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Germany's Next Top Manager: Does Personality Explain the Gender Career Gap?**

Many studies have focused on the influence of human capital and other 'objective' factors on career achievement. In our study, we go a step further by also looking at the impact of self-reported personality traits on differences in career chances. For the first time – to our knowledge – we compare managers and other white-collar employees in Germany's private sector and find evidence that personality traits do influence the promotion probability even though their impact is rather small.

With regard to differences in the promotion probability between women and men, bivariate results based on data from the German Socio-Economic Panel (SOEP) in 2007 show significant differences in personality traits. But multivariate estimations clearly indicate that these differences cannot account for gender differences in the promotion probability to a large extent. The decomposition (according to Fairlie, 2003) of the career gap between women and men shows that only 8.6 percent of the inequality of career chances can be explained by differences in personality. Nevertheless, personality traits might indeed play a role, albeit more indirectly: Some of the stronger career effects, such as long working hours, and labour market segregation, may also reflect differences in personality traits.

Key words: **personality, gender, career, leadership** (JEL: D23, J16, J79, M12)

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1. Introduction

Although women account for more than 50 percent of the German labour force, they are largely under-represented in leadership positions. The higher the hierarchical level, the lower the proportion of female leaders. About three out of ten business leaders are women (European Commission, 2009). Only 2.5 percent of the executive board members of the top 200 companies in Germany are female (Holst & Schimeta, 2009).

Numerous studies investigate career opportunities and focus on the influence of human capital and other 'objective' factors. But only a few quantitative studies employ non-cognitive skills such as personality.

Scientific interest in (personality) traits and their influence on access to leadership positions and leadership success has a long tradition. The trait theory of leadership focuses on personality traits that distinguish leaders from other employees. It aims at describing the characteristics of leaders in order to establish what factors determine professional success. It is one of the oldest theories in the field of leadership research. The results of numerous empirical studies on leadership traits that have been carried out in this context have been included in various summary papers (see for example, Lord et al., 1986; Stogdill, 1948; Stogdill & Bass, 1981).

The term career success can refer to both objective or extrinsic career success (income, the rate at which the income increases, the attainment of a higher professional status, or promotion probability, the number of subordinate employees, etc.) and subjective or intrinsic career success (job satisfaction, self-esteem, etc.). Empirical findings of early studies on this topic showed (weak) correlations between personality traits and the attainment of a higher professional status within organizations (promotion probability), demonstrating that leaders and followers differ with regard to the personality traits under investigation. The results, however, were ambiguous, and the causal connections remained unclarified. This led to an adjustment – and in some cases rejection – of the approach, which was considered unsuitable for predicting the behaviour and success of (potential) leaders. Criticism of the theory focussed on its limited capacity to represent and identify personality traits, arguing that situative factors such as leadership functions, the environment, and followers have at least an equally significant impact on leadership behaviour and career advancement (see for example, Delhees, 1995; Stogdill, 1948; Weibler, 2001).

At the beginning of the 1970s, new concepts were developed within the leadership research that drew on the findings of trait theory and are referred to as the 'neotrait theory of leadership' (Tisdale, 2004). Particularly worthy of mention in this context are the concepts of neo-charismatic and transformational leadership, coined by Weber (1922) (see for example, Bass & Avolio, 1990; House & Shamir, 1995). These concepts are of both a theoretical and empirical nature and are based on the assumption that 'transformational leadership [...] works through the one-sided change the leader brings about in the followers' (Weibler, 2001). According to Avolio (1999), transformational leadership comprises four components: influence through exemplary nature and credibility, motivation through inspiring visions, encouragement to think creatively and independently, and individual consideration and encouragement (see the summary in Felfe, 2006). Although the focus of these concepts is on leadership suc-

cess as a result of the relationship between leaders and followers, both deal with personality traits of leaders and stress the importance of personality when it comes to social interaction.

In the field of leadership research, there has been renewed interest in the influence of personality on (working and leadership) behaviour in recent years. This interest is attributed last but not least to the resounding success of what is referred to as the 'Big Five' concept. Psychological constructs are also being used increasingly in economic research as explanatory variables (see for example, Borghans et al., 2008; Almlund et al., 2011). Examples are the willingness to take risks as an explanatory variable for the selection in occupations with a high level of earnings risk/variability (Bonin et al., 2006) and the influence of the Big Five on earnings (Mueller & Plug, 2006; Nyhus & Pons, 2005).

Although the trait theory of leadership is the subject of harsh criticism amongst scientists, it still plays an important role in practice, both in the minds of those who select and promote leaders and in the minds of young leaders themselves. The selection and promotion of leaders is closely linked with test methods – in particular assessment centres – that attempt to measure personality traits in the tradition of the trait theory of leadership and to draw on these traits as decision criteria (Neuberger, 2002).

For some time now, particular attention has been paid to the issue of gender differences in leadership traits. Although many studies have found evidence that female leaders are no different from male leaders when it comes to factors such as task orientation, appraisal, and staff satisfaction (see for example, Dobbins & Platz, 1986), there are also studies that have found contrary results (Joy et al., 2007; Krell, 2008).

Neuberger (2002) emphasises weaknesses in the research design of the numerous studies on the trait theory of leadership: 'The typical study uses a new method to measure two to three personality traits in a highly specific population [...]' (Neuberger, 2002). We aim now to contribute to the empirical research on the relationship between personality and leadership (specifically the probability to be in a leadership position, or promotion probability) by means of well established measures of comprehensive and sophisticated psychological constructs for a large-scale dataset. Our analysis is based on the German Socio-Economic Panel (SOEP), a longitudinal household study which contains not only personality self-perceptions but also extensive additional information on the respondents' professional and private situations. We focus on personality traits to find out how they affect the promotion probability and to which extent they can explain the gender gap in leadership positions.

The study is structured as follows: Firstly, research findings on personality and the willingness to take risks relevant for explaining the probability to be in a leadership position are summarized, and hypotheses are formulated (section 2). The data base, variables, and methods used for the following analysis are introduced in section 3. The empirical findings are presented section 4. Finally, in section 5, the results are summarized and discussed.

2. Research on personality and career achievement, and hypotheses

Achieving a leadership position is only one out of many objective measures of career achievement or occupational success. The attainment of a higher professional status may also depend on non-cognitive skills. Following the theoretical approach of the trait theory of leadership, we could argue 'to be or not to be a manager depends on one's personality'. Although we will not answer the question of which personality traits influence leadership success (performance, wages, motivation of the followers, satisfaction, etc.), we illustrate the main findings from other empirical studies. However, the discussion of leadership competencies and the relation to leadership success goes beyond the scope of the paper. We base our analyses upon two personality constructs: the Big Five and the willingness to take risks, which are explained in more detail below. We also look at the state of research and the scientific discourse on personality and career achievement as well as gender-specific differences.

2.1 The Big Five Approach

The psychological approach known as the Big Five personality traits (also referred to as the 'Five Factor Model' (FFM); Costa & McCrae, 1992) is considered to be a good predictor of job performance and professional success, particularly for leaders. The main hypothesis of the concept is that personality differences between individuals can be determined on the basis of five central dimensions, i.e. neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Table 1). These personality dimensions are meant to conceive of personality as comprehensively as possible (thus the use of the term 'big').

Table 1: Overview of the Big Five personality traits and the impact on career achievement

Personality trait	Adjectives	(Direction of relationship) target variable (source)
Neuroticism	anxious, depressed, self-conscious, emotional, easily irritated, worried, insecure (reverse: emotional stability)	(-) work performance (Piedmont & Weinstein, 1994) (-) intrinsic career success (Boudreau et al., 2001) (-) men's wages (Mueller & Plug, 2006)
Openness to experience	imaginative, sophisticated, inventive, versatile, intellectual, open-minded, sensitive to beauty, also referred to as intellect or sophistication	(+) men's wages (Mueller & Plug, 2006) (+) women's wages (Mueller & Plug, 2006)
Agreeableness	friendly, polite, flexible, trusting, cooperative, tolerant, forgiving, soft-hearted	(-) extrinsic career success (Boudreau et al., 2001) (-) men's wages (Mueller & Plug, 2006)
Extraversion	sociable, communicative, generous, determined, dominant, active, impulsive	(+) work performance (Piedmont & Weinstein, 1994) (+) leadership ability (Furnham et al., 1997) (+) intrinsic career success (Boudreau et al., 2001) (+) extrinsic career success (Boudreau et al., 2001)
Conscientiousness	reliable, thorough, responsible, methodical, well-organised, achievement-oriented, persistent	(+) successful leadership (Barrick & Mount, 1991; Salgado, 1997; Tett et al., 1991) (+) leadership ability (Furnham et al., 1997) (+) women's wages (Mueller & Plug, 2006)

Source: Own summary, adjectives based on Schuler (2001)

The Big Five personality traits are considered to differ individually depending on behaviour and experience but to be stable for each individual over different situations.

Measured on the basis of the Big Five, personality score from the age of approx. 30 years is perceived in adults as nearly constant over a period of 20 to 45 years (Brandstätter, 1999; Srivastava et al., 2003). It is assumed, furthermore, that there is a normal distribution of the five personality dimensions in the overall population. High scores in the dimensions extraversion, conscientiousness, and emotional stability (= low neuroticism value) and low scores in the agreeableness dimension are considered to be particularly characteristic of successful leaders (Barrick & Mount, 1991; Boudreau et al., 2001; Furnham et al., 1997; Piedmont & Weinstein, 1994).

