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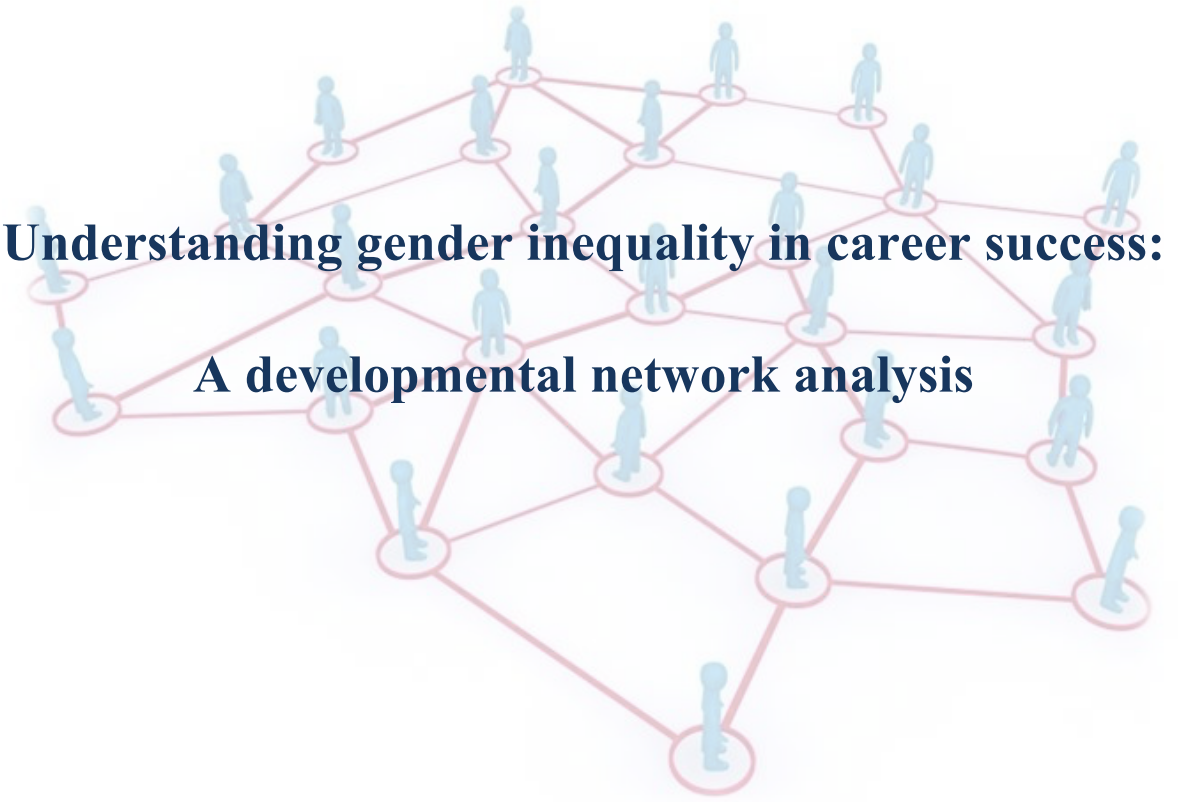

Understanding gender inequality in career success:

A developmental network analysis

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Abstract

Purpose: The purpose of this study is to explore the differences in the structure and content of men's and women's developmental networks. Thereby the study aims to gain insights on why men are often still more successful than women, although qualified and ambitious female professionals are increasingly entering the business world.

Design/ methodology: A network analysis was conducted with 282 Dutch and German working professionals via an online survey. The analysis mapped respondents' developmental network structures and thus investigated gender differences in the network size (total number of developers), diversity (degree to which these developers stem from different social sources) and multiplexity (variety and type of support provided per developer).

Results: The results indicate that women build bigger networks than men, especially outside the organization. On these outside networks they also placed more importance than men while displaying a higher diversity here. Moreover, this study revealed that men only consider an extremely small amount of women their developers while women receive support from both male and female developers. In addition, women proved to receive more psychosocial support than men. In terms of developers from higher hierarchical levels and different organizational departments as well as in terms of the amount of career and role modeling support men and women did however not show statistically significant differences.

