented and discussed in Section 5.



Figure 1: Distribution of Locus of Control



Source: SOEP, waves 1999, 2005, 2010 and 2015, version 33, own illustration.

Table 3: Descriptive Statistics by LOC - Labor Force Status (shares in %)

	$[LOC_{min}, LOC_{P33}]$	$(LOC_{P33}, LOC_{P66}]$	$(LOC_{P66}, LOC_{max}]$
<b>Labor Force Status</b>			
Employed	0.67	0.72	0.72
Full-Time Employed	0.53	0.53	0.55
Part-Time Employed	0.47	0.47	0.45
Self-Employed	0.10	0.06	0.04
Unemployed	0.04	0.06	0.08
Not-Working	0.16	0.12	0.11
Maternity Leave	0.03	0.04	0.04
Labor Force Participation	0.79	0.83	0.84
Observations	21342	21632	22479

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

### 3.3 Locus of Control and Labor Force Participation

Table 3 gives first descriptive evidence for the relationship between LOC and labor force status and participation of the women in the sample. The shares of all labor force statuses as well as the dependent variable labor force participation are given separately for all three tertiles of LOC. It can be seen that due to a higher share of employed, self-employed and unemployed and a lower share of non-working women for the highest tertile, the overall share of labor force participation is higher for women with a higher LOC compared to a low LOC. Nevertheless, this descriptive relationship is very likely to be driven by a long list of socio-demographic characteristics that are associated with a higher participation probability and a higher LOC such as education, age and family status (e.g. number and age of children).

### 3.4 Estimation Strategy

For the main empirical analysis, I employ a reduced-form approach to estimate the association between a woman’s propensity to be available to the labor force and her last LOC:

$$P(LFP_{it} = 1) = P(\beta_1 + \beta_2 loc_{it-1} + \beta_3 X_{it} + \beta_4 T + \epsilon_{it} > 0) \quad (6)$$

where  $LFP_{it}$  is the indicator for labor force participation of woman  $i$  at time  $t$  and  $loc_{it-1}$  is the locus of control of woman  $i$  in the last LOC interview prior to  $t$ . In order to identify potential non-linearities in the relationship, in addition to the continuous variable  $loc_{it-1}$ , the LOC is alternatively also included as a categorical variable that indicates in which tertile of the LOC distribution a woman is classified. The vector  $X_{it}$  contains an extensive list of demographic information (age, religion, region of residence, school and vocational degree, subjective health), family characteristics (partner status, number of children, indicators for children in certain age ranges) as well as averaged and standardized personality and preferences measures (Big Five personality traits and risk aversion)<sup>18</sup>. See Table A.1 for the full list of controls. Additionally, the vector  $T$  contains year fixed effects.

Equation 6 is estimated using a random effects logit model. The use of random effects is necessary here as it considers the panel structure of the data and takes care of serial correlation of the error term  $\epsilon_{it}$  across time for a given individual  $i$ . The results presented in Section 4 are average marginal effects on the probability of a positive outcome assuming that the random effect is zero. In order to assess the sensitivity of the results with respect to the method choice, I additionally estimate the main results using a simple logit with clustered standard errors as well as a random effects estimation in a case which assumes a linear probability model. The results are presented in the sensitivity checks in Section 5.

As already discussed in the theoretical considerations, the estimated direct relationship is very likely to be non-linear with respect to monetary and non-monetary incentives as important interaction terms. This is why, based on the simple baseline estimation as presented in equation 6, in a second step, heterogeneity with respect to the family status (i.e. existence of a partner and children in the household as well as age of the children), as a major indicator for differences in the monetary incentives for working is considered. As not only  $\beta_2$ , i.e. the marginal effect of  $loc$ , is considered to be non-linear with respect to the family status, and because family status is going to be considered with multiple, non-exclusive subgroups, the heterogeneity is considered

---

<sup>18</sup>In a sensitivity check in Section 5, I additionally investigate the role of characteristics of the employment type in the current or last employment spell in order to assess the importance of selection into certain industries or occupational types. Nevertheless, those variables are assumed to be “bad controls” in the estimation due to the high risk of endogeneity of those variables in the model (see Angrist and Pischke, 2008, for more information). See a more detailed discussion of the problem in Section 5.

using fully separated models for the different subgroups conditional on a woman’s family status  $FS_{it}$ :

$$P(LFP_{it} = 1|FS_{it}) = P(\beta_1 + \beta_2 loc_{it-1} + \beta_3 X_{it} + \beta_4 T + \epsilon_{it} > 0|FS_{it}) \quad (7)$$

In a third step, proxies for differences in the non-monetary incentives for working, i.e. region of living and cohort indicators, are included as interaction terms into the estimation equation in order to identify heterogeneity of the marginal effect of  $loc$  driven by differences in the underlying non-monetary incentives for working:

$$P(LFP_{it} = 1) = P(\beta_1 + \beta_2 loc_{it-1} \times n_{it} + \beta_3 X_{it} + \beta_4 T + \epsilon_{it} > 0) \quad (8)$$

with  $n_{it}$  being a vector of proxies for differences in non-monetary incentives for working, i.e. region of living and birth cohort, as discusses in the theoretical considerations. Following the random effects logit estimation, which includes this vector in the estimation equation, average marginal effects are computed separately over the different manifestations of  $n$ , i.e. East and West for the region of living indicator and “old” (born before 1958), “middle-age” (born between 1958 and 1966) and “young” (born after 1966) for the birth cohort indicator<sup>19</sup>.

## 4 Results

### 4.1 Main Results

Table 4 gives an overview over the estimated average marginal effects of the continuous LOC variable as well as the LOC categories medium ( $(LOC_{P33}, LOC_{P66}]$ ) and high ( $(LOC_{P66}, LOC_{max}]$ ) on labor force participation, with a low LOC ( $[LOC_{min}, LOC_{P33})$ ) being the reference category. All estimations are for the full estimation samples of all women, when gradually including more and more sets of control variables. In addition, column (1) of Table A.2 in the Appendix gives an overview over the estimated marginal effects for all control variables analog to the estimation using the categorical LOC variable (i.e. columns (8) in Table 4).

The results of the raw difference, only controlled for year fixed-effects, indicate that, on average, women with a high or medium LOC are *ceteris paribus* more likely to participate in the labor force (see column (2) of Table 4). Also, the continuous LOC factor is significantly positive, indicating an increasing probability of participation with increasing values of LOC. Including additional control variables indicates that the raw gap was biased downwards by

---

<sup>19</sup>The cutoffs for the manifestations of the birth cohort indicator “old”, “mid-age” and “young” were generated based on the tertiles of year of birth in the full estimation sample, i.e.  $P(33) = 1958$  and  $P(66) = 1966$ , in order to obtain groups of approximately similar size.

Table 4: Main Results - Average Marginal Effects (Sample: All Women)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LOC Factor (cont.)	0.005*** (0.001)		0.005*** (0.001)		0.008*** (0.001)		0.007*** (0.001)	
Locus of Control Terciles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])								
( $LOC_{P33}$ , $LOC_{P66}$ )		0.009*** (0.002)		0.010*** (0.003)		0.014*** (0.003)		0.013*** (0.003)
( $LOC_{P66}$ , $LOC_{max}$ )		0.009*** (0.002)		0.008*** (0.003)		0.015*** (0.003)		0.012*** (0.003)
Observations	65453	65453	65453	65453	65453	65453	65453	65453
Year Fixed-Effects	✓	✓	✓	✓	✓	✓	✓	✓
Socio-Demographics	✗	✗	✓	✓	✓	✓	✓	✓
Family Controls	✗	✗	✗	✗	✓	✓	✓	✓
Personality Controls	✗	✗	✗	✗	✗	✗	✓	✓

Source: SOEP waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

omitted variable bias especially through family characteristics such as partner status, number of children and age of children. The average marginal effect is still significantly positive for the estimation using the full specification (columns (7) and (8)). Having a medium or a high LOC increases the probability to be in the labor force by, on average, 1.3 and 1.2 percentage points compared to having a low LOC. When comparing this effect to the mean non-participation rate in the full sample of 13 percent (see Table 1), this amounts to a 10 percent decrease in the probability to stay at home. Increasing the LOC by approximately 1 standard deviation, increases the probability of participation by 0.7 percentage points.