It has been empirically proven that there is a highly positive link with job performance across all professional groups for the conscientiousness dimension (Barrick & Mount, 1991; Tett et al., 1991; Salgado, 1997). Piedmont & Weinstein (1994) succeeded in proving that there is also a negative link with the neuroticism dimension and a positive link with the extraversion dimension. That is to say, low values in the neuroticism dimension (which is equivalent to high emotional stability) and high values in the extraversion dimension go hand in hand with higher job performance. Furnham et al. (1997) studied the relationship between the Big Five and the assessment of leadership ability in 160 leaders through external consultants. They confirmed the strong influence of the conscientiousness dimension and also proved that there is a strong positive link between leadership ability and the extraversion dimension. In their study, Boudreau et al. (2001) looked at the link between the Big Five and the career success of leaders in the US and Europe. With career success as the focus of attention, a distinction is made between extrinsic factors (remuneration, influence, status, chances of being employed) and intrinsic factors (occupation, life, career satisfaction). Some of the results confirmed the findings of past studies: Extraversion revealed a positive link and neuroticism a negative link with intrinsic career success. As regards the subjects' current and desired occupation, a positive correlation was found for the extraversion dimension and a negative correlation for the agreeableness dimension. This suggests that individuals consistently choose (work) situations that are compatible with their personality traits. Extroverted leaders thus tend to choose tasks or positions that enable them to live out their extroverted behaviour, whereas agreeable leaders tend to shy away from taking on a job in which they would have to struggle hard, for example.

In one of the very rare longitudinal studies, Mueller & Plug (2006) investigated how the Big Five personality traits influence wages for women and men. The study revealed that men with low scores in the agreeableness dimension and high scores in the openness to experience and emotional stability dimensions earned more than others. In these results, openness to experience had the greatest positive influence on wages, while extraversion and conscientiousness had no influence for men. However, women achieved a wage premium if they had high scores in the conscientiousness and openness to experience dimensions.

Based on the theoretical approaches of the trait theory of leadership and the empirical findings from other studies on the relationship between extrinsic career success and personality dimensions discussed above, it can be expected that leaders in the private sector in Germany rate themselves as more conscientious, more open to experience, more extroverted, less agreeable, less neurotic and more willing to take risks than employees who are not in a leadership position. The trait theory of leadership ar-

gues that these differences are not only significant in statistical terms but also relevant (or large in their effect size). This leads to the following hypothesis:

H1: Leaders are more conscientious, more open to experience, more extroverted, less agreeable and less neurotic (or more emotionally stable) than employees who are not in a leadership position. In other words, the promotion probability depends on these personality traits – in short: personality matters.

As far as gender is concerned, the trait theory of leadership is linked to the assumption that women and men differ in terms of significant personality traits. In this context it must be taken into account that personality traits are often attributed to women and men in dualistic form (e.g. rational/emotional, hard/soft). From this perspective, the traits are evaluated but not as neutral or equivalent in value. Rather, they are valued hierarchically, with traits considered to be masculine being rated as more significant (e.g. rational comes above emotional) (Keller, 1985; Nelson, 1996). Against this background, it can be assumed – particularly at the male-dominated leadership levels – that women have fewer chances of reaching a leadership position on account of their traits that actually exist in them (or the traits attributed to them and regarded as feminine). Based on the first hypothesis, this would mean that women have lower chances of being in a leadership position due to their personality. This in turn leads to the specific sub-hypothesis:

H1.1: The effect of personality on the promotion probability is significantly higher for women than for men – in short: personality matters more for women.

2.2 Willingness to take risks

In personality psychology, Andresen (1995) and other researchers have challenged the exhaustiveness of the Big Five for describing personality and have discussed the willingness to take risks as a sixth basic dimension of personality. Lopes & Berkowitz (1987) and Byrnes et al. (1999) distinguish among three categories into which theories to explain willingness to take risks can be classified:

- *Context-independent distinction* between risk-affine and risk-averse persons, i.e. differences in willingness to take risks should be independent of the situation. Accordingly, this approach claims that women are generally less willing to take risks than men and that leaders are generally more willing to take risks than non-leaders. Economic studies proceed on the assumption that there is a general willingness to take risks that influences behaviour in all areas of life (Dohmen et al., 2005).
- *Persons-independent distinction* between risk-affine and risk-averse situations. This approach implies that depending on the situation, people are willing to take risks if the options are presented positively, which would result in no differences between persons.
- *Context-dependent distinction* between risk-affine and risk-averse persons. In this case there are differences in risk behaviour as a result of the different ways the context is perceived and assessed. According to this approach, women would also be more willing to take risks in situations in which success is more important for them than it is for men.

In economics the expected utility framework includes risk propensity in a rational approach for decision making. The scientific debate emphasizes that willingness to take risks is an important indicator for career decisions and a good predictor of behavioural outcome (Dohmen et al., 2005). Various studies found a strong relationship between risk propensity and occupational sorting into jobs with higher earnings risk (Bonin et al., 2006; Dohmen & Falk, 2006; Pannenberg, 2007; Isphording, 2010). Risk attitudes are also found to have strong effects on entry and survival of entrepreneurs (Caliendo et al., 2006; Caliendo et al., 2011) but medium risk-averse entrepreneurs survive longer than those with low or high willingness to take risks (Caliendo et al., 2008). These findings can be compared to those for managers, who face a higher earnings risk and make decisions under uncertainty as part of their daily business. Earlier empirical studies found that risk-taking executives were the most successful, and it was hypothesized that '[t]he person who does not take risks is unlikely to get to the top' (MacCrimmon & Wehrung, 1990). Even though risk taking is an essential component of the managerial role, mangers' 'decisions are particularily affected by the way their attention is focussed on critical performance targets, and they make a sharp distinction between taking risk and gambling' (March & Shapira, 1987).

In addition to the more comprehensive construct of general willingness to take risks, our study focuses in particular on willingness to take risks in one's own professional career, which is more strongly linked to professional advancement (Dohmen et al., 2005). We will further focus on the context-dependent distinction between risk-affine and risk-averse persons. Also we understand the willingness to take risks, measured as self-assessments, as a broader concept of risk aversion that includes differences in ambiguity aversion. Based on the empirical findings discussed above we expect that:

H2: Leaders rate themselves both generally and in their professional career as more willing to take risks than employees who are not in a leadership position. Or in other words, the promotion probability depends on risk aversion – in short: risk aversion matters.

It is mostly assumed and empirically proven that in general women are more risk-averse than men (Dohmen et al., 2005; Dohmen & Falk, 2006). However Littmann-Wernli & Schubert (2001) come to the conclusion in their comprehensive gender-comparative experiments that 'a general stereotype in the sense that women are more risk-averse than men is not directly maintainable [...]. Therefore the "framing" of information is of importance' (Littmann-Wernli & Schubert, 2001). In context-related decision problems, their studies showed that there are no significant differences between men and women as far as willingness to take risks is concerned. In abstract game situations, however, women were more risk-affine when it came to a losing game and more risk-averse when it came to a winning game. In addition, information about probabilities (of success) had different effects on the risk behaviour of women and men; if there was little or no information at hand, women were less willing than men to take risks. The numerous studies based on self-assessments of the willingness to take risks concluding that women have a greater aversion to risk do not take into account that (in accordance with Littmann-Wernli & Schubert, 2001) attitude differences are the result of differences in ambiguity aversion (aversion to uncertain situa-

tions) but not in risk aversion in the narrower sense of the term. Women thus seem to be more sensitive with regard to ambiguity than men. But within specific occupational groups, especially managers or entrepreneurs, empirical studies suggest that women and men are willing to take risks to the same extent. Sonfield et al. (2001), for instance, did not find any gender difference between female and male small firm owners with respect to risk situations or strategies chosen. Earlier studies also found that among managers, women and men 'display similar risk propensity and make decision of equal quality' (Johnson & Powell, 1994) even though among non-managers differences still exist.

If women are generally less willing to take risks than men, and if this self-perception regarding professional career does not concern willingness to take risks in the narrowest sense of the term but, as Littmann-Wernli & Schubert (2001) suspect, reflects ambiguity aversion, then differences between women and men should prove to exist: women, in comparison to men, rate themselves as being more risk-averse (or regard their professional career as more risky). Furthermore, if there are no differences in risk propensity between women and men in leadership positions, the willingness to take risks should matter more for the promotion probability of women than for that of men.

Based on the second hypothesis (risk aversion matters for the promotion probability) this would mean that women's chances of being in a leadership position are much lower due to their attitude towards risk. This leads to the following sub-hypothesis:

H2.1: The effect of risk aversion on the promotion probability is significantly higher for women than for men – in short: risk aversion matters more for women.

3 Data, definitions, and methods

3.1 Data

The results of this study are based on data from the German Socio-Economic Panel (SOEP), 2008 release (1984-2007) (Wagner et al., 2007; Wagner et al., 2008a; Wagner et al., 2008b). The SOEP is a representative longitudinal survey of more than 20,000 persons in about 12,000 private households in Germany. It has been carried out in the Federal Republic of Germany every year since 1984 with the same persons and families. The sample has been amended several times. Partial sample G from 2002, for example, added significant numbers of high-income households.[1] In total, in 2007, data was available on more than 22,000 respondents.

The SOEP provides a platform for examining not only socio-demographic and economic features but also information concerning personality traits and social indicators for a sufficiently high number of cases. On the basis of the SOEP data, analyses have been presented several times on the structure and remuneration of persons in specialist and leadership positions.[2] The units of investigation in our analysis are sala-

1 Households with a net monthly income of approx. €4,000 and above.

2 See, for example Busch & Holst (2009), Holst (2009), Holst & Schimeta (2009), Holst (2006), Holst et al. (2006). The results of these studies differ from the present study not only regarding the definition of the population of leaders but also due to changes/corrections in the projection.

ried employees above 18 years of age in the private sector. The classification of the sector took place based on the question: 'Does the organisation for which you work form part of the civil service? (Yes/No)'. The year 2007 was chosen as the reference date because in this year respondents were asked for the first time whether they supervised others in their job.

3.2 Definition of variables

Dependent variable

Leaders: The target variable is the information on whether or not the respondent was in a leadership position in 2007.[3] 'There are almost as many different definitions of leadership as there are persons who have attempted to define the concept' (Bass, 1990). This statement from the Handbook of Leadership from the year 1990 still applies today. In this study, leaders are defined on the basis of the respondents' specifications on their position in their occupation. Due to the lower proportion of women in high leadership positions (top management), a somewhat broader definition of leaders was selected:

1. functions with extensive managerial duties (e.g. managing director, manager, head of a large firm or concern);
2. other managerial functions or highly qualified duties (e.g. scientist, attorney, head of department) – only if they stated that they supervise others (see Figure 4 in the annex).