Implications/ Conclusions: The fact that men rarely consider women as their developers implies that many men do still not view women as an equal partner in the corporate world. Because of the high need for professionals in today's economy, organizations and politicians need to change this attitude towards more value and acceptance for female professionals, for example by highlighting women's success stories as well as by offering flexible work schedules and job-sharing in board and management positions. Moreover, although women proved to have bigger developmental networks than men, they are not necessarily advantaged. Their strong focus on developers from outside the organization can encourage their career and life satisfaction, but likely hampers their advancement to higher positions inside the organization, for outside developers do not possess organizational information and resources.

Keywords: mentoring support, developmental networks, gender, career success

Table of contents

Introduction **4**

Theoretical background **6**

From mentoring dyads to developmental networks 6

Gender differences 7

Developmental network structures 9

Method **15**

Research Design 15

Sampling procedure 16

Sample 17

Procedure 17

Measures 17

Control variables 19

Results **23**

Network size 23

Network diversity 24

Network multiplexity 28

Discussion **31**

Practical Implications **33**

Limitations and future research **35**

Conclusion **36**

References **38**

APPENDIX A: MEASURMENT ITEMS **43**

APPENDIX B: QUESTIONNAIRE **45**

Introduction

"No country in the world has yet achieved gender equality" (World Economic Forum, in Ebert, Steffens, & Kroth, 2014, p. 359). A large number of countries emphasize the equal rights of every person, but still many people perceive a big gap between the position of men and women in society, especially in the working environment (Abalkhail & Allan, 2014; Ebert et al., 2014; TNS Emnid, 2016). Women not anymore devote their life completely to housekeeping and childcare, but do also increasingly seek an academic and professional career (Davidson & Burke, 2011; Stahlberg, Dickenberger, & Szillis, 2009). Nevertheless, although more and more female professionals have been entering the job market with ambitious career goals in the last years, it seems to be easier for men than for women to move up the corporate ladder and top management and leadership positions are still dominated by men (Abalkhail & Allan, 2014; Davidson & Burke, 2011; PWC, 2016; Stahlberg et al., 2009; Statistisches Bundesamt, 2013). Why, therefore, are there still these huge differences, although a big number of highly educated, qualified and ambitious women enter the job market (Davidson & Burke, 2011)? Recent studies have even shown that girls tend to have higher grades than boys in high school and that men and women graduate with equal competences as well as with the same level of career motivation from university (Davidson & Burke, 2011; FAZ, 2012; Stahlberg et al., 2009). Nevertheless, entering the workplace men's and women's further career success seems to diverge (Davidson & Burke, 2011).

This is not only critical for women themselves, but the reduced number of women in high professional positions does also involve economical disadvantages for organizations as well as it reflects a non-effective use of human capital for the society. Women who invest high amounts of ambition, energy and hard work in their education and career development while still observing higher positions being more often occupied by men likely experience frustration and desire to understand the reasons for this gender inequality in career success. This frustration and dissatisfaction can lead to higher turnover rates, lower productivity and commitment of women and thus also influence the overall performance of organizations (Judge, Thoresen, Bono, & Patton, 2001; Ostroff, 1992). Moreover, companies today experience a lack of highly effective and productive managerial professionals and find themselves in a "war for talent" (Michaels, Handfield-Jones, & Axelrod, in Davidson & Burke, 2011). Thus, ignoring the talent of women and therefore of the other half of the population for (top) management positions consequently leads to higher costs and a loss in

productivity for organizations (Davidson & Burke, 2011; Littmann-Wernli & Schubert, 2001). In addition, viewing it from a macroeconomic perspective, investing in women's higher education without optimally using their skills, competences and experience afterwards squanders valuable human resources (Stahlberg et al., 2009). So overall, women's career success is highly relevant on three levels, the individual, the organizational and the societal.

One of the factors that influences career success is the support one gets during its career. Several studies already proved this by indicating that career success is not an individual credit, but that peer support and mentoring are crucial for career advancement, work and career satisfaction, promotions and compensation (Cotton, Shen, & Livne-Tarandach, 2011; Fagenson, 1989; Higgins, 2000; Scandura, 1992; Young, Cady, & Foxon, 2016). Furthermore, some studies state that the access to these mentoring relationships differ for men and women and that thus women face big obstacles in their career advancement (Abalkhail & Allan, 2015; Davidson & Burke, 2011; Ramaswami, Dreher, Bretz, & Wiethoff, 2010; Young et al., 2006). Nevertheless, these studies as well as others that are investigating the different types of support that are provided and looked for by men and women in order to enhance their career success have focused on dyadic mentoring relationships only (McKeen & Bujaki, 2007; Young et al., 2006).