When comparing the marginal effects of a medium and a high LOC, a non-linearity in the effect of LOC on the participation probability becomes apparent. While a medium LOC is associated with an increased probability of participation, this effect flattens out afterwards. Women with a very high LOC are not significantly more likely to participate than women with a medium LOC. In line with the one-dimensionality of the LOC scale, the findings indicate that the effect is mainly driven by a negative impact of being strongly external, rather than a positive impact of being strongly internal. While a negative effect of LOC on participation probabilities in line with (H1.2) can in general be rejected, the considerations about “independence from social norms as external forces” might nevertheless be valid especially for women with a very high LOC, counteracting the effects proposed in (H1.1) and (H2).

**Subgroup Analysis - Family Status and Children** Based on these main results for the full sample, Tables 5 and 6 present the results for the sub-samples based on family status and existence of biological children under the age of 16. All estimations include the full specification and, for comparison, columns (1) and (2) of Table 5 give the results for the full sample (equivalent

Table 5: Heterogeneity Analysis: Family Status

	All		Non-Cohabiting		Cohabiting	
	(1)	(2)	(3)	(4)	(5)	(6)
LOC Factor (cont.)	0.007*** (0.001)		0.003*** (0.001)		0.007*** (0.002)	
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])						
( $LOC_{P33}$ , $LOC_{P66}$ )		0.013*** (0.003)		0.004 (0.003)		0.015*** (0.004)
( $LOC_{P66}$ , $LOC_{max}$ )		0.012*** (0.003)		0.005* (0.003)		0.013*** (0.004)
Observations	65453	65453	13337	13337	52116	52116
Year Fixed-Effects	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: Heterogeneity Analysis: Children

	No Children			Children under 16		
	All	N.Cohab.	Cohab.	All	N.Cohab.	Cohab.
	(1)	(2)	(3)	(4)	(5)	(6)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])						
( $LOC_{P33}$ , $LOC_{P66}$ )	0.007*** (0.002)	-0.000 (0.002)	0.010*** (0.003)	0.022*** (0.007)	0.023* (0.013)	0.018** (0.008)
( $LOC_{P66}$ , $LOC_{max}$ )	0.007*** (0.002)	0.001 (0.002)	0.010*** (0.003)	0.021*** (0.007)	0.028** (0.013)	0.016** (0.008)
Observations	40584	10058	30526	24869	3279	21590
Year Fixed-Effects	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

to columns (7) and (8) in Table 4).<sup>20</sup> Those subgroup analyses correspond to the supposed interaction of the effect of LOC on participation probabilities with underlying monetary and non-monetary incentives and disincentives for working driven by the existence of partners and children in the household.

By looking at the estimated average marginal effects for the separate groups, we can see that the effect is in large parts driven by cohabiting women and women with children under 16 in general. Cohabiting women with a medium LOC are, on average, c.p. 1.5 percentage points more likely to be in the labor force than cohabiting women with a low LOC, while a high LOC increases the probability to be in the labor force by 1.3 percentage points. For non-cohabiting women, the effect is close to zero and only slightly significant for women with a high LOC<sup>21</sup>. Nevertheless, separating the two groups by the children-indicator in Table 6 shows that this

<sup>20</sup>In addition, Table A.2 in the Appendix gives an overview over the estimated marginal effects for all control variables analog to the estimation using the categorical LOC variable in the full specifications.

<sup>21</sup>Similar insignificant close-to-zero effects can be found for men using the same sample specifications. Results can be obtained from the author upon request.

difference is in large parts driven by the existence of children in both groups. In the sub-group of women with children under 16, the effect for non-cohabiting women (i.e. single mothers) is even higher than the effect for cohabiting women. Single mothers with a medium LOC are, on average, c.p. 2.3 percentage points more likely to be in the labor force than single mothers with a low LOC, while a high LOC increases the probability to be in the labor force by 2.8 percentage points. In the sub-sample of women without children, the effect is still positive and significant for cohabiting women but zero for non-cohabiting women. Table A.3 in the Appendix additionally gives an analog estimation result for women with very young children, i.e. under 7, as well as women with “adult” children, i.e. children 16 years or older. The presented marginal effects by these subgroups indicate that the effect is strongest for women with young children. Although based on a relatively small sample size, the effect is extremely high for non-cohabiting women with children under 7. For them, having a high LOC increases the probability to be available to the labor force by 9.2 percentage points. Nevertheless, the effect for cohabiting women with “adult” children is still significant and positive.

All those results support the theoretical idea that the effect of LOC on participation probabilities strongly interacts with underlying incentives and disincentives for working. If the monetary incentives for market production – such as for single woman without children – already considerably exceed the decision threshold, personality and preferences have no power of affecting the participation decision.<sup>22</sup> Also in line with the theoretical considerations, non-monetary disincentives for working of some extent, e.g. through the social purpose the existence of (young) children adds to home production, impose the necessary scope of decision-making, which is important for LOC to change the decision-making towards working. Independent from monetary incentives, only women who at least consider home production as an outside option to market production, are assumed to be affected by their LOC. If no (non-adult) children are present in the household, the utility from home production seems to be too low and home production thus is a less attractive outside option from market production – such as for cohabited women without children or with adult children. Evaluating the theoretical ideas on the consequences of very high non-monetary incentives for home production – e.g. through the importance of care provided by the mother as opposed to outside-household childcare – is less straightforward as it is highly heterogeneous with respect to individual preferences about childcare as well as quality of alternative childcare options. The theoretical idea that an internal LOC might be associated

---

<sup>22</sup>As a test for the effect of very high monetary disincentives for working, an alternative heterogeneity check was conducted, which reduced the sample to women with children under the age of one, i.e. women who are largely eligible for generous parental leave payments. The estimated effects are insignificant and close to zero and thus support the idea that very high monetary disincentives for working act in the same direction as high incentives for working, i.e. reduce the power of LOC. The results can be obtained from the author upon request.

Table 7: Heterogeneity Analysis: Region of Residence

	All (1)	Cohabiting (2)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])		
( $LOC_{P33}$ , $LOC_{P66}$ ) × West	0.014*** (0.004)	0.017*** (0.005)
× East	0.007*** (0.003)	0.008*** (0.003)
( $LOC_{P66}$ , $LOC_{max}$ ) × West	0.015*** (0.004)	0.015*** (0.005)
× East	0.005 (0.003)	0.006* (0.004)
Observations	65453	52116
Year Fixed-Effects	✓	✓
Family Controls	✓	✓
Socio-Demographic Controls	✓	✓
Personality Controls	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

with a lower participation probability for mothers, due to considerations about their own influence on children’s outcomes, cannot be found in the data. The effect of LOC on participation probabilities is robustly positive over all considered sub-groups and the identified non-linearities are largely similar for women with and without children.