The term 'leaders' therefore encompasses both persons in top leadership positions as well as highly-qualified specialists who supervise others. This separation between leaders, that is, employees with extensive managerial duties, and other employees with high levels of qualification and more limited supervisory responsibilities has only been possible since 2007, when the SOEP introduced the question for the first time.[4]

Independent variables – personality measures

Big Five Traits: The surveying of personality dimensions in the SOEP took place in 2005 and is based on the self-assessment of respondents on the basis of 15 adjectives used in colloquial language. The question in the SOEP is: 'Now a completely different subject: our every-day actions are influenced by our basic belief. There is very limited scientific knowledge available on this topic. Below are different qualities that a person can have. You will probably find that some apply to you perfectly and that some do not apply to you at all. With others, you may be somewhere in between. Please answer according to the following scale [...] I see myself as someone who...'. The respondents

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3 For those who had a leadership position in 2007 we do not take into account when they entered this position. If the person did not have a leadership position in 2007, we do not take into account whether he or she might have been in a leadership position before. Since the analysis at hand is a cross-section analysis, we do not take into account whether a person is either going to change to a leadership position (i.e. be promoted) or leave a leadership position (i.e. be demoted) in the future.

4 See Fietze et al. (2009) for similar analyses based on data from 2005, including a much broader definition of leadership.

were given 15 adjectives or statements to evaluate on a scale of 1: 'Does not apply to me at all' to 7: 'Applies to me perfectly' (cf. Figure 5 in the annex). We employed factor analysis to extract from these 15 statements on personality self-perception the five personality dimensions conscientiousness, extraversion, agreeableness, openness, and neuroticism.[5]

Willingness to Take Risks: General and special risk aversion was included in the SOEP in 2004. This information is also based on the respondents' self-assessments, which do not necessarily reflect their true behaviour. It is assumed that respondents' true behavioural patterns deviate from their statements, both due to the fact that self-perceptions differ from individual to individual, and due to social role behaviour. Nonetheless it can be assumed that there is a strong link between the information provided by the respondents about themselves and their actual behaviour. As far as willingness to take risks is concerned, Dohmen et al. (2005) have shown this clearly. Of the total of eight questions dealing with individual risk behaviour in general and in various situations in life (driving, investments, leisure and sports, etc.), this study investigates general willingness to take risks and willingness to take risks with regard to one's own professional career. The corresponding questions in the SOEP are (1) 'How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? ' to be answered by the respondents using a scale ranging from 0: 'risk-averse' to 10: 'fully prepared to take risks' (cf. Figure 6 in the annex); and (2) 'People can behave differently in different situations. How would you rate your willingness to take risks in the following areas? – in your occupation? ' to be answered by the respondents using a scale ranging from 0: 'risk-averse' to 10: 'fully prepared to take risks' (cf. Figure 6 in the annex).

Independent variables – 'controls'

As to personality traits, the aim of the final analysis is to demonstrate the extent to which leaders differ in their self-perception from those who are not in a leadership position. This is examined by 'monitoring' other individual and socio-structural criteria (control variables) such as scope of education, working environment (segregation), social background and family situation. One aim in taking these criteria into account is to show how strongly – in comparison to the personality traits – these criteria are linked to professional position. The other aim is to consider the differences between women and men as regards the scores achieved in these criteria (in particular segregation and professional experience).

Human Capital: Human capital investments explain differences in performance and labour productivity and thus influence professional position (Becker, 1993). Therefore the duration of education, duration of work experience, squared duration of work experience, duration of job tenure – all measured in years - are included as con-

5 In 2005, in the style of the Big Five approach, a brief scale (BFI-S) was used for the first time in the main SOEP survey. The development of this brief scale (three questions were asked for each personality dimension on a scale of 1 to 7) was preceded by a pretest in the year 2004. Regarding validity and reliability, the results were satisfactory (F. Lang et al.2011). The five dimensions were formed using factor analysis of the 15 individual items.

trols in our analysis. In addition, working hours arrangements and any overtime deviating from these arrangements are taken into account by means of contracted working hours (more/less than 35 hours per week) and the number of overtime hours worked during the previous week. It is presumed that a high time commitment to one's occupation is significantly more prevalent to leaders than it is to other employees who are not in leadership positions.[6]

Social Structure and Living Environment: Both aspects might affect the availability on the labour market and therefore also the probability to be in a management position. For this reason, the model includes the variables marital status (married, living together: yes/no), number of children under 16 years of age in the household, and amount of time spent on housework in one working day (none/at least one hour). Since we presume that leaders have a high time commitment to their jobs, we suspect that they do less housework than other white-collar employees. Another explanation could be that higher income gives greater opportunities to outsource housework. Origin or social background can also play an important role in career chances. Children from better educated households are therefore likely to have greater career opportunities than those coming from less educated households (Schneider, 2004; Schneider, 2008). In our analysis, social background is reflected by the father's school education (advanced technical college entrance qualification/university-entrance diploma, less than advanced technical college entrance qualification/no comment).[7] Furthermore, the model includes the region of Eastern Germany (yes/no) as a variable in order to take into account the still-existing differences between the two parts of Germany as regards opportunities to assume a leadership position.

Labour Market Segregation: Large companies have an internal labour market, which makes the chances of promotion to higher positions better than in small and very small companies. The labour market is also segregated according to gender, i.e. there are differences between the sexes when it comes to their hierarchical positioning (vertical segregation) and their dominance in individual economic sectors and occupational areas (horizontal segregation). As a result, typical female occupations are characterised by lower chances of promotion than is the case in typical male occupations (Busch & Holst, 2009). It is a well-known fact that women mainly find employment in the service sector (including health and welfare), whereas men are over-represented in manufacturing (Busch & Holst, 2009; Holst, 2009). It can consequently be assumed that women and men have differing chances of promotion in the respective sectors. Higher chances of promotion can be expected in areas where the employment share is also higher. The assessment for labour market segregation includes the following variables: economic sector (manufacturing trade, commerce, hotel and restaurant industry, transport), company size (under 20, 20 to under 200, 200 to under 2000, more than 2000 employees), and the proportion of women in the occupation (gender-specific labour market segregation).

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6 In a longitudinal study for Germany, Pannenberg (2002) concluded that in the long term overtime goes hand in hand with an increase in actual earnings.

7 Alternatively, the mother's education was taken into account; this, however, had no significant influence.

Technical Controls: In addition, checks are carried out to establish special features in the sample in the SOEP (high income sample G).

3.3 Methods

Differences in Personality Traits: We start by analyzing differences in personality between leaders and other employees by means of bivariate analysis. Results are shown in section 4.1. The average of each dimension of the personality traits (Big Five and willingness to take risks) is presented for all private-sector employees as a deviation from the mean of the adult population – separately for women and men in leadership positions and other employees. All dimensions underwent a standardisation process on a mean value of 50 and a standard deviation of 10 (Nübling et al., 2006). The deviations shown are therefore the difference between the mean values of the personality traits of individual subpopulations and those of the overall population – i.e. including all employed and unemployed persons from the age of 18. The pairwise differences have been statistically tested.

Multivariate Logit Model: In order to test the hypotheses, a multivariate model (section 4.2) is used to calculate the likelihood of being in a leadership position (yes=1) considering the Big Five and willingness to take risks as personality traits as well as other control variables. The estimated marginal effects provide a basis for establishing which traits are characteristic of leaders on average. The calculation is made both for all employees as well as separately for women and men. Additionally an interaction model tests the statistical significance of gender-specific effects. The statistical model is based on a logit analysis (Greene, 1997), i.e. the statistical likelihood of being in a leadership position is estimated by means of various influencing factors.[8]

Decomposition Method: Based on the multivariate estimates, the gender career gap – the difference between women's and men's average likelihood of achieving a leadership position – is explained by means of a non-linear decomposition technique (section 4.3) following Fairlie (2003). The decomposition of the gender career gap will show the extent to which differences in promotion probabilities between women and men are caused by differences in personality compared to differences in other characteristics.

4. Empirical findings

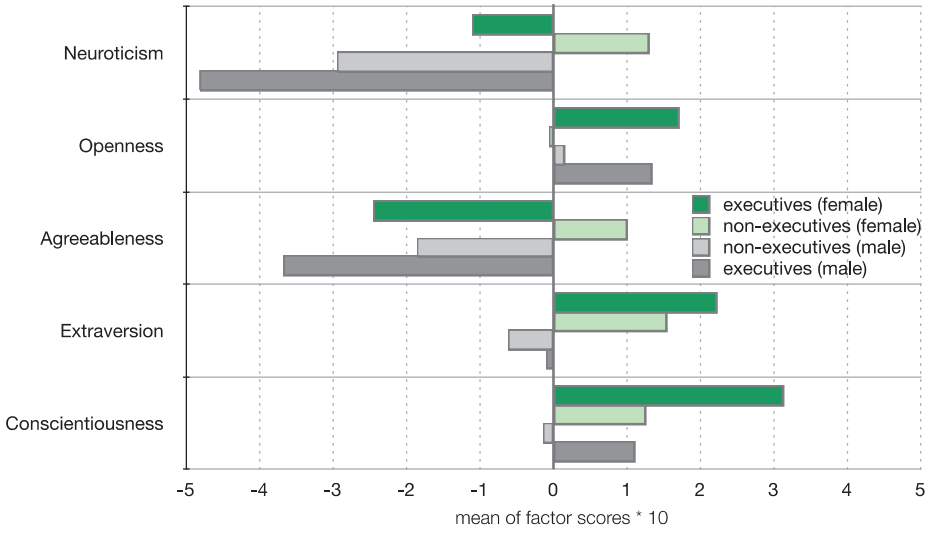
4.1 Descriptive results

An examination of the individual personality traits alone initially reveals that employees from the private sector differ from the mean of the population in most of the dimensions of the Big Five construct (Figure 1). Their statements often reveal lower neuroticism values – i.e. higher emotional stability – and cover agreeableness and higher values in the openness, extraversion and conscientiousness dimensions. These traits are more pronounced in leaders, who in our study are characterised as emotionally more stable, more open, more conscientious and less agreeable than non-leaders. The extraversion dimension, however, seems to play different roles for women and

8 The cross-sectional analysis does not enable any cause-effect statements to be made. For this purpose, a time-span-related analysis is necessary.

men: women specify much higher values than men. However differences in the self-assessment of extraversion between leaders and non-leaders are not statistically significant, for either women or men. As a general rule, the greatest differences between the sexes with regard to occupational status are found in the neuroticism and agreeability dimensions.