However, various recent researchers represent the perspective that individuals not turn to only one organizational member for career support as the traditional mentoring approach suggests, but that they build a developmental network through which they receive assistance from multiple organizational as well as non-organizational sources (Cotton et al., 2011; Higgins & Kram, 2001; Whitely, Dougherty, & Dreher, 1991). Depending on their needs and expectations employees strategically choose for a specific network relationship that provides them with the desired support (Higgins & Kram, 2001; Gersick, Bartunek, & Dutton, 2000; Whitely et al., 1991). Resulting different structures and characteristics of these networks can then differently influence women's and men's career advancement (Cotton et al., 2011; Higgins & Kram, 2001; Seibert, Kraimer, & Liden, 2001, van Emmerik, 2004). The study by Gersick et al. (2000) used personal stories of participants to reveal gender differences in the importance of different relationships and thus in the provided support for their career success. However, it did not focus on developmental networks analyzing their different structures and characteristics for men and women. Moreover, previous research on the effects of developmental network structures on different career outcomes by Higgins (2000), Higgins and Thomas (2001) and van Emmerik (2004) only covered gender as a moderator and control

variable, but did not focus on gender as a demographic antecedent that determines the structure and content of developmental networks (Dobrow, Chandler, Murphy, & Kram, 2011). These different network structures and characteristics for men and women could however give valuable insights on why career success and management positions are still more often attributed to male than to female professionals.

Therefore, the aim of the following study is to reveal gender specific network structures and explore the differences between men and women in receiving support within their developmental networks. Consequently, the studied research question is:

How does the developmental network structure in terms of size (total number of developers), diversity (degree to which these developers stem from different social sources) and multiplexity (variety and type of support provided per developer) differ for men and women?

Theoretical background

From mentoring dyads to developmental networks

Various studies state that career success is not an individual credit and thus investigated the concept of mentoring and its effects on career advancement (Fagenson, 1989; Higgins, 2000; Scandura, 1992; Young et al., 2016). According to Kram (in Young et al., 2016) mentoring is the support given by a more experienced, often senior level employee (mentor) to a less experienced individual in the organization (protégé) that seeks for growth and advancement (see also Fagenson, 1989; Ramaswami et al., 2010). In her framework Kram distinguishes two different functions the mentor can provide. First, the career function includes giving advice, sponsorship, providing challenging assignments, making the protégé visible to influential others as well as protecting the protégé from political situations. Second, the psychosocial function counts for listening to a protégé's concerns, acceptance and confirmation, role modeling, counseling and friendship. Depending on the protégés' needs and expectations they seek and receive different functions and subfunctions and thereby enhance their career progress.

Instead of this traditional view on mentoring relationships, in which only one senior manager provides support to a less experienced employee, more and more researchers today hold the perspective that employees approach several developmental relationships to receive these support functions. Since employees nowadays are increasingly confronted with restructuration, decentralization, rapid technological change as well as with globalized and

team-based work contexts, a reconsideration of the mentoring boundaries is taking place. Protégés tend to receive their career and psychosocial support from multiple sources inside and outside their organization in order to stay flexible and up-to date (Cotton et al., 2011; Higgins & Kram, 2001; Whitely et al., 1991).

Within a so-called developmental network, derived from their social network, protégés build this variety of interpersonal relationships that provide them with an even broader variety of support than a traditional mentor does (Cotton et al., 2011; Murphy & Kram, 2010; Seibert et al., 2001). These additional types of support are, for example, enabling freedom and opportunity for skill development as part of the career function and providing inspiration and motivation as part of the psychosocial function (Cotton et al., 2011). In addition, Janssen, van Vuuren and de Jong (2013) in their qualitative study identified several other subfunctions in the categories autonomy, competence and relatedness that extend the range of support developmental networks offer compared to traditional mentoring dyads. Moreover, in contrast to Kram (1985) who traditionally considered role modeling as a subcategory of psychosocial support, recent studies on developmental networks emphasize its importance and thus increasingly identify role modeling as a third separate support function (Janssen et al., 2013; Murphy & Kram, 2010; Scandura, 1992).