## 4.2 Channel Identification

Based on the main estimation, multiple alternative channels for the estimated relationship remain possible. It is thus the goal of this second part of the empirical analysis to indirectly narrow down the important channels. In a first step, the two main competing hypotheses (H1.1) and (H2) are isolated using the proposed heterogeneity analysis. In a second step, a number of potential intermediating variables, such as occupational choice, wage-responses and assortative mating, are included as control variables in order to largely neglect the alternative channels (H3.1) and (H3.2).

**Heterogeneity of Social Norms and Gender Roles** Tables 7 and 8 present the marginal effects based on the estimations in which LOC is interacted with region of residence and cohort as indicators for differences in prevailing traditional gender roles and social norms for working as proxies for different non-monetary incentives for working. The marginal effects are calculated over the region and cohort categories ( $n$ ), i.e. separate sets of margins are estimated at unique values of  $n$ . Thus, the reference group always is women with a low LOC in the particular group.

Table 7 reveals that the significant positive marginal effect of a medium and a high LOC is distinctively larger for women in West-Germany both in the full sample (column 1) as well as in the sub-sample of cohabited women (column 2). The effect of a high LOC is not significantly

Table 8: Heterogeneity Analysis: Cohort

	All (1)	Cohabiting (2)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])		
( $LOC_{P33}$ , $LOC_{P66}$ ) × Old*	0.039*** (0.008)	0.052*** (0.009)
× Mid-Age*	0.008** (0.003)	0.009** (0.004)
× Young*	0.001 (0.006)	-0.005 (0.008)
( $LOC_{P66}$ , $LOC_{max}$ ) × Old*	0.038*** (0.008)	0.055*** (0.010)
× Mid-Age*	0.005 (0.004)	0.005 (0.004)
× Young*	0.004 (0.007)	-0.001 (0.009)
Observations	65453	52116
Year Fixed-Effects	✓	✓
Family Controls**	✓	✓
Socio-Demographic Controls**	✓	✓
Personality Controls	✓	✓

Source: Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

\* Cutoffs: Old - born before 1958, Mid-Age - born 1958-1966, Young - born after 1966.

\*\* The list of control variables was slightly adjusted. Age is included as a continuous variable and only an indicator for children under 16 is included.

different from zero for women in East-Germany in the full sample. Additionally, the results presented in Table 8 indicate a strong heterogeneity of the effect with respect to cohort. The strong marginal effects of a medium and high LOC on participation probabilities can only be observed for women from older cohorts, i.e. born before 1958. For women in mid-age cohorts (born between 1958 and 1966) the effect is distinctly lower and only significantly different from zero for a medium LOC. For women in the youngest cohort (born after 1966) no significant marginal effects can be identified.

This is in line with the theoretical idea that the relationship between LOC and labor force participation is expected to be more pronounced for women in older cohorts and in West Germany. This is based on the assumption that for women of younger cohorts and women in East Germany, the generalized social pressure to work is higher and the non-monetary incentives for working are thus already considerably high. The effect of the component  $n$  in the labor supply equation might thus be very high for all women in those regions and age groups, making an influence of the LOC redundant. For those women, the labor supply equation at the extensive margin might equal that of men more strongly. This heterogeneity at the same time gives clear indirect indication in favor of hypothesis (H1.1) being the driving channel behind the estimated relationship, as e.g. an effect of LOC on participation probabilities via differences in the subjective returns to job-search and working (H2) is assumed to be largely homogeneous with respect to region of living and cohort.



As an additional validation for (H1.1), also the correlation of locus of control with a measure of the relative importance of monetary incentives for working, which is available for a subset of SOEP-respondents on an irregular basis, can be analyzed. Non-employed individuals are asked to indicate their main reason for working, i.e. earning money as compared to other reasons. In line with the expectations, women with a high internal LOC are significantly more likely to indicate that, for them, working also has other reasons besides earning money<sup>23</sup>.

**Occupational Choice** In line with the proposition in (H3.1), it might be interesting to investigate how much the estimated effects are driven by omitted information on the industry and occupational type of women in their current or last occupation as measures of occupational selection based on locus of control. Nevertheless, controlling for those characteristics is less straightforward than expected. Simply including the information from the current or last occupation would leave me with a large endogeneity problem caused by not necessarily the characteristics itself but by the availability of the information in general. The information on employment have to be imputed from the last employment or self-employment spell if a woman is not (self-)employed at the moment. Nevertheless, I am not able to observe any information on employment for a lot of women if they were either never employed or at least never employed during their time in the SOEP<sup>24</sup>. This is, by definition, more often the case in the group of women who do not participate in the labor force at the moment. When controlling for the employment information, the indicator for non-availability of the information would thus be a “bad control” in line with the arguments by Angrist and Pischke (2008), as it is highly multi-collinear with the labor force participation indicator. External women are not only more likely to be observed outside the labor force at the moment but also, they are more likely to never be observed in the labor force and the indicator could just as well be a dependent variable in the estimation model. Table A.4 in the Appendix presents the results for the main specification when including the information on the (last) occupational type and the (last) industry. To disentangle the endogeneity problem from the true effects of controlling for occupational characteristics, column (2) and (4) start by reducing the observation sample to those women for which I am able to observe any information on occupational type or industry. In line with expectations, the estimated effects for the LOC drop if the sample is reduced, indicating an endogeneity problem in the observability of information. Nevertheless, if I then include the last occupational type as well as the last industry classification, the estimated effects for LOC do not change significantly. This can thus be

---

<sup>23</sup>The results of the estimation can be obtained from the author upon request.

<sup>24</sup>The problem can be slightly weakened by using information on the very first employment of a women given in the biography questionnaire, which is answered by every SOEP-respondent. If no information on occupational type or industry are available during the time in in the SOEP, those information are used.

taken as an indication for no severe bias through omitted occupational information in the main estimations. An effect of LOC on participation probabilities via occupational selection and thus differences in the expected future costs of non-participation (H.3.1) can thus be rejected.

**Expected Wage Differences** As another important intermediating variable, the expected wage from working has to be discussed in detail. In order to investigate the importance of this channel, a proxy for the expected wage from working has to be included as a control variable. Table A.5 presents the results of the sensitivity check, in which the net labor income of the last observed working spell is included as a proxy for the expected wage of a potential future employment. In line with the observation problem discussed in the last paragraph, as a first step of the sensitivity check, the sample is reduced to the sample of women who are observed in employment at some point in the SOEP and thus have a valid observation of (last) labor net income (column (2)). In line with the discussion above, the estimated marginal effect of LOC drops significantly due to the endogeneity issue in data availability. Nevertheless, if the reduced sample is used and the last labor net income is included as a control variable, this does not further change the estimated coefficient for LOC. The coefficient of the last net labor income has the expected positive sign. The estimated relationship between LOC and the participation decision is thus not at risk of being driven by differences in the expected wages between internal and external women. (H3.1) can thus also be rejected with respect to a demand-side response to LOC via higher expected wages, too.

**Assortative Mating - Partner's Wage and LOC** As a third set of variables that might explain parts of the estimated relationship, information on a woman's partner has to be controlled for. Fortunately, the SOEP allows me to merge cohabiting women to their partners. Thus, Table A.6 presents the results of the sensitivity check, in which the partner's current net labor income as well as the continuous LOC factor of the partner is included as an additional control variable for cohabiting women. In line with the procedure in the paragraphs above, column (2) of Table A.6 presents the results of the baseline estimation for the reduced sample of all women for which I am able to merge partner's wages and locus of control. As can be seen in columns (3) and (4) the results do not change if partner's net income and LOC is included as a control variable, indicating that the results of the main estimation are not severely biased through assortative mating. Nevertheless, as already discussed in the theoretical considerations, also the partners gender attitudes might affect a woman's participation decision, but are at risk of being associated with a woman's LOC through assortative mating. Nevertheless, information on values and attitudes is not available from the SOEP and can thus not be ruled out. The fact that the

positive relationship between LOC and participation decisions can also be identified for single mothers does nevertheless reassure me that the channel proposed in (H3.2) does not drive large parts of the estimated relationship.