Figure 1: Big Five personality traits of leaders and other employees in the private sector in Germany in 2007 according to gender (average deviation from the overall mean of all adult persons)



Source: SOEP, own calculations.

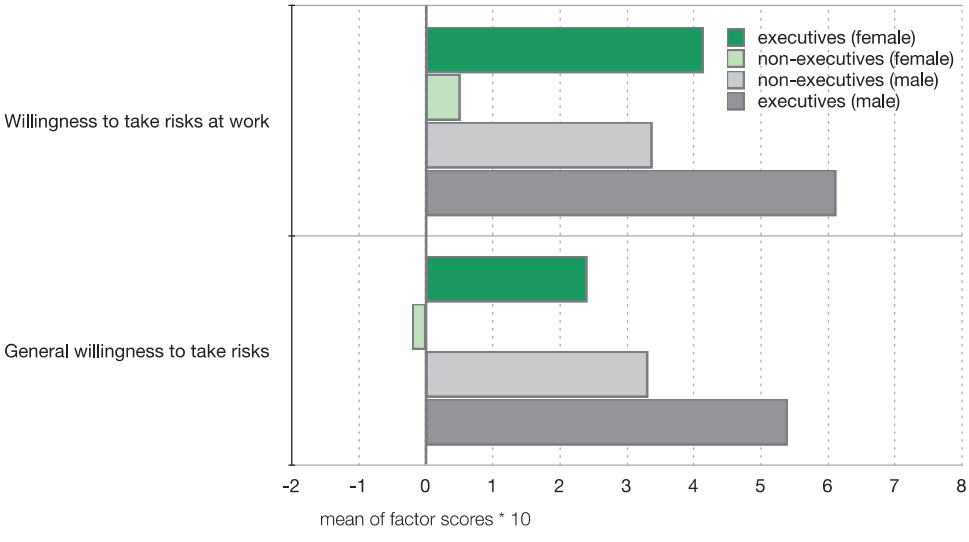
Openness to experience seems to be a particularly important personality trait in leaders: Mueller & Plug (2006), for example, revealed in a longitudinal study that – in comparison to the other four dimensions of the Big Five construct – this dimension has the greatest positive influence on income. Our analysis also shows that leaders and non-leaders differ significantly with regard to their self-reported openness. Although women in leading positions reveal higher values than men in this dimension, this difference is not statistically significant. Nevertheless, women in leadership positions see themselves as more extroverted and more conscientious than men do. Men in leadership positions, on the other hand, consider themselves to be more emotionally stable and less agreeable than women, albeit the latter is not statistically significant. As a result, female leaders score high in two of the five traits in which leaders may differ from non-leaders, whereas men score high (low in neuroticism) in one of them. We found no statistically significant difference between women and men in leadership positions in the two dimensions openness and agreeableness. Extraversion does not seem to play a significant role for leaders at all.

In addition to the Big Five personality traits, differences in willingness to take risks also exist between leaders and non-leaders and between women and men. As far as willingness to take risks to one's own career and general willingness to take risks are

concerned, employees are, on average, more willing to take risks than the population mean, whereas leaders are more willing to take risks than other employees in the private sector (Figure 2). On average, men give generally higher values for willingness to take risks than women. Female leaders, however, are on a par with non-leader male employees when it comes to willingness to take risks at work.

To sum these results up: We do find evidence that leaders and non-leaders differ in their personality, except in the extraversion dimension. Both with regard to the Big Five and willingness to take risks, it is evident that women in leadership positions differ more from their female colleagues who are not in a leadership position than is the case with men. The difference between leaders and non-leaders regarding the personality dimensions considered are much greater for women than for men. This suggests that personality may play a greater role in women's career chances. Initially, this result could be interpreted as evidence of the strong pressure on women to adapt if they want to be successful in the 'male-dominated world'. Finally this bivariate analysis also shows that women and men differ in most personality dimensions regardless of being in a leadership position or not.

Figure 2: Willingness to take risks of leaders and other employees in the private sector in Germany in 2007 according to gender (average deviation from the overall average of all adult persons)



Source: SOEP, own calculations.

4.2 Multivariate analyses

In the multivariate logit model, we include both personality traits and other characteristics of employees in order to estimate the effects on the promotion probability. The aim is to investigate which factors are significant for the probability to be in a leadership position. The dimensions taken into account are those specified in section 3.2 concerning human capital investments, social structure, living environment, and gen-

der-specific segregation in the labour market in Germany (Model 1). In Model 1, gender is only incorporated as a dummy variable (woman = 1, man = 0). Subsequently, this assessment is carried out separately for women and men in order to estimate the influence of characteristics on career advancement (Models 1a and 1b) within these subpopulations. A concluding analysis that takes into account interaction of variables[9] is carried out to show potential gender differences in the effect size of the personality indicators and other characteristics (Model 2).

Table 2: Effects of personality on the promotion probability for employees in the private sector in Germany in 2007 (marginal effects from logit analyses)

	Marginal effects			Significant
	All	**Women**	**Men**	**differences**
	Model 1	Model 1a	Model 1b	Model 2
Personality				
'Big Five'				
Neuroticism	-0.017 **	-0.003	-0.039 **	n.s.
Openness	0.015 **	0.006	0.027	n.s
Agreeableness	-0.014 **	-0.007 *	-0.021	n.s
Extraversion	0.007	0.001	-0.019	n.s
Consciousness	0.020 ***	0.006	0.039 **	n.s
Willingness to take risk (job career)	0.042 ***	0.010 **	0.096 ***	n.s
Monitored for further explanatory variables:				
Woman *(Reference: man)*	-0.068 ***			
Constant	-0.721 ***	-0.235 ***	-1.433 ***	
Number of cases	2,883	1,557	1,326	
Log likelihood	-1,038.1	-313.7	-705.8	
LR	578.8 ***	87.0 ***	253.9 ***	
Pseudo R^2	0.3302	0.3096	0.2075	
Full set of control variables included	yes	yes	yes	yes
(presented in section 3.2)				

* significant at 10%; ** significant at 5%; *** significant at 1%

n.s. the effect does not differ significantly between women and men

Dependent variable: achieved a leadership position (yes/no); controlled for sample G.

Source: SOEP, all employees in the private sector in Germany in 2007 (own calculations).

Table 2 shows the marginal effects of personality traits on the promotion probability for employees in the German private sector when controlling for all other characteristics mentioned above.[10] The marginal effects enable us to establish which traits are

9 That means the interaction of being female with all other variables considered.

10 For a full table, see Table 3 in the annex.

characteristic of leaders on average, taking into account that leaders may be women or men. Marginal effects reflect the impact on the dependent variable and enable us to make a direct comparison between the magnitudes of impact for the variables – in each case within the metric and categorical variables. In this logit analysis, the marginal effect of a metric variable corresponds to the change in the probability of being in a leadership position if this variable increases certeris paribus by one unit. The promotion probability increases, for example, by 2.0 percentage points if a person is (or perceives herself) to be one unit[11] more conscientious than the average of all employees. For categorical variables (e.g. being a woman), the marginal effect is the change of probability of being in a leadership position in comparison with the reference group. In this case, the probability of being in a leadership position is on average 6.8 percentage points lower for women than for men.

Model 1 confirms previous results for the personality traits neuroticism, openness, agreeableness, and conscientiousness: The probability of being in a leadership position is greater for employees who are emotionally more stable (or less neurotic), more open to experience, less agreeable, and more conscientious, whereby the influence of the latter dimensions is the most prominent. In comparison to the other (control) variables, however, their impact tends to be low (see Table 3 in the annex). In contrast, the most prominent dimension is willingness to take risks in one's career[12], for which – while controlling for other characteristics – leaders are more willing to take risks in their professional careers than non-leaders. In statistical terms, the promotion probability increases ceteris paribus by 4.2 percentage points when a person evaluates him- or herself as one unit[13] more willing to take risks than the average of all employees in the private sector. This makes the effect relatively high. As far as conscientiousness and openness are concerned, an equivalent change is less than half of this amount (2.0 and 1.5 percentage points, respectively). The results therefore confirm the findings from other studies, which showed that the relationship between the Big Five personality traits and leadership tends to be low in magnitude. In contrast to other studies, no statistically significant effect can be found for the extraversion dimension.

This model was also assessed separately for women and men (Models 1a and 1b). As can be seen, women can increase their probability of being in a leadership position through less agreeableness (statistically weak significance); for men, conscientiousness and emotional stability (lower neuroticism value) play a role. For both sexes, willingness to take risks in one's career has the largest impact.

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11 One 'unit' corresponds in this variable (as with all dimensions of the Big Five) to one standard deviation, because of standardisation.

12 The model was also expanded to include general willingness to take risks. This, however, contributed no added explanatory value and did not reveal any significant effects for women or men. In addition, there is a greater connection with willingness to take risks in one's professional career.

13 One 'unit' corresponds in this variable (as with the Big Five, because the variables were standardised or transformed) to a standard deviation. If a person deviates with regard to this variable by one standard deviation from the mean value, this difference must be evaluated as very prominent.

In order to test whether these different traits influence career advancement, it was also examined whether women in leadership positions differ more in these traits from non-leaders of their own sex than is the case among men (Model 2).[14] The significant differences between women and men in this extended model are indicated in the last two columns. It is apparent that the chances women and men have of being in a leadership position do not differ significantly in statistical terms as regards the personality traits if both have had the same education and professional experience, have a similar social background and family situation, and are in the same sector, in a similar job, and have identical working hours.