The sources that provide these support functions within the network are called developers, as they are "taking an active interest in and action to advance the protégé's career by providing developmental assistance" (Higgins & Kram, 2001, p. 268). Within the developmental networks employees strategically choose for certain relationships with specialized others depending on their expectations and the support they are looking for (Higgins & Kram, 2001; Gersick et al., 2000; Whitely et al., 1991). Several researchers that investigated the effects of developmental networks on different career outcomes and covered gender as a moderator or control variable found indications that the characteristics of developmental networks might differ for men and women (Higgins, 2000; Higgins & Thomas, 2001, van Emmerik, 2004). Nevertheless, no study has yet placed the focus on gender as an antecedent of the developmental network structure (Dobrow et al., 2011).

Gender differences

Stereotypic gender attributes and role behavior arise from socialization and cultural conception (Bussey & Bandura, 1999; West & Zimmerman, 1987). In other words, men and women over time learn and enact appropriate behaviors about what it means to be a woman

and a men (van Emmerik, 2004). Because of this stereotypic role behavior and thus diverging pursued goals and priorities it is very likely that men and women vary in the way they approach the above mentioned support functions within their networks, which can help to explain their different career success (Higgins, 2000; Young et al., 2006). According to a study of Gersick et al. (2000) men help each other to strategize on how to win by finding the right partner and projects to pursue. Thus, one can assume that the support men look for in mentoring relationships is highly career oriented. This is also in line with the traditional stereotypes men are associated with. Men are expected to be assertive, ambitious, individualistic, aggressive and competitive and hence likely look for and provide career support to others (Diekman & Eagly, 2000; Ebert et al., 2014; Stahlberg et al., 2009).

In contrast to these agentic characteristics of men, women are often related with communal qualities. Due to their traditional role as a housewife and mother they are expected to be supportive, caring and nurturing, emotional and deferent (Dainton & Zelley, 2014; Stahlberg et al., 2009). Therefore, women are expected to seek more emotional support among each other and look for a psychosocial mentoring partner. The qualitative study by Gersick et al. (2000), that focused on the importance of relationships in professional life, confirmed this by indicating that women, especially among other women, seek friendship and social support such as being accepted and valued as well as being rescued from harm. Nevertheless, no developmental network study has yet analyzed and compared the network structures and thus also the support provided inside for men and women.

Furthermore, mentoring studies state that women face many difficulties in achieving the same support as men, for in most countries managers are supposed to be assertive and decisive and thus management positions are more closely related to men characteristics (Hofstede, 1980; Jandt, 2004; Kim, as cited in Dainton & Zelley, 2014). Therefore, men are often more central and powerful in organizations than women and traditional mentoring research has proven that men are more likely to serve as mentors for male as well as female protégés (Davidson & Burke, 2011; Fine & Pullins, 1998; Ramaswami et al., 2010). As men can turn to same gender mentors, they are likely to feel more comfortable, have more contact with their mentor and thus receive higher outcomes from the mentoring relationship than women (Davidson & Burke, 2011; Young et al., 2006). The similarity attraction theory explains this effect of having higher relationship outcomes when perceiving similarities between the relational partners (Berscheid & Walster, 1969; Byrne, 1971). Since women often cannot turn to high-status female managers for support, they not only tend to face cross-

gender difficulties in mentoring relationships with men, but also tend to be less well integrated in the mentoring system (Fine & Pullins, 1998; Gersick et al., 2000). Several studies provide evidence that women have less access to career advancement opportunities and thus to important organizational resources, which impedes their career success (Abalkhail & Allan, 2015; Davidson & Burke, 2011; Ramaswami et al., 2010; Young et al., 2006). In other words, they are confronted with the 'glass ceiling' effect, as they face gender discrimination when trying to build a career (Ibarra, 1992; Stahlberg et al., 2009).

With the new perspective of developmental networks where employees receive support and organizational resources not only from one mentor, but from multiple sources, this effect might be reduced (Singh, Vinnicombe, & Kumra, as cited in Abalkhail & Allan, 2015). Furthermore, women might use these network structures to reach and approach successful female professionals in order to copy their strategies to overcome gender-related barriers and thus place a higher importance on the role modeling function (Ibarra, 1997). However, previous research on developmental network structures by Higgins (2000), Higgins and Thomas (2001) and van Emmerik (2004) only covered gender as a moderator and control variable, but did not yet address the question of how gender determines developmental network structure and content (Dobrow et al., 2011). Therefore, the following study aims to explore how men and women differently build their networks and seek support within them.