## 5 Sensitivity Analysis

**Estimation Method** In order to assess the sensitivity of the results also with respect to the chosen method, the results for the main estimation for the sample of all women are replicated, using a simple logit model with clustered standard errors as well as a random effects linear probability model instead of the random effects logit. The results are presented in Table A.7 in the Appendix. The estimated results of both alternatives do only marginally differ from the random effects logit estimation in effect size.

**Definition of Labor Force Participation** In addition to the method choice, also the definition of the dependent variable might be at risk of significantly affecting the estimated marginal effects. In order to assess the sensitivity of the results with respect to the choices made about the participation indicator described in Section 3.1, Table A.8 in the Appendix gives the corresponding estimation results for the full sample of all women when the definition of labor force participation is slightly adjusted. In the dependent variable used for the estimations in columns (3) and (4), also women who are marginally attached to the labor force are counted as “in the labor force”. Women who are not in the labor force (not working) are considered to be marginally attached if they are either actively looking for work (but potentially not able to start immediately) or if they intent to work and are available to start working (but potentially not searching actively). The estimated effects change only marginally through this adjustment. The most radical change was made to the dependent variable for the sensitivity check in columns (5) and (6). In the new dependent variable for those estimations, search behavior and intention to work is not considered at all. The variable is purely based on the status of labor force participation i.e. being registered unemployed or not. Women who are not registered unemployed but are nevertheless searching for a job, independent from the unemployment agency, are counted as not being available to the labor force, whereas women who are registered unemployed but indicate that they are not searching are assumed to be participating. The estimated effects do drop if this alternative dependent variable is used, due to the missing behavioral components in the dependent variable. Nevertheless, the results remain significantly positive also if only the pure status is considered. In a last robustness check, a slight adjustment is made to the definition of “intention to work” in columns (7) and (8). Here, also those women, who indicate that they

“probably” intent to work, are counted as participating in the labor force. This adjustment does not alter the estimated effects either.

**LOC Measurement** As a last sensitivity check, the measurement of locus of control itself is tested. Table A.9 in the Appendix gives the results of two alternative forms of construction and imputation of the LOC factor. Columns (3) and (4) give the results of the main specification for the full sample of all women, analog to the baseline in columns (1) and (2) when varying the construction of the LOC factor in the observation years. Instead of using the results of the factor analysis, the “simple index” assumes equal weights of all 8 items used, and a simple average over all item responses is calculated. The results differ only marginally from those in the baseline.

Secondly, the timing of the LOC measurement and thus the imputation approach is tested. Based on the findings in Preuss and Hennecke (2018), the procedure of lagging the LOC observations by one year does not prevent a reverse causality bias due to a temporary measurement error in LOC during periods of (registered and unregistered) unemployment. Due to the fact that employed and non-employed individuals are pooled in the estimation sample, I might risk biased results due to a measurement bias in LOC, which would, by definition, be greater in the group of non-participating women due to a higher share of non-employed individuals in this group<sup>25</sup>. In order to circumvent this measurement problem, I use the LOC observation during the closest employment or self-employment spell to  $t$ . The two conditions for imputing the LOC observation from a period  $t + x$  or  $t - x$  into  $t$  is that (a) LOC has to be observed in this year and (b) the woman is observed employed or self-employed in that year. I also allow for backwards imputation to avoid problems with sample size<sup>26</sup>. Columns (7) and (8) of Table A.9 present the results for this alternative approach of imputation for the LOC factor. Although still positive and significant, the estimated effect is now considerably smaller, which might indicate an actual problem of reverse causality in the estimated relationship. Nevertheless, this approach of imputation has one main caveat: through imputing from the closest employment spell, I lose all women who are never observed in (self-)employment. This is largely in line with the problems discussed in the first paragraph of the sensitivity section. Never being observed in (self-)employment is highly endogenous to the model which might be the reason for the lower estimated effect. Columns (5) and (6) thus check the effect of the LOC variable in the baseline model, using only the sample of women for which the LOC variable from the closest employment is observed. As expected, the reduction of the estimated effect is purely driven by the selectivity

---

<sup>25</sup>While in the group of participating women potentially only some of the women, i.e. those who are unemployed, might have a state-biased in their observed LOC, the share is expected to be greater in the group of non-participating women as 100% of women in this sample might be affected by such a state-bias.

<sup>26</sup>This is based on the assumption that, besides measurement bias in LOC though non-employment, non-employment has no long-term effect on LOC based on the findings in Preuss and Hennecke (2018).

of the sample in (7) and (8) and not by the new LOC measure.

## 6 Conclusion

Labor economists nowadays largely agree on a high importance of non-pecuniary incentives for labor force participation. Additionally, it is known that the elasticity with respect to own and partner's wages is still considerably lower for men than for women. Both observations combined only allow for one conclusion, which is that men are likely to put a greater weight on non-monetary incentives for labor force participation. In societies that are characterized by a still very traditional gender role model in combination with the social norm of being economically independent and thus being the "breadwinner" for the family, men are more likely to participate in the labor force, independent from potential differences in the monetary incentives, such as e.g. the gender wage gap. Nevertheless, in modern western societies, more and more women are observed to make participation decisions similar to their partners at the extensive margin, i.e. largely independent from expected own and partners earnings. The question remains what drives differences in the role of monetary and non-monetary incentives between women.

This paper contributes to this question by theoretically and empirically discussing the role of the personality trait locus of control for differences in participation probabilities between women. Based on the theoretical considerations and the findings of the empirical part of the paper, locus of control can be assumed to affect participation probabilities mainly via the weighting of non-pecuniary incentives for working in the participation equation. A reduced form estimation, which used data from the SOEP and a random effects logit model, found that internal women, i.e. women who believe in the importance of own efforts for life's outcomes, are on average more likely to participate in the labor force also conditional on traditional socio-economic factors. Based on the heterogeneity analysis, which identified interesting non-linearities of the effect with respect to prevailing gender roles and social norms for working, the theoretical hypothesis, that internal women might feel a higher urge to fit into the social norm of "earning your own living", was strongly supported. Those women put a higher weight on economic and financial independence as a non-pecuniary incentives for working and thus gain higher marginal utility from participation, holding monetary incentives constant. The very high effect, which was identified for single mothers, additionally indicates that this importance of LOC for an individual's suggestibility by social norm might be even more pronounced when talking about economic independence from social transfer systems rather than partners.

Overall, the paper significantly adds to the existing economic literature on female labor force participation by suggesting and empirically identifying important behavioral implications

of personality traits in the participation decision and thus contributes to closing the knowledge gap on labor force participation decisions in general. Additionally, the identified importance of locus of control for a woman's decision-making process has crucial implications for the pervasive political discourse about low labor force participation rates of women in general and in specific labor force return rates of mothers. When discussing potential political measures that are targeted at increasing participation rates, such as quotas or childcare availability and costs, it is thus highly important to understand the boundaries of monetary incentives set by latent psychological characteristics, inherent preferences and social norms.