As a result, hypothesis H1 cannot be rejected except for extraversion, where we do not find statistical differences between leaders and non-leaders. Also hypothesis H2 cannot be rejected. Leaders in the German private sector are more willing to take risks, more conscientious, more open to experience, less agreeable, and less neurotic. This means, that personality matters, but not much, since other objective characteristics affect career chances much more strongly than the comparison of the marginal effects showed. Regarding gender-specific influences of personality traits on career opportunities, we can reject both sub-hypotheses H1.1 and H2.1 that personality matters more for women. We do not find any statistically significant differences in the effects of personality traits of women and men when we control for other characteristics. This means that women and men have the same likelihood of achieving a leadership position with respect to personality if all other characteristics (human capital, social structure, life environment and segregation) are equal.

4.3 Explaining the gender career gap

In the previous sections we have investigated the impact of personality traits on career chances. We have also tested whether or not there are different effects (in significance and magnitude) for women and men, but we are left with the question of why women have lower chances of reaching management level than men. Therefore we will decompose the gender career gap into an explained and an unexplained part. When explaining the gender pay gap, the Blinder-Oaxaca decomposition technique is often used in order to differentiate between price and endowment effects (Busch & Holst, 2009). For the endowment effect this decomposition technique can also be used to identify those characteristics in which the two groups (namely women and men) differ the most. Fairlie (2003) adapted the Blinder-Oaxaca decomposition to non-linear functions as is the case in our analyses, where the dependent variable is a dummy variable (0=non-leaders, 1=leaders). By means of Fairlie's method, we can identify, based on our estimations presented in the previous section, the gender career gap and its sources.

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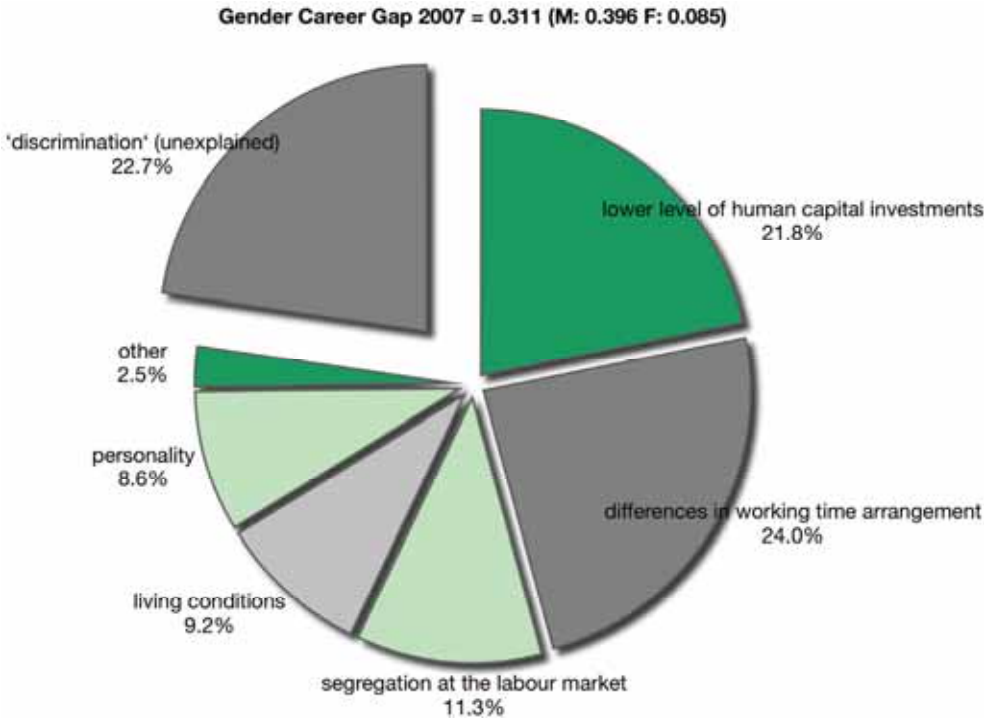
[14] Interaction effects in non-linerar estimations are not linear and thus are probably significant only for certain sub-populations even if the marginal effect is not significant on average or vice versa. Therefore we tested all interactions of variables using the 'inteff' program in Stata, as proposed by Norto (2004). Detailed results for those interaction terms that are significant within a certain range of the predicted probability of the dependent variable, are shown in the annex (Figures 7 – 20).

In our sample, 39.5 percent of the male white-collar employees in the private sector are in a leadership position whereas only 8.5 percent of their female counterparts are. This results in a gender career gap of 0.31 or 31 percent (39.5 minus 8.5). 77.3 percent of this career gap, which is the difference in the average promotion probability between women and men, can be explained by different endowments in women and men (Figure 3).[15] This means that more than three-fourths of the gender career gap are caused by different endowments.

Figure 3: Non-linear Blinder-Oaxaca decomposition as proposed by Fairlie (2003) of the gender career gap for white-collar employees in the private sector in Germany in 2007 (explained proportion in percent)



Source: SOEP, own calculations.

Almost one fourth of the career chance inequality between women and men is due to differences in working time arrangements – women work part-time if childcare options are limited or non-existent, which in turn lowers their chance of climbing the career ladder. More than 20 percent of the gender career gap is caused by lower levels of human capital investments by women. This is mainly due to less work experience because of discontinuous work histories of women. Women experience career interruptions because of child-bearing and maternity leave and therefore have less work experience – furthermore their accumulated work experience will be devalued if the in-

15 The remaining 22.7 percent of this gap include price effects and unobserved differences or treatments (often called discrimination).

terruption is too long (Beblo & Wolf, 2002). The remaining 31.6 percent of the gender career gap can be traced back to segregation in the labour market, living conditions, personality, and other (sample specific) control variables. Nonetheless, differences in self-reported personality traits can explain 8.6 percent of the gender career gap, which is mainly due to differences in risk aversion regarding one's career. Consequently, even though risk aversion does not matter more for women (hypothesis H2.1 was rejected based on our estimation results in the previous section), women's lower risk propensity goes hand in hand with lower chances of career advancement, but this accounts for less than 10 percent of the overall gender career gap. Differences in human capital investments and working time arrangements – especially less work experience and part time work – is much more crucial in delimiting women's career opportunities.

5. Conclusion

The aim of our study was to compare the self-evaluation of personality traits (Big Five and willingness to take risks) of leaders and other employees in the private sector in Germany and to determine the extent to which women and men differ. The study also aimed at clarifying whether, due to other characteristics, the personality traits concerned had a statistically significant influence on the different promotion probabilities of women and men. By means of sophisticated psychological constructs, well established measures of personality, and a large-scale dataset our results contribute to the discussion of the importance of non-cognitive skills on career advancement. We also shed light on the gender career gap, which has not been explained in quantitative research so far.

A bivariate analysis of personality self-evaluations revealed that in most of the personality dimensions, leaders differ significantly from employees who are not in a leadership position. In our study, leaders are emotionally more stable, more open to new experiences, more conscientious, and less agreeable than other employees. Differences also become evident when looking separately at women and men. Generally, women rate themselves as more open, more extroverted, and more conscientious than men. Men, on the other hand, give higher values for willingness to take risks and emotional stability and lower values for agreeableness. With regard to some personality traits, women in leadership positions differ far more significantly from other women with no leadership function than is the case with men. This suggests that women are under pressure to adapt to the male-dominated leadership world.

If the influence of personality traits is examined in consideration of further factors such as human capital endowment, labour market segregation, social background, and individual living environment, the differences between the sexes as explanatory factors for professional success assume a less important role. Although the conscientiousness, openness to experience, emotional stability (or neuroticism), agreeableness, and willingness to take risks dimensions still have a certain explanatory capacity for career advancement, they cannot explain the gender career gap to a large extent.

The first hypothesis (H1) proposed in Section 2.1 cannot be rejected: except for the personality dimension extraversion, persons in managerial positions do differ significantly in their self-perceptions from employees who are not in such positions. We do find evidence that leaders are more conscientious, more open to experience, less

agreeable, and less neurotic, and rate themselves as more willing to take risks in their professional careers than non-leaders do. But these differences are low in magnitude. We also did not find gender-specific differences, and therefore conclusively rejected the sub-hypothesis (H1.1), which claimed that personality matters more for women. The second hypothesis (H2) claimed that leaders are more willing to take risks than non-leaders. Based on our empirical results, it also cannot be rejected. The results from multivariate analyses reveal that willingness to take risks has a clear influence on the promotion probability. The impact was even stronger than for any of the Big Five dimensions, although it did not differ in statistical terms between women and men – therefore the sub-hypothesis (H2.1) that risk aversion matters more for women had to be rejected. But the decomposition of the gender career gap clearly shows that differences in personality, especially in the willingness to take risks for one's own career, can partially explain the gender career gap, but only to a minor extent.

In conclusion, if we compare leaders and other white-collar employees in the private sector in Germany, personality matters. But these differences are low in magnitude, as previous studies have also shown. We found no evidence that non-cognitive skills matter more for women than for men. Differences in personality traits between the sexes merely explain the gender career gap. However, it is not possible to conclude from this that women are not disadvantaged due to their actual or attributed characteristics. Kay (2007), for example, comes to the conclusion that the sex of the person who makes a selection decision is of major significance. In addition, stereotypes of traits and abilities attributed to women do not correspond to those viewed by (male) leaders as absolutely essential for advancing to a leadership position (German Consulting Group, 2005; Gmür, 2006; Gmür, 1997).

Implications for research and practice can be derived from our findings on the connection among personality, gender, and career. We proved that it is not gender differences in personality self-perceptions but other influences that are decisive in determining the different opportunities women and men have of assuming a leadership position. These are, for example, professional experience, social background, and labour market segregation. A one-sided focus on leadership characteristics or personality to explain gender-specific differences between women and men in their professional careers is therefore misleading. More decisive than personality traits for increasing the career chances of women are fewer interruptions in employment (e.g. by extending childcare options) and a decrease in labour market segregation. The right combination of conditions in the social, political, and economic environment can contribute towards equal opportunities, allowing both women and men to be able to make these important professional investments.

Stereotypical attributions of abilities and traits can damage businesses and other organisations. A considerable amount of research still needs to be done concerning the losses resulting from this. Top leaders in particular are often recruited from their own ranks. For the most part, no research has been carried out in quantitative analyses on the influence of network effects on the different career chances of women and men. To support gender-neutral conditions in companies, intensive training courses for decision makers and targeted incentive systems can contribute to achieving higher female proportions in the leadership sector.