Developmental network structures

So, as men and women on the one hand possess different gender roles, stereotypic attributes and priorities and on the other hand face different opportunities and obstacles during their career, it is very likely that they differ in the way they build developmental networks. This determines how much and what kind of support they receive and finally influences their career success (Aldrich, Reese, & Dubini, 1989; Seibert et al., 2001).

Developmental networks are simultaneously held relationships with actors that the individual identifies as developers (Higgins & Kram, 2001). From a social network point of view they are thus called egocentric networks, as the network is viewed from the perspective of the one person that is seeking support (Cotton et al., 2011; Higgins & Kram, 2001; Ibarra, 1997). Depending on who this person chooses to connect with and what relational ties it pursues, different network structures arise. These structures then determine the flow of information and resources that the ego receives from multiple sources (Cotton et al., 2011; Harythornthwaite, 1996). In other words, they influence the availability and access to

valuable social capital (Harythornthwaite, 1996; Seibert et al., 2001). According to Coleman (1990) "social capital [is] any aspect of social structure that creates value and facilitates the actions of the individuals within that social structure" (as cited by Seibert et al., 2001, p. 220). Therefore, individuals in possession of a network with characteristics that enable and support the access to important social capital, in this case to career, psychosocial and role modeling support, likely benefit from greater career success (Seibert et al., 2001). The career success benefits are thereby not only derived from dyadic relationships within the network, but also from the aggregation of network features (Ibarra, 1997). Thus, investigating the developmental network structures this study will consider the network size measuring the total number of developers, its diversity referring to the degree to which these developers stem from different social sources as well as the network's multiplexity which implies the variety and type of support that is provided per tie (see Cotton et al., 2011).

The following argumentation for the hypotheses of this study is based on the general assumption that people like to interact with similar others, as this facilitates communication, improves the predictability of behavior and enhances trust (Ibarra, 1993). This leads to the conclusion that men and women prefer same gender developers in contrast to crossing gender lines for support (Dobrow et al., 2011; Ibarra, 1997). Moreover, because the corporate world was traditionally reserved for men, it is still very men dominated and management ranks are more often occupied by men than by women (Renzulli, Aldrich, & Moore, 2000). Thus, it is easier for them to find same gender developers in the business world and women are confronted with structural constraints when building their developmental network.

Network size. The size of a developmental network determined by the number of developers that an individual receives support from influences how many opportunities one has to access important social resources. Thus, a bigger developmental network implies a higher availability of career, psychosocial as well as role modeling support promoting the individual's career. In line with this argumentation several researchers have already shown that larger networks lead to higher career outcomes (Cotton et al., 2011; Higgins & Thomas, 2001; Murphy & Kram, 2010; van Emmerik, 2004). Looking at it from a social network point of view one could argue that women build bigger developmental networks than men, for they are to a higher degree socially connected and place high value on relationships with others (Ajrouch, Blandon, & Antonucci, 2005; Moore, 1990; Shaw et al., 2006). However, as previously stated people prefer same gender developers and women likely have significantly less availability and accessibility to other female professionals, for they are often still a

minority in the corporate world, especially in management position (Dobrow et al., 2011; Ibarra, 1993; Young et al., 2016). In other words, women in contrast to men have to start building their networks from an outsider position (Gersick et al., 2000; van Emmerik, 2004). These structural constraints likely hamper their tendency to build bigger networks in the corporate world and thus this study hypothesizes:

H1: Men have a bigger developmental network than women.

Network diversity. Diversity is attributed to the variety within a developmental network. In other words, it reflects the degree to which an individual's relations stem from different social systems (Dobrow et al., 2011). Many studies have yet only focused on developmental relations inside the organization differing in terms of for example gender, hierarchical level and organizational function (Seibert et al., 2001). However, recent research has shown that also developers from outside the organization, for example family, friends, study or business contacts, can provide a high contribution to one's career success (Dobrow et al., 2011; Higgins & Thomas, 2001; Murphy, & Kram, 2011). Thus, this study will not only focus on internal but also on external connections, when investigating the diversity of women and men's developmental networks.

The higher the diversity and therefore the less similar and interconnected the developers within a network are, the less repetitive and redundant information and resources they provide (Harythornthwaite, 1996; Higgins & Kram, 2001; Seibert et al., 2001). Thus, they most likely offer a broader range of support, which will positively affect the ego's career success. Several studies confirm this and provide evidence that relationships with people from different work units, organizational functions and departments lead to higher career outcomes (Cotton et al., 2011; Ibarra, 1997).