## References

- AKERLOF, G. A. and KRANTON, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, **115** (3), 715–753.
- ANGRIST, J. (2002). How Do Sex Ratios Affect Marriage and Labor Markets ? Evidence from America’s Second Generation. *The Quarterly Journal of Economics*, **117** (3), 997–1038.
- ANGRIST, J. D. and EVANS, W. N. (1998). Family Size Children and Their Parents Labor Supply: Evidence from Exogenous Variation in Family Size. *The American Economic Review*, **88** (3), 450–477.
- and PISCHKE, J. S. (2008). *Mostly harmless econometrics: an empiricist’s companion*. Princeton University Press.
- ASHENFELTER, B. Y. O. and HECKMAN, J. (1974). The Estimation of Income and Substitution Effects in a Model of Family Labor Supply. *Econometrica*, **42** (1), 73–85.
- AUTOR, D. H., KATZ, L. F. and KEARNEY, M. S. (2008). Trends in U.S. wage inequality: Revising the revisionists.
- BAILEY, M. J. (2006). More power to the pill: The impact of contraceptive freedom on women’s life cycle labor supply. *Quarterly Journal of Economics*, **121** (1), 289–320.
- BERGER, E. M. and HAYWOOD, L. (2016). Locus of control and mothers’ return to employment. *Journal of Human Capital*, **10** (4), 442–481.
- BERTRAND, M. (2010). New perspectives on gender. In O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics*, vol. 4b, Elsevier, pp. 1543–1590.
- , PAN, J. and KAMENICA, E. (2015). Gender Identity and Relative Income Within Households. *The Quarterly Journal of Economics*, **130** (2), 571–614.
- BLAU, F. D. (1998). Trends in the well-being of American women, 1970-1995. *Journal of Economic Literature*, **36**, 112–165.
- and KAHN, L. M. (2007). Changes in the labor supply behaviour of married women: 1980-2000. *Journal of Labor Economics*, **25** (3), 393–438.
- and — (2017). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature*, **55** (3), 789–865.
- BLUNDELL, R. and MACURDY, T. (1999). Labor supply: A review of alternative approaches. In O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics*, volume 3 edn., Amsterdam: Elsevier, pp. 1559–1695.
- BRAUN, M., SCOTT, J. and ALWIN, D. F. (1994). Economic necessity or self-actualization? Attitudes toward women’s labour-force participation in East and West Germany. *European Sociological Review*, **10** (1), 29–47.
- CALIENDO, M., COBB-CLARK, D. A., HENNECKE, J. and UHLENDORFF, A. (2015a). Job Search, Locus of Control and Internal Migration. *IZA Discussion Paper*, No. 9600.
- , — and UHLENDORFF, A. (2015b). Locus of control and job search strategies. *Review of Economics and Statistics*, **97** (1), 88–103.
- , FOSSEN, F. and KRITIKOS, A. S. (2014). Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics*, **42** (4), 787–814.
- CARODSO, A. R. and MORIN, L.-P. (2018). Can Economic Pressure Overcome Social Norms? The Case of Female Labor Force Participation — IZA - Institute of Labor Economics. *IZA Discussion Paper Series*, No. 11822.
- CHARLES, K. K., GURRYAN, J. and PAN, J. (2018). The Effects of Sexism on American Women: The Role of Norms vs. Discrimination. *NBER Working Paper Series*, No. 24904.

- CLARK, A. E. (2003). Unemployment as a Social Norm: Psychological Evidence from Panel Data. *Journal of Labor Economics*, **21** (2), 323–351.
- COBB-CLARK, D. A. (2015). Locus of control and the labor market. *IZA Journal of Labor Economics*, **4** (1), 1–19.
- and SCHURER, S. (2013). Two economists’ musings on the stability of locus of control. *The Economic Journal*, **123** (570), F358–F400.
- and TAN, M. (2011). Noncognitive skills, occupational attainment, and relative wages. *Labour Economics*, **18** (1), 1–13.
- COGAN, J. (1980). Labor Supply with Costs of Labor Market Entry. In J. P. Smith (ed.), *Female Labor Supply: Theory and Estimation*, Chapter 7, Princeton University Press, pp. 327 – 364.
- COLEMAN, M. and DELEIRE, T. (2003). An economic model of locus of control and the human capital investment decision. *Journal of Human Resources*, **38** (3), 701–721.
- CORTES, P. and PAN, J. (2018). Occupation and Gender. In S. L. Averett, L. M. Argys and S. D. H. Hoffman (eds.), *Oxford Handbook on the Economics of Women*, New York: Oxford University Press.
- COSTA, D. L. (2000). From Mill Town to Board Room: The Rise of Women’s Paid Labor. *Journal of Economic Perspectives*, **14** (4), 101–122.
- COTTER, D., HERMSEN, J. M. and VANNEMAN, R. (2011). The End of the Gender Revolution? Gender Role Attitudes from 1977 to 2008. *American Journal of Sociology*, **117** (1), 259–289.
- DEVEREUX, P. J. (2004). Changes in Relative Wages and Family Labor Supply. *The Journal of Human Resources*, **39** (3), 696.
- EISSA, N. and LIEBMAN, J. B. (1996). Labor Supply Response to the Earned Income Tax Credit. *The Quarterly Journal of Economics*, **111** (2), 605–637.
- EVERS, M., MOOLIJ, R. and VUUREN, D. (2008). The wage elasticity of labour supply: A synthesis of empirical estimates. *Economist*, **156** (1), 25–43.
- FORTIN, N. M. (2015). Gender Role Attitudes and Women’s Labor Market Participation: Opting-Out, AIDS, and the Persistent Appeal of Housewifery. *Annals of Economics and Statistics*, **117/118**, 379–401.
- GOLDIN, C. (1990). *Understanding the gender gap : an economic history of American women*. Oxford University Press, Inc.
- (2006). The Quiet Revolution that Transformed Women’s Employment, Education, and Family. *The American Economic Review*, **96**, 1–21.
- and KATZ, L. F. (2002). The Power of the Pill: Oral Contraceptives and Women’s Career and Marriage Decisions. *Journal of Political Economy*, **110** (4), 730–770.
- GREENWOOD, J., SESHADRI, A. and YORUKOGLU, M. (2005). Engines of liberation. *Review of Economic Studies*, **72** (1), 109–133.
- GRONAU, R. (1973). The Effect of Children on the Housewife’s Value of Time. *Journal of Political Economy*, **81** (2), 168–199.
- HAUSMAN, J. A. (1980). The effect of wages, taxes, and fixed costs on women’s labor force participation. *Journal of Public Economics*, **14** (2), 161–194.
- HECKMAN, J. J., STIXRUD, J. and URZUA, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, **24** (3), 411 – 482.
- HEIM, B. T. (2007). The Incredible Shrinking Elasticities: Married Female Labor Supply, 1978–2002. *J. Human Resources*, **XLII** (January 2007), 881–918.