When considering which personality differences this analysis reveals between leaders and non-leaders, it must be borne in mind that we are dealing with a snapshot of the achieved professional status, which results from both internal and external selection processes. With the self-perceptions of personality traits, this might be reinforced or weakened by the particular professional situation. Nonetheless it would be worth contrasting our results from the first quantitative analysis of the gender career gap in Germany with representative data from other countries. The British Household Panel Study (BHPS) could be used, because the same psychological measures are included in the questionnaire. A longitudinal analysis is also needed to contribute to the discussion of the stability of personality traits over time and their interrelationship with career advancement. Our investigation is only a first step toward understanding the role of non-cognitive skills in the achievment of a leadership position. Women still face barriers if they want to become a member of Germany's executive boards, but our empirical findings suggest that with respect to personality, Germany's next Top Manager does not necessarily need to be a man – women have got what it takes.

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Annex

Figure 4: Question on supervising others in the SOEP

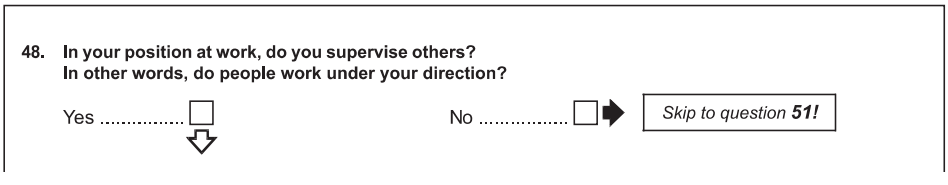

Figure 5: Question on the 'Big Five' personality traits (excerpt from the SOEP survey 2005)

What kind of personality do you have?

125. Now a completely different subject: our every-day actions are influenced by our basic belief. There is very limited scientific knowledge available on this topic.

Below are different qualities that a person can have.
You will probably find that some apply to you perfectly and that some do not apply to you at all.
With others, you may be somewhere in between.

☞ *Please answer according to the following scale:*
1 means ***"does not apply to me at all",***
7 means ***"applies to me perfectly".***
With values between 1 and 7, you can express where you lie between these two extremes..

I see myself as someone who ...	**Does not apply to me at all** 1	2	3	4	5	6	**Applies to me perfectly** 7
– does a thorough job	☐	☐	☐	☐	☐	☐	☐
– is communicative, talkative	☐	☐	☐	☐	☐	☐	☐
– is sometimes somewhat rude to others	☐	☐	☐	☐	☐	☐	☐
– is original, comes up with new ideas	☐	☐	☐	☐	☐	☐	☐
– worries a lot	☐	☐	☐	☐	☐	☐	☐
– has a forgiving nature	☐	☐	☐	☐	☐	☐	☐
– tends to be lazy	☐	☐	☐	☐	☐	☐	☐
– is outgoing, sociable	☐	☐	☐	☐	☐	☐	☐
– values artistic experiences	☐	☐	☐	☐	☐	☐	☐
– gets nervous easily	☐	☐	☐	☐	☐	☐	☐
– does things effectively and efficiently	☐	☐	☐	☐	☐	☐	☐
– is reserved	☐	☐	☐	☐	☐	☐	☐
– is considerate and kind to others	☐	☐	☐	☐	☐	☐	☐
– has an active imagination	☐	☐	☐	☐	☐	☐	☐
– is relaxed, handles stress well	☐	☐	☐	☐	☐	☐	☐

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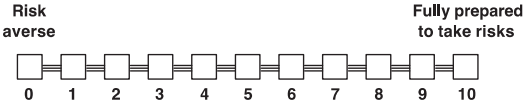
Figure 6: Question on the willingness to take risks (excerpt from the SOEP questionnaire 2004)

119. How do you see yourself:
Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?

☞ *Please tick a box on the scale, where the value **0** means: **"risk averse"** and the value **10** means: **"fully prepared to take risks"**. You can use the values in between to make your estimate.*



120. People can behave differently in different situations.
How would you rate your willingness to take risks in the following areas?

☞ *Please tick a box in each line of the scale!*

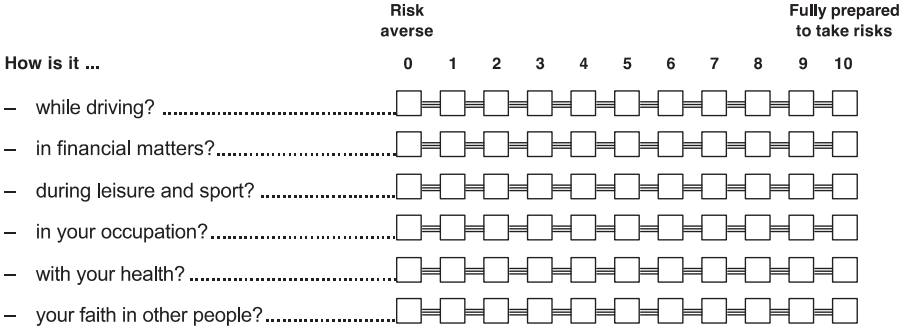


Table 3: Determinants of selection to a leadership position for employees in the private sector in Germany in 2007 (marginal effects from logit analyses)

	Marginal effects			Significant differences
	All	**Women**	**Men**	
	Model 1	Model 1a	Model 1b	Model 2
Personality				
'Big Five'				
Neuroticism	-0.017**	-0.003	-0.039**	
Openness	0.015**	0.006	0.027	
Agreeableness	-0.014**	-0.007*	-0.021	
Extraversion	0.007	0.001	-0.019	
Consciousness	0.020***	0.006	0.039**	
Willingness to take risk (job career)	0.042***	0.010**	0.096***	
Monitored for further explanatory variables:				
Woman *(Reference: man)*	-0.068***			
Human capital				
Duration of education (in years)	0.030***	0.008***	0.060***	
Duration of work experience (in years)	0.007***	0.003**	0.015	
Duration of work experience\s\up6(2)	-0.000	-0.000*	-0.000	
Duration of job tenure (in years)	0.001	0.001	0.000	
Contracted working hours *(reference: part-time)*				
More than 35 hours per week (full-time)	0.109***	0.034***	0.178*	
Amount of overtime (previous week)	0.010***	0.005***	0.019***	+*
no answer regarding overtime	0.038	0.025	0.032	

* significant at 10%; ** significant at 5%; *** significant at 1%
\+ the effect is significantly higher for women than for men
\- the effect is significantly lower for women than for men

	Marginal effects		
	All	**Women**	**Men**
	Model 1	Model 1a	Model 1b
Social structure/Life environment			
Father's school education *(reference: less than advanced technical college entrance qualification/university-entrance diploma)*			
Advanced technical college entrance qualification/university-entrance diploma	0.028*	0.022**	0.018
Don't know/no entry	-0.046*	-0.022	-0.080
Marital status *(reference: married, living apart/not married)*			
Married, living together	0.004	-0.001	0.027
Number of children under 16 years of age in the household	0.023***	0.012**	0.039**
Housework during a working day *(reference: zero hours)*			
At least one hour	-0.032**	-0.009	-0.070**
Place of residence *(reference: former federal states)*			
New federal states	-0.035**	0.002	-0.109***
Segregation			
Economic sector *(reference: manufacturing trade)*			
Trade, hotel and restaurant industry, transport	0.016	0.024**	-0.026
Other services	0.009	0.011	-0.010
Company size *(reference: fewer than 20 employees)*			
20 to up to 200 employees	0.023	0.005	0.043
200 to up to 2000 employees	-0.006	-0.004	-0.023
2000 and more employees	-0.007	0.002	-0.039
Proportion of women in the profession	-0.002***	-0.001***	-0.002***
Constant	-0.721***	-0.235***	-1.433***
Number of cases	2,883	1,557	1,326
log Likelihood	-1,038.1	-313.7	-705.8
LR	578.8***	87.0***	253.9***
Pseudo R^2	0.3302	0.3096	0.2075

* significant at 10%; ** significant at 5%; *** significant at 1%
\+ the effect is significantly higher for women than for men
\- the effect is significantly lower for women than for men
Dependent variable: achieved a leadership position (yes/no); controlled for sample G.