However, as stated before people prefer to interact with similar others, for this facilitates trust building and communication (Harythornthwaite, 1996; Ibarra, 1993). Thus, building a network with diverse developers from different social arenas is easier for people that have access to a bigger set of same gender others within different functions and departments. Several studies state that same gender ties are crucial for accurate information and role modeling as well as for high amounts of career and psychosocial support, therefore leading to higher career outcomes (Dobrow et al., 2011; Ibarra, 1997). Moreover, structurally similar people have more influence over one and another and can thus more easily promote the other person's success (McPherson, Smith-Lovin, & Cook, 2001). As women most likely

face difficulties to establish a big set of same gender developers inside the organization, they have to cross gender lines more often than men within their developmental networks, which likely hampers their career advancement (Gersick et al., 2000; Ibarra, 1993; Ibarra, 1997; McKeen & Bujaki, 2007). Consequently, the second hypothesis is:

H2: Men have more same gender developers than women.

So, as men have more possibilities to interact with same gender others and management and leadership positions are still more often occupied by men, they also likely have more access to same gender developers from higher hierarchical levels (Gersick et al., 2000; Renzulli et al., 2000). Connections with people from a higher status position can have a big impact on an individual's long-term career success, for they can serve as a role model on how to behave in order to advance, they possess authority and power for changes and they can provide better access to information and resources that are needed for progress (Higgins & Thomas, 2001; Seibert et al., 2001). Moreover, employees with high status relationships likely feel more confident and secure, as these connections can serve as a signal for their own career potential (Higgins & Thomas, 2001). Due to the fact that women are often still a minority in the men dominated management world, they likely know fewer female professionals in higher hierarchical levels that could help them to advance to higher positions (Gersick et al., 2000):

H3: Men have more developers from higher hierarchical levels than women.

The structural opportunities of having a higher availability and accessibility to same gender developers do not only offer men to ally with other men in higher hierarchical positions, but also with same gender developers from different organizational functions and departments, that foster the overall diversity of men's developmental networks inside the organization (Dobrow et al., 2011; Young et al., 2016). Various studies have already shown that men benefit from very diverse networks (Gersick et al., 2000; Moore, 1990; Renzulli et al., 2000). Furthermore, men tend to have less close and more content-bound relationships, which makes it easier to reach new and different people for career support inside the organization (McPherson et al., 2001). These bridging relationships have already been proven to be an important indicator for career success (Granovetter, 1973; Seibert et al., 2001; Shaw, Lam, Carter, & Wilson, 2006). Therefore, this study hypothesizes:

H4a: Men's developmental networks inside the organization are more diverse than the ones of women.

H4b: Men place more importance on their developmental network inside the organization than women.

However, researchers also argue that because of men dominated organizations women have to expand their contacts outside their work group or even outside the company in order to reach out other female professionals for support and role modeling (Ibarra, 1993; Ibarra, 1997; Moore, 1990). So, in order to find other successful women who they can learn and receive support from they have to search in a much wider range than men. Thus, women likely also look for support outside the company and have more diverse developmental relationships here than men. That women more strongly focus on contacts outside the company is in line with the social network literature confirming that women are to a higher degree than men socially connected, especially with kinship relationships (Ajrouch, Blandon, & Antonucci, 2005; Moore, 1990; Shaw et al., 2006, van Emmerik, 2004). Moreover, according to their communal role behavior women likely seek psychosocial and emotional support, which is presumably more often provided by developers from outside the organization, for example by family and friends (Gersick et al., 2000; Higgins & Kram, 2001; Moore, 1990). These close people also facilitate women to build strong and emotional intense ties, as it is characteristic for their gender (Gersick et al., 2000; Ibarra, 1997; Moore, 1990; Renzulli et al., 2000). In addition, research has already shown that men are very much integrated into their profession and the organization they work for whereas women are more often outside this center implying that they have to look for developers outside the organization (Gersick et al., 2000):

H5a: Women's developmental networks outside the organization are more diverse than the ones of men.

H5b: Women place more importance on their developmental network outside the organization than men.