- HEINECK, G. and ANGER, S. (2010). The returns to cognitive abilities and personality traits in Germany. *Labour Economics*, **17** (3), 535–546.
- HETSCHKO, C., KNABE, A. and SCHÖB, R. (2014). Changing identity: retiring from unemployment. *The Economic Journal*, **124** (575), 149–166.
- HEYWOOD, J. S., JIRJAHN, U. and STRUEWING, C. (2017). Locus of control and performance appraisal. *Journal of Economic Behavior & Organization*, **142**, 205–225.
- INTERNATIONAL LABOUR ORGANIZATION (2018). Labour Force. [http://www.ilo.org/global/statistics-and-databases/statistics-overview-and-topics/WCMS\\_{\\_}470304/lang--en/index.htm](http://www.ilo.org/global/statistics-and-databases/statistics-overview-and-topics/WCMS_{_}470304/lang--en/index.htm), accessed: 2018-05-07.
- JAHODA, M. (1981). Work, employment, and unemployment: Values, theories, and approaches in social research. *American Psychologist*, **36**, 184–191.
- JUHN, C. and MURPHY, K. M. (1997). Wage Inequality and Family Labor Supply. *Journal of Labor Economics*, **15** (1), 72–97.
- KILLINGSWORTH, M. R. and HECKMAN, J. J. (1986). Female labor supply: A survey. In O. C. Ashenfelter and R. L. Layard (eds.), *Handbook of Labor Economics*, vol. 1, *Chapter 2*, Amsterdam: Elsevier Science Publishers BV, pp. 103–204.
- KIMMEL, J. and KNIESNER, T. J. (1998). New evidence on labor supply:: Employment versus hours elasticities by sex and marital status. *Journal of Monetary Economics*, **42**, 289–301.
- KNABE, A., SCHÖB, R. and WEIMANN, J. (2016). Partnership , Gender Roles and the Well-Being Cost of Unemployment. *Social Indicators Research*, **129** (3), 1255–1275.
- LUNDBERG, S. (1988). Labor supply of husbands and wives: A simultaneous equations approach. *The Review of Economics and Statistics*, **70** (2), 224–235.
- MCGEE, A. and MCGEE, P. (2016). Search, effort, and locus of control. *Journal of Economic Behavior and Organization*, **126** (2), 89–101.
- MCGRATTAN, E. R. and ROGERSON, R. (2008). Changes in the Distribution of Family Hours Worked Since 1950. In P. Rupert (ed.), *Frontiers of Family Economics*, *3*, Amsterdam: Emerald Group Publishing Limited, pp. 115 – 138.
- MINCER, J. (1962). Labor Force Participation of Married Women: A Study of Labor Supply. In National Bureau Committee for Economic Research (ed.), *Aspects of Labor Economics*, Princeton University Press, pp. 63–106.
- (1985). Inter-country comparisons of labor force trends and of related developments: An overview. *Journal of Labor Economics*, **3** (1), 1–32.
- OPPENHEIMER, V. K. (1970). *The female labor force in the United States; demographic and economic factors governing its growth and changing composition*. Westport, CT: Greenwood Press.
- PAUNONEN, S. V. and ASHTON, M. C. (2001). Big Five Factors and Facets and Prediction of Behavior. *Journal of Personality and Social Psychology*, **81** (3), 524 – 539.
- PIATEK, R. and PINGER, P. (2016). Maintaining (locus of) control? Data combination for the identification and inference of factor structure models. *Journal of Applied Econometrics*, **31** (4), 734–755.
- PREUSS, M. and HENNECKE, J. (2018). Biased by success and failure: How unemployment shapes locus of control. *Labour Economics*, **53**, 63–74.
- REIMERS, C. (1985). Cultural Differences in Labor Force Participation Among Married Women. *the American Economic Review*, **75** (2), 251–255.
- ROBERTS, B. W. (2009). Back to the future: personality and assessment and personality development. *Journal of Research in Personality*, **43** (2), 137–145.

- ROSENFELD, R. A., TRAPPE, H. and GORNICK, J. C. (2004). Gender and Work in Germany: Before and After Reunification. *Annual Review of Sociology*, **30** (1), 103–124.
- ROSS, C. E., MIROWSKY, J. and HUBER, J. (1983). Dividing work, sharing work, and in-between: marriage patterns and depression. *American sociological review*, **48** (6), 809–823.
- ROTTER, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, **80** (1), 1–28.
- SCHÖB, R. (2013). Unemployment and identity. *CESifo Economic Studies*, **59** (1), 149–180.
- SMITH, J. P. and WARD, M. P. (1985). Time-Series Growth in the Female Labor Force. *Journal of Labor Economics*, **3** (2), S59–S90.
- SOEP (2017). Socio Economic Panel Data: data for years 1984–2016, version 33, doi: 10.5684/soep.v33.
- WAGNER, G., FRICK, J. R. and SCHUPP, J. (2007). The German Socio-Economic Panel Study (SOEP): scope, evolution and enhancements. *Schmollers Jahrbuch*, **127** (1), 139–170.
- WEINBERG, B. A. (2000). Computer use and the demand for female workers. *Industrial and Labor Relations Review*, **53** (2), 290–308.
- WICHERT, L. and POHLMEIER, W. (2010). Female labor force participation and the big five, ZEW Discussion Paper 10-003. *ZEW Discussion Paper*, **No. 10-003**.