Figure 7: Interaction effects (risk & gender) after logit

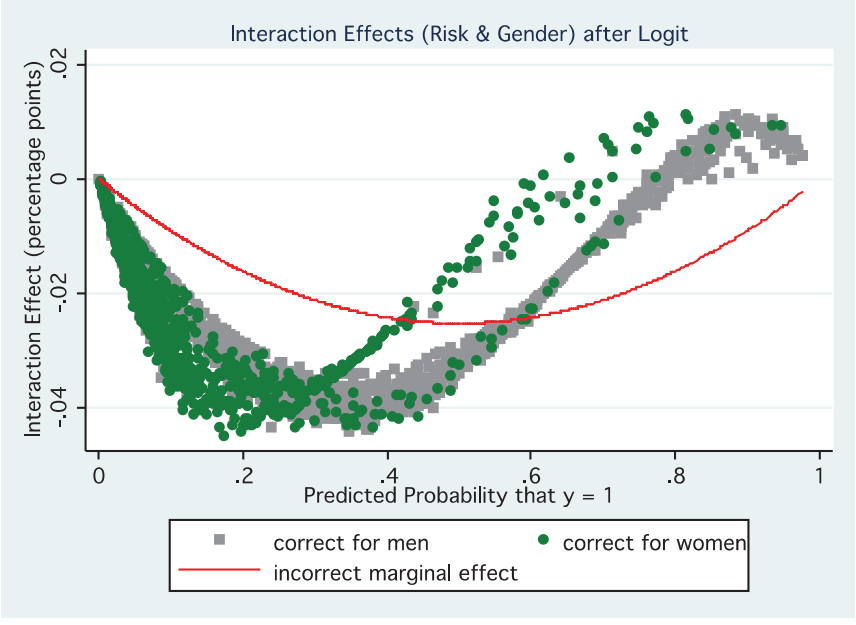


Figure 8: z-statistics of interaction effects (risk & gender) after logit

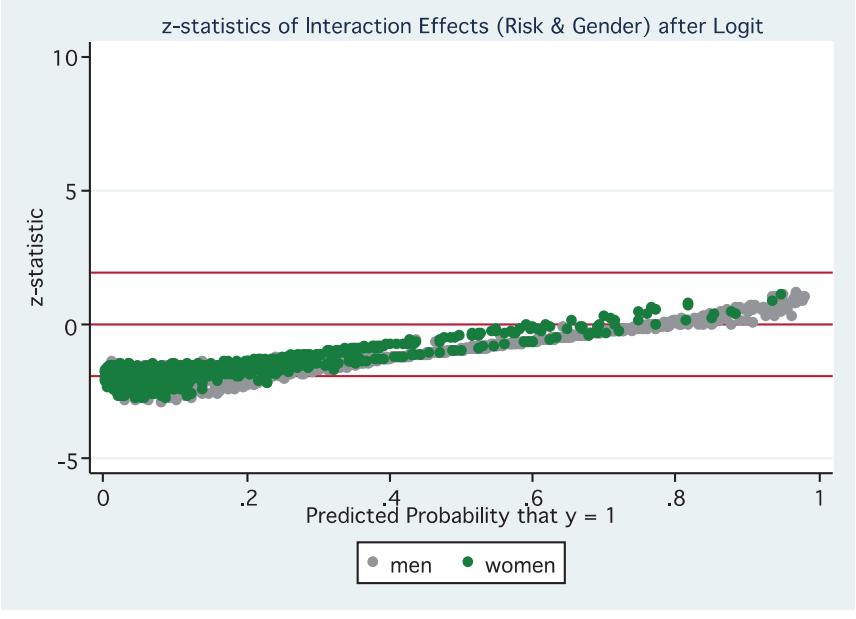


Figure 9: Interaction effects (education & gender) after logit

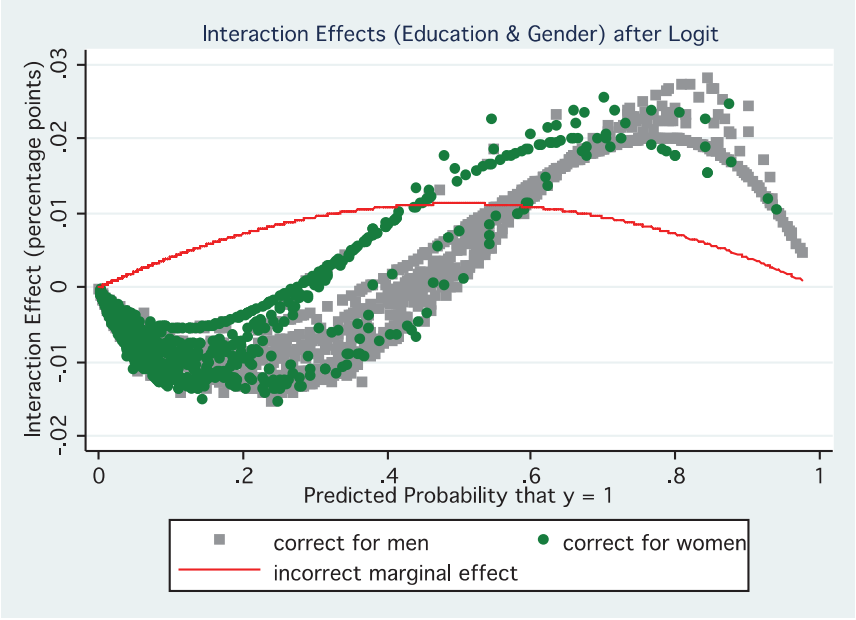


Figure 10: z-statistics of interaction effects (education & gender) after logit

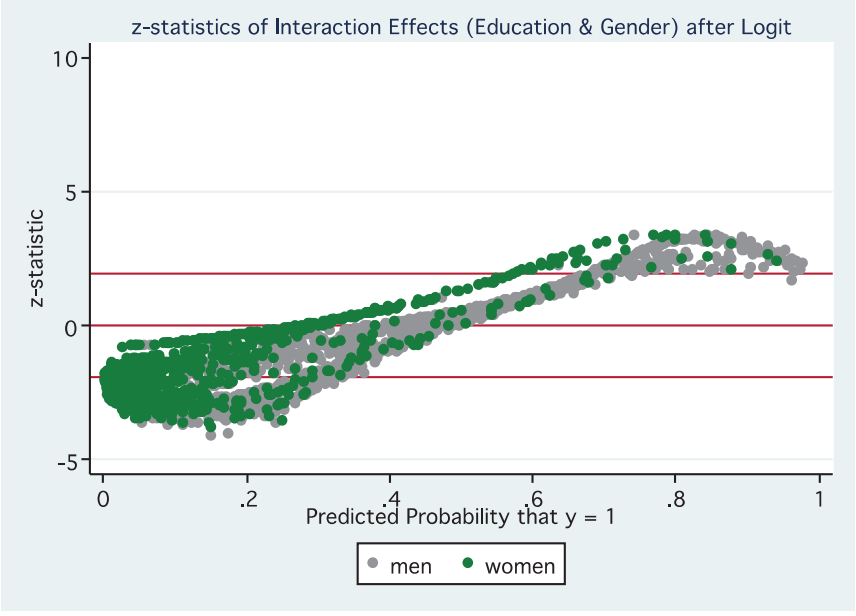


Figure 11: Interaction effects (experience & gender) after logit

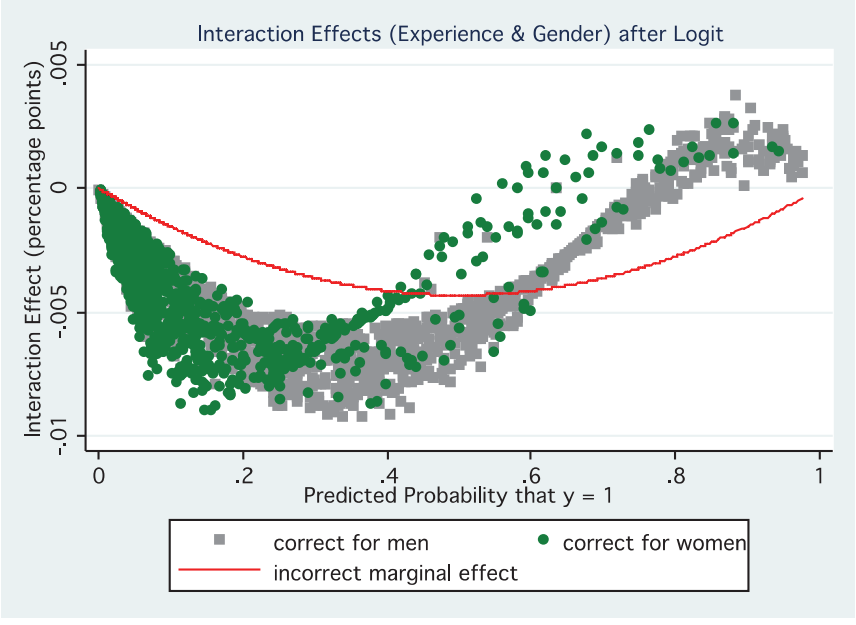


Figure 12: z-statistics of interaction effects (experience & gender) after logit

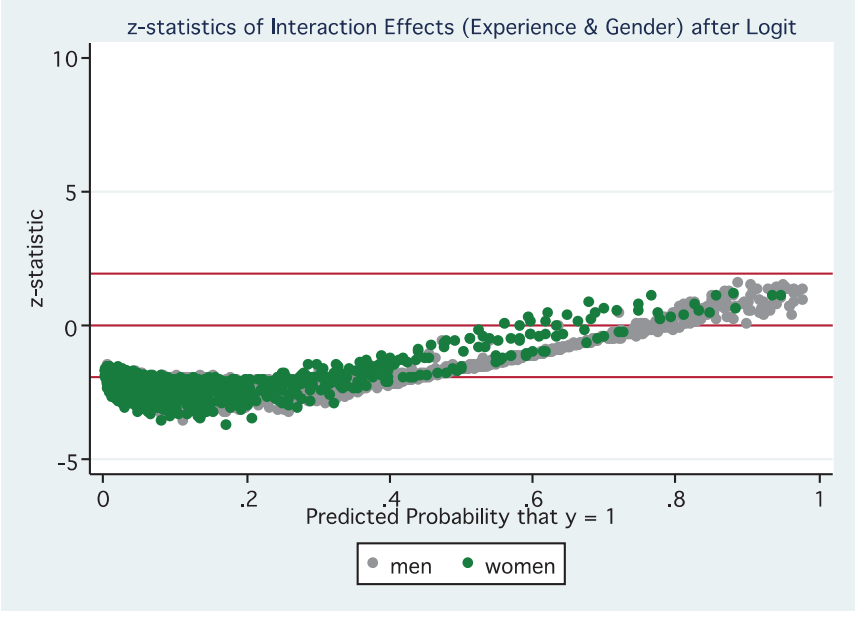


Figure 13: Interaction effects (overtime & gender) after logit

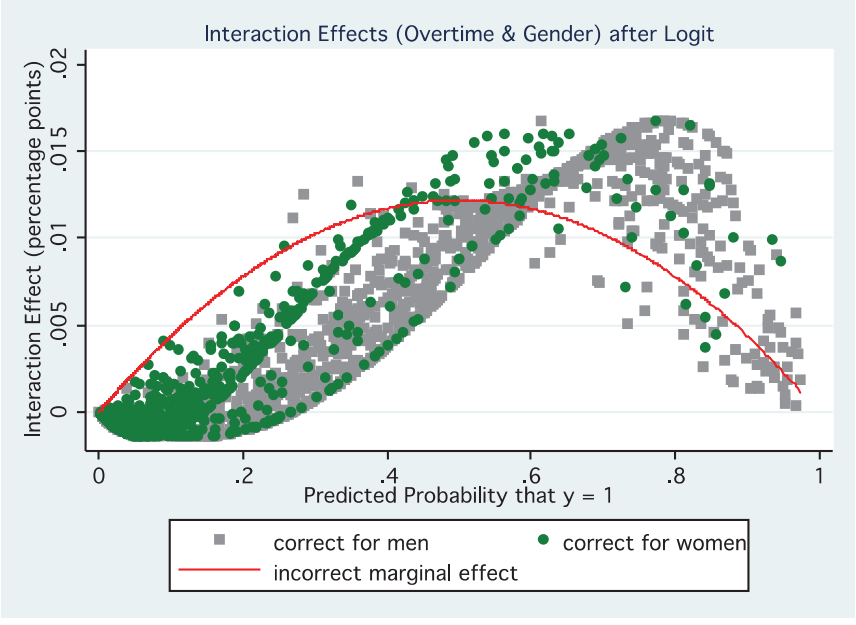