Network multiplexity. The multiplexity of a network refers to the variety of support that is provided by each relationship within the network (Cotton et al., 2011). Hence, it gives insights on what combination of career, psychosocial and role modeling support the developer provides (Dobrow et al., 2011). Based on their goals employees strategically

choose a developer that offers the right constellation and amount of support functions for their best career outcome (Dobrow et al., 2011; Higgins, 2000; Higgins & Thomas, 2001). Thus, the information on the multiplexity reveals the richness and importance of a certain connection for an individual within its developmental network (Cotton et al., 2011).

Multiplex relationships offering a broad range of different support functions most likely have the biggest impact on an employee's career success, for on the one hand they can encourage work satisfaction and optimism as well as on the other hand a higher efficacy, remuneration and promotion (Cotton et al., 2011; Dobrow et al., 2011). Moreover, these multiplex relationships seem to be more easily build between same gender individuals, as the higher trust within these connections facilitates the exchange of a bigger variety of support (Ibarra, 1993; Ibarra, 1993). Research has shown that women tend to turn to other women for psychosocial support, but receive career support from men, as there are often not enough highly professional women that could provide them with career assistance (Ibarra, 1993; Higgins & Kram, 2001; McKeen & Bujaki, 2007). Moreover, within the cross-gender relationship with men they rarely receive social support or role modeling in addition to the instrumental support, as this is more easily transmitted between same-gender individuals (Ibarra, 1993). In other words, women most likely do not receive all different types of support from only one developmental relationship in high amount; thus, tending towards more uniplex networks. In contrast, men, who have a higher accessibility to same-gender others and thus less cross-sex relationships within their developmental network, more likely receive various support functions per developer (Ibarra, 1993); especially from their most important developers, as they have the highest influence on their career advancement:

H6: Men have more multiplex relationships with their most important developers than women.

Furthermore, as stated before women's stereotypic role behavior is attributed with communal qualities (Dainton & Zelley, 2014; Stahlberg et al., 2009; van Emmerik, 2004). Thus, they are expected to be more sensitive and seek more social support than men (van Emmerik, 2004). In addition, social network literature has proven that women possess more kinship relationships, which can also serve as a signal for their tendency to build emotional intense connections that provide psychosocial support (Ajrouch et al., 2005; Moore, 1990; Renzulli et al., 2000). This is likely especially for their most important developers the case, as they are more close and have more influence on them. Moreover, especially with other

women they seem to exchange this socio emotional support (Higgins & Kram, 2001; Ibarra, 1993; McKeen & Bujaki, 2007). Besides that, cross-gender relationships with men that could provide them with instrumental assistance are more difficult to enact and remain. Thus overall, they likely receive more social and less career assistance from their most important developers (Gersick et al., 2000; Renzulli et al., 2000). In addition, because of their agentic role behavior to focus on strength and individuality men likely provide and seek more career support (Ebert et al., 2014; McKeen & Bujaki, 2007; van Emmerik, 2004). They jointly work on strategies about the right relationships and projects to pursue and thereby advance each other's career (Allen & Finkelstein, 2003; Gersick et al., 2000). Therefore, they tend to receive more career support from their most important developers than women leading to the last hypothesis:

H7: From their most important developers men receive more career support whereas women receive more psychosocial support.

Method

Research Design

This research is part of a larger project, namely of the cooperation of two studies.[1] This study uses a quantitative approach, for previous research on developmental networks proved that questionnaires are a reliable method to map the general structure and characteristics of developmental networks (Higgins, 2000; Higgins & Thomas, 2001; Murphy &Kram, 2010; van Emmerik, 2004). Thus, also this study uses a network analysis survey to determine and compare the size, diversity and multiplexity of men's and women's developmental networks and thereby test the proposed hypotheses. Moreover, some of the previous studies conducted their research for a specific occupation (Higgins, 2000; Higgens & Thomas, 2001) or within one single organization (van Emmerik, 2004). However, this study does not limit its research to these factors in order to reflect and compare a broad range of different industries and organizational cultures.

[1] The cooperating ongoing study is conducted by Kimberly van Ooijen and focuses on the influence of organizational culture on the developmental networks of men and women. Both studies represent an optimal combination, for they both investigate the antecedents of developmental networks. However, the present quantitative study focuses on the individual-level characteristics (gender) of the employee whereas the qualitative research by Kimberly van Ooijen focuses on contextual factors (Dobrow et al., 2011).

Sampling procedure

For the data collection the online survey tool qualtrics was used. The online questionnaire was sent to business and study contacts as well as friends and family of the researchers via e-mail and social media platforms in Germany and