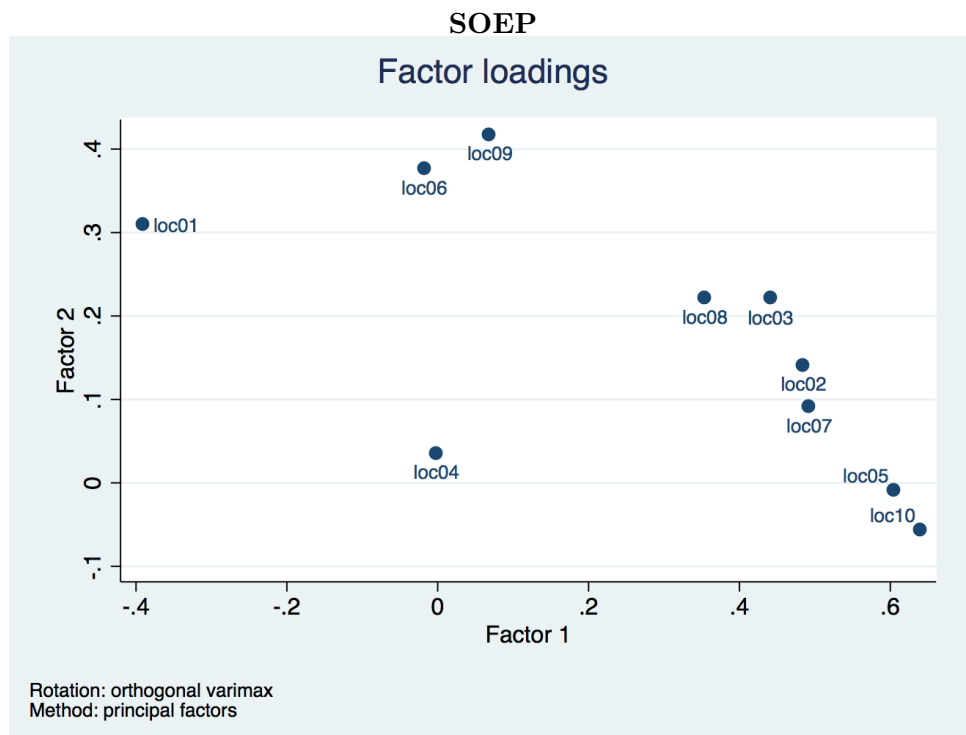
## A Appendix

Table A.1: Descriptive Statistics

	(1) All <i>mean</i>	(2) Children under 16 <i>mean</i>	(3) Not Cohabiting <i>mean</i>	(4) Cohabiting <i>mean</i>
<b>Family Status</b>				
Single	0.14	0.08	0.68	
Partner not in HH	0.07	0.05	0.32	
Partner in HH	0.10	0.09		0.13
Married	0.69	0.78		0.87
Number of Children	1.61	2.03	1.19	1.72
<b>Children Age Indicators</b>				
Child under 1	0.03	0.07	0.01	0.03
Child 1 - 3	0.06	0.15	0.02	0.07
Child 3 - 7	0.12	0.33	0.06	0.14
Child between 7 and 16	0.27	0.72	0.20	0.29
<b>Age Categories</b>				
25 - 34 Years	0.20	0.31	0.28	0.19
35 - 44 Years	0.29	0.52	0.26	0.30
45 - 54 Years	0.31	0.16	0.29	0.31
55 - 65 Years	0.19	0.00	0.18	0.20
<b>Religion</b>				
Confessionless	0.32	0.27	0.37	0.31
Christian	0.64	0.67	0.61	0.65
Muslim	0.02	0.03	0.01	0.02
Other	0.02	0.03	0.01	0.02
East-Germany	0.27	0.24	0.29	0.26
<b>Highest School Degree</b>				
No School Degree	0.02	0.02	0.01	0.02
Lower Secondary School	0.24	0.20	0.23	0.24
Intermediary School	0.40	0.42	0.37	0.41
Highschool	0.28	0.29	0.33	0.27
Other School	0.06	0.07	0.05	0.07
<b>Highest Vocational Degree</b>				
No Vocational Diploma	0.15	0.16	0.16	0.15
Apprenticeship	0.43	0.42	0.41	0.43
Higher Technical College	0.28	0.30	0.28	0.29
College or University Degree	0.24	0.21	0.26	0.23
In Bad Health	0.14	0.10	0.17	0.13
<b>Personality and Preferences</b>				
Willingness to take risk (std., avg.)	-0.20	-0.18	-0.10	-0.22
Openness (std., avg.)	0.03	0.01	0.12	0.01
Conscientiousness (std., avg.)	0.07	0.04	0.07	0.07
Extraversion (std., avg.)	0.10	0.17	0.10	0.11
Agreeableness (std., avg.)	0.18	0.20	0.13	0.19
Neuroticism (std., avg.)	0.15	0.16	0.12	0.15
Observations	65453	24869	13337	52116
Individuals	9384	4234	2858	7780

Source: SOEP, waves 2000 - 2016, version 33.

Figure A.1: Factor Loadings of the LOC Variable



Source: SOEP, waves 1999, 2005, 2010 and 2015, version 33, own illustration.

Table A.2: Main Results (Average Marginal Effects) - Full Results

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>All</b>			<b>Children under 16</b>		
	All	N.Cohab.	Cohab.	All	N.Cohab.	Cohab.
LOC Factor Tertiles (Ref.: [ $LOC_{min}, LOC_{P33}$ ]))						
( $LOC_{P33}, LOC_{P66}$ )	0.013*** (0.003)	0.004 (0.003)	0.015*** (0.004)	0.022*** (0.007)	0.008** (0.004)	0.016*** (0.006)
( $LOC_{P66}, LOC_{max}$ )	0.012*** (0.003)	0.005* (0.003)	0.013*** (0.004)	0.021*** (0.007)	0.010** (0.004)	0.017*** (0.006)
Family Status (Ref.: Single)						
Partner not in HH	-0.001 (0.004)	0.002 (0.003)		-0.005 (0.011)	0.003 (0.005)	
Partner in HH	-0.011*** (0.004)			-0.018* (0.011)		
Married	-0.045*** (0.003)		-0.035*** (0.004)	-0.048*** (0.009)		-0.051*** (0.006)
Number of Children	-0.020*** (0.002)	-0.004** (0.002)	-0.025*** (0.003)	-0.041*** (0.004)	-0.005*** (0.002)	-0.038*** (0.004)
Has Child under 1	-0.805*** (0.012)	-0.707*** (0.067)	-0.821*** (0.011)	-0.782*** (0.011)	-0.725*** (0.063)	-0.774*** (0.012)
Has Child 1 - 3 Years	-0.319*** (0.013)	-0.294*** (0.039)	-0.342*** (0.014)	-0.310*** (0.015)	-0.326*** (0.042)	-0.291*** (0.014)
Has Child 3 - 7 Years	-0.046*** (0.004)	-0.060*** (0.011)	-0.046*** (0.005)	-0.031*** (0.006)	-0.073*** (0.013)	-0.027*** (0.005)
Has Child 7 - 16 Years	-0.010*** (0.003)	-0.012*** (0.004)	-0.008** (0.004)	0.020** (0.008)	-0.016*** (0.005)	0.012* (0.007)
Age Categories (Ref.: 25 - 34 Years)						
35 - 44 Years	0.012*** (0.003)	0.001 (0.003)	0.015*** (0.004)	0.028*** (0.007)	0.005 (0.005)	0.021*** (0.006)
45 - 54 Years	0.006 (0.004)	0.000 (0.004)	0.007 (0.005)	0.042*** (0.010)	0.001 (0.006)	0.032*** (0.009)
55 - 65 Years	-0.055*** (0.007)	-0.017*** (0.006)	-0.069*** (0.008)	0.020 (0.039)	-0.020** (0.009)	-0.015 (0.023)
Religion (Ref.: Confessionless)						
Christian	-0.002 (0.004)	0.002 (0.003)	-0.003 (0.005)	-0.002 (0.009)	0.003 (0.005)	-0.005 (0.008)
Muslim	-0.043*** (0.014)	-0.059** (0.029)	-0.048*** (0.017)	-0.098*** (0.026)	-0.054* (0.032)	-0.091*** (0.024)
Other	-0.030*** (0.011)	0.003 (0.009)	-0.044*** (0.015)	-0.056** (0.022)	0.004 (0.012)	-0.067*** (0.021)
East-Germany	0.031*** (0.004)	-0.008* (0.005)	0.049*** (0.005)	0.048*** (0.009)	-0.011* (0.006)	0.043*** (0.008)
Highest School Degree (Ref: No Degree)						
Lower Secondary School	0.018 (0.014)	0.018 (0.012)	0.011 (0.018)	0.075*** (0.027)	0.024 (0.015)	0.055** (0.024)
Intermediary School	0.056*** (0.013)	0.034*** (0.012)	0.056*** (0.016)	0.112*** (0.031)	0.040*** (0.014)	0.087*** (0.027)
Highschool	0.053*** (0.010)	0.035*** (0.009)	0.052*** (0.013)	0.105*** (0.025)	0.042*** (0.011)	0.082*** (0.022)
Other School	0.027** (0.011)	0.015* (0.008)	0.025 (0.016)	0.053** (0.026)	0.018* (0.011)	0.037 (0.023)
Highest Vocational Degree (Ref.: No Vocational Diploma)						
Apprenticeship	0.026*** (0.005)	0.011** (0.004)	0.026*** (0.007)	0.034*** (0.011)	0.013** (0.006)	0.020** (0.010)
Higher Technical College	0.038*** (0.005)	0.020*** (0.004)	0.040*** (0.006)	0.050*** (0.010)	0.027*** (0.005)	0.031*** (0.009)
College or University Degree	0.045*** (0.004)	0.012*** (0.004)	0.053*** (0.006)	0.063*** (0.010)	0.013** (0.006)	0.052*** (0.009)
In Bad Health	-0.023*** (0.003)	-0.025*** (0.004)	-0.021*** (0.004)	-0.030*** (0.008)	-0.031*** (0.005)	-0.022*** (0.007)
Willingness to Take Risk (std., avg.)	0.012*** (0.003)	0.001 (0.003)	0.018*** (0.004)	0.010 (0.007)	0.003 (0.004)	0.011** (0.006)

Continued on next page...

... continued from previous page

	(1)	(2)	(3)	(4)	(5)	(6)
Openness (std., avg.)	-0.002 (0.003)	0.003 (0.002)	-0.005 (0.003)	-0.001 (0.006)	0.003 (0.003)	0.001 (0.005)
Conscientiousness (std., avg.)	0.016*** (0.003)	0.007*** (0.002)	0.019*** (0.004)	0.020*** (0.006)	0.011*** (0.003)	0.013*** (0.005)
Extraversion (std., avg.)	0.009*** (0.002)	-0.000 (0.002)	0.014*** (0.003)	0.014*** (0.005)	-0.001 (0.003)	0.013*** (0.004)
Agreeableness (std., avg.)	-0.005* (0.003)	-0.001 (0.002)	-0.004 (0.003)	-0.008 (0.006)	-0.002 (0.003)	-0.007 (0.005)
Neuroticism (std., avg.)	-0.012*** (0.003)	-0.003 (0.002)	-0.015*** (0.004)	-0.009* (0.006)	-0.004 (0.003)	-0.007 (0.005)
Observations	65453	13337	52116	24869	10202	25992
Year Fixed-Effects	✓	✓	✓	✓	✓	✓

Source: SOEP 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.3: Heterogeneity Analysis: Age of Children

	Children under 7			Children 16 or older		
	All (1)	N.Cohab. (2)	Cohab. (3)	All (4)	N.Cohab. (5)	Cohab. (6)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])						
( $LOC_{P33}$ , $LOC_{P66}$ )	0.040*** (0.014)	0.079** (0.038)	0.031** (0.015)	0.006** (0.003)	0.001 (0.003)	0.010*** (0.004)
( $LOC_{P66}$ , $LOC_{max}$ )	0.040*** (0.015)	0.092** (0.041)	0.031* (0.016)	0.010*** (0.003)	-0.001 (0.004)	0.015*** (0.004)
Observations	11352	1080	10272	27677	4827	22845
Year Fixed-Effects	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.4: Sensitivity Analysis: Employment Characteristics (Sample: All)

	(1)	(2)	(3)	(4)	(5)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])					
( $LOC_{P33}$ , $LOC_{P66}$ )	0.013*** (0.003)	0.011*** (0.003)	0.010*** (0.003)	0.009*** (0.002)	0.009*** (0.002)
( $LOC_{P66}$ , $LOC_{max}$ )	0.012*** (0.003)	0.011*** (0.003)	0.010*** (0.003)	0.008*** (0.002)	0.009*** (0.002)
Occupational Type in Last Employment (Ref: Bluecollar Worker)					
Whitecollar Worker			0.005 (0.003)		
Civil Servant			0.025*** (0.006)		
Other Occupations			-0.071*** (0.025)		
Industry in Last Employment (Ref: Manufacturing)					
Agriculture					-0.028** (0.013)
Mining, Quarring, Energy, Water					0.028*** (0.010)
Chemicals, Pulp, Paper					0.012** (0.006)
Construction					0.015** (0.007)
Iron/Steel					-0.006 (0.009)
Textile/Apparel					-0.068*** (0.017)
Wholesale/Retail					-0.001 (0.005)
Transport/Communication					0.014** (0.006)
Public Service					0.020*** (0.004)
Financials/ Private Services					0.005 (0.005)
Other					0.008 (0.005)
Observations	65452	63856	63856	60789	60789
Year Fixed-Effects	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓

Source: Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.5: Sensitivity Analysis: Expected Wage Differences (Sample: All)

	(1) Full Sample	(2)	(3) Reduced Sample
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])			
( $LOC_{P33}$ , $LOC_{P66}$ )	0.013*** (0.003)	0.008*** (0.002)	0.008*** (0.002)
( $LOC_{P66}$ , $LOC_{max}$ )	0.012*** (0.003)	0.009*** (0.002)	0.008*** (0.002)
(Last) Net Labor Income in KEUR			0.017*** (0.002)
Observations	65453	61372	61372
Year Fixed-Effects	✓	✓	✓
Family Controls	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓
Personality Controls	✓	✓	✓

Source: Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.6: Sensitivity Analysis: Partners Wage and Personality (Sample: Cohabiting)

	(1) Full Sample	(2)	(3) Reduced Sample	(4)
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])				
( $LOC_{P33}$ , $LOC_{P66}$ )	0.015*** (0.004)	0.014*** (0.004)	0.015*** (0.004)	0.015*** (0.004)
( $LOC_{P66}$ , $LOC_{max}$ )	0.013*** (0.004)	0.012*** (0.005)	0.013*** (0.005)	0.013*** (0.005)
Partners Net Labor Income in KEUR			-0.007*** (0.001)	-0.007*** (0.001)
Partners LOC Factor (cont.)				-0.000 (0.002)
Observations	52116	34943	34943	34943
Year Fixed-Effects	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓

Source: Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.7: Sensitivity Analysis: Estimation Method (Sample: All)

	(1)	(2)	(3)	(4)	(5)	(6)
		Baseline	Simple Logit	Clustered SE	Random Effects	Linear Probability
LOC Factor (cont.)	0.007*** (0.001)		0.008*** (0.003)		0.007*** (0.002)	
Locus of Control Tertiles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])						
( $LOC_{P33}$ , $LOC_{P66}$ )		0.013*** (0.003)		0.017*** (0.006)		0.012*** (0.003)
( $LOC_{P66}$ , $LOC_{max}$ )		0.012*** (0.003)		0.014** (0.007)		0.012*** (0.004)
Observations	65453	65453	65453	65453	65453	65453
Year Fixed-Effects	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Table A.8: Sensitivity Analysis: Participation Definitions (Sample: All)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline		Marginal Attachment <sup>1</sup>		Status (w/o search) <sup>2</sup>		Baseline w. broader intention <sup>3</sup>	
LOC Factor (cont.)	0.007*** (0.001)		0.006*** (0.001)		0.004*** (0.001)		0.007*** (0.001)	
Locus of Control Terciles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])								
( $LOC_{P33}$ , $LOC_{P66}$ )		0.013*** (0.003)		0.011*** (0.003)		0.009*** (0.003)		0.013*** (0.003)
( $LOC_{P66}$ , $LOC_{max}$ )		0.012*** (0.003)		0.010*** (0.003)		0.007** (0.003)		0.012*** (0.003)
Observations	65453	65453	65453	65453	65453	65453	65453	65453
Year Fixed-Effects	✓	✓	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

<sup>1</sup> Specification is equal to baseline but includes also women who are marginally attached to the labor force into the group of women in the labor force.

<sup>2</sup> Labor force definition purely based on status, no information on active job-search.

<sup>3</sup> Equal to baseline but also includes women who only “probably” intent to return to the labor force for non-working women.

Table A.9: Sensitivity Analysis: Locus of Control Measurement (Sample: All)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lagged (Baseline)		Simple Index <sup>1</sup>		Lagged Reduced sample		Closest Employment <sup>2</sup>	
Loc Factor (cont.)	0.007*** (0.001)		0.007*** (0.001)		0.004*** (0.001)		0.003*** (0.001)	
Locus of Control Terciles (Ref.: [ $LOC_{min}$ , $LOC_{P33}$ ])								
( $LOC_{P33}$ , $LOC_{P66}$ )		0.013*** (0.003)		0.011*** (0.003)		0.006*** (0.002)		0.006*** (0.002)
( $LOC_{P66}$ , $LOC_{max}$ )		0.012*** (0.003)		0.010*** (0.003)		0.006*** (0.002)		0.006*** (0.002)
Observations	65453	65453	65453	65453	57174	57174	57174	57174
Year Fixed-Effects	✓	✓	✓	✓	✓	✓	✓	✓
Family Controls	✓	✓	✓	✓	✓	✓	✓	✓
Socio-Demographic Controls	✓	✓	✓	✓	✓	✓	✓	✓
Personality Controls	✓	✓	✓	✓	✓	✓	✓	✓

Source: SOEP, waves 2000 - 2016, version 33, own calculations.

Notes: Standard Errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

<sup>1</sup> LOC Factor for each year is calculated using a simple average of all 8 items used and thus assuming equal weights of all items. The Index is then imputed using the same rule as in the Baseline (lagged).

<sup>2</sup> LOC Factor is calculated as usual for each year but is imputed from the closest LOC observation in which the individual was employed or self-employed and not from the last LOC observations.