Figure 14: z-statistics of interaction effects (overtime & gender) after logit

Figure 15: Interaction effects (father's education & gender) after logit

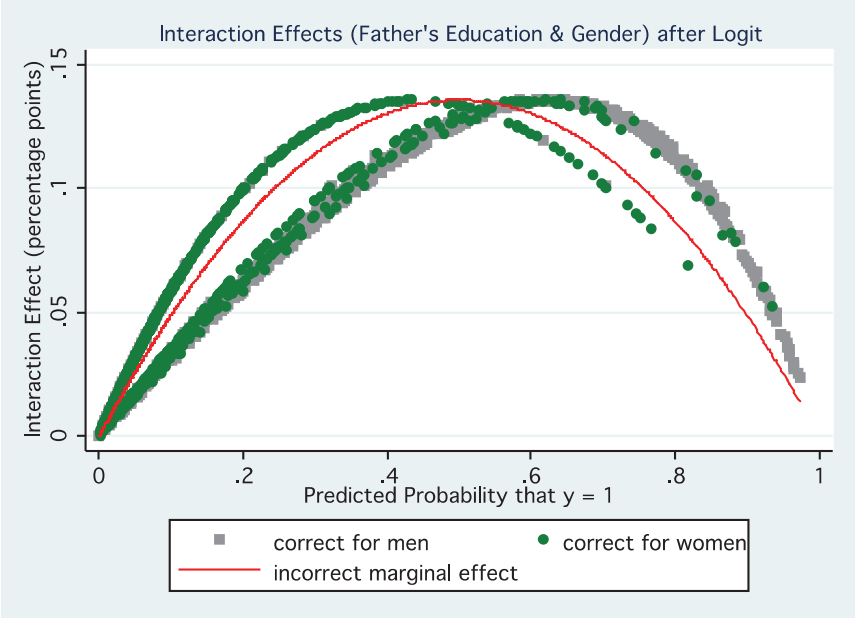


Figure 16: z-statistics of interaction effects (father's education & gender) after logit

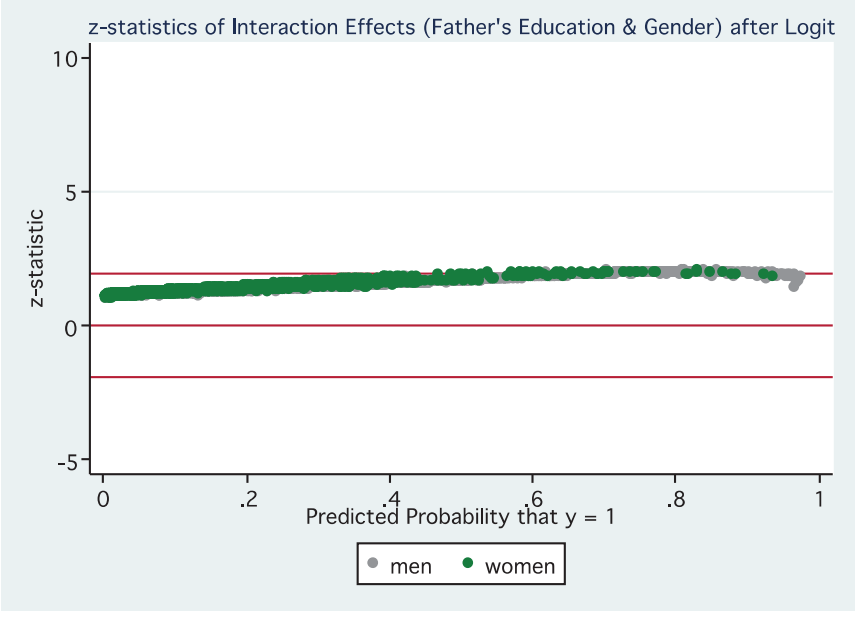


Figure 17: Interaction effects (number of children & gender) after logit

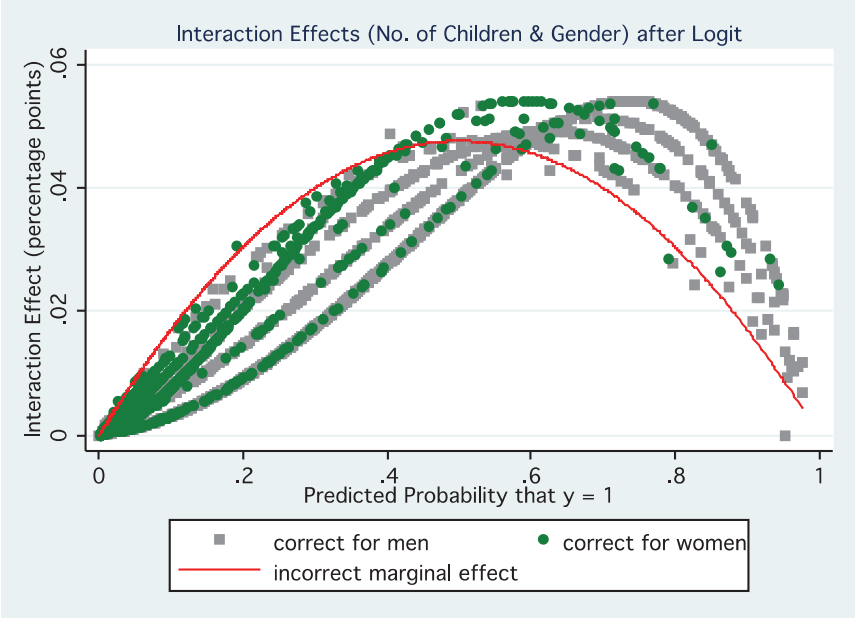


Figure 18: z-statistics of interaction effects (number of children & gender) after logit

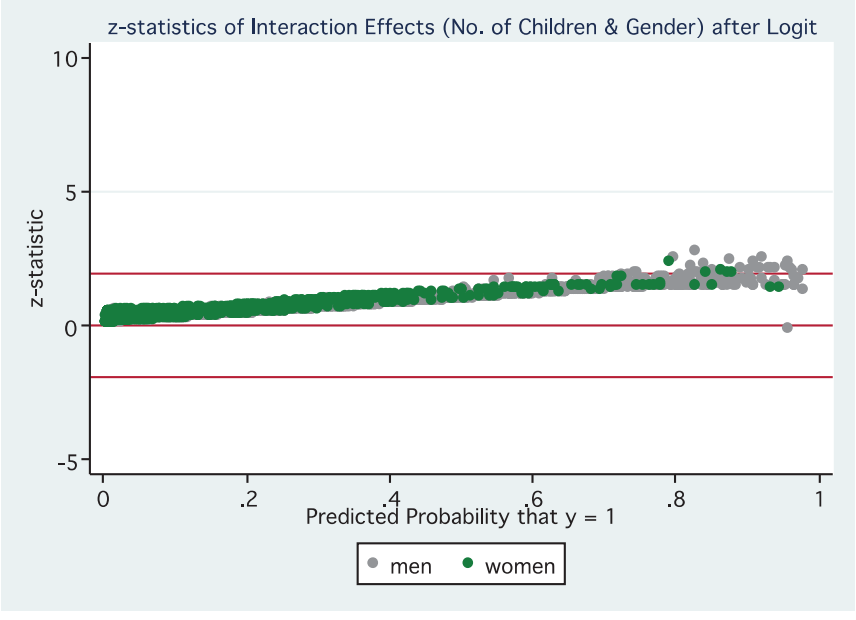


Figure 19: Interaction effects (segregation by occupation & gender) after logit

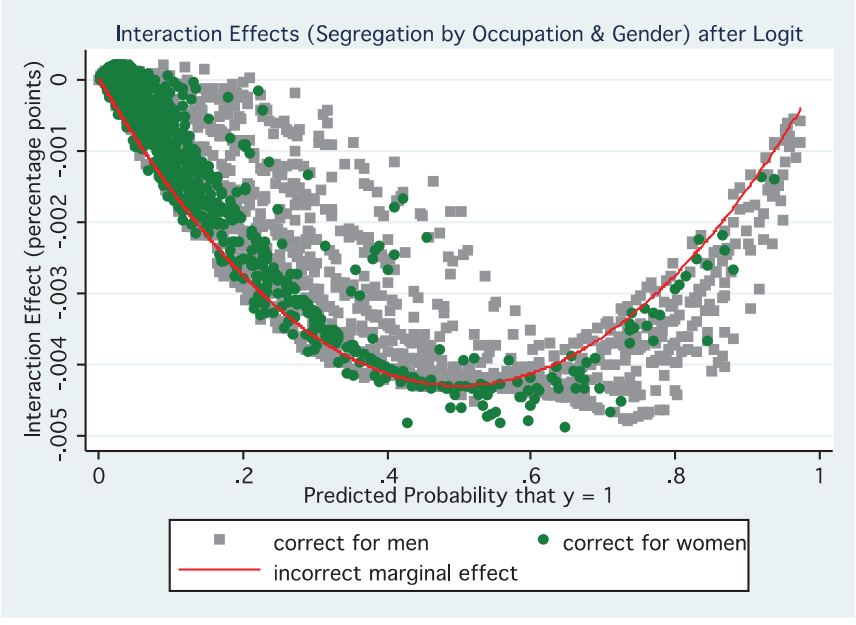


Figure 20: z-statistics of interaction effects (segregation by occupation & gender) after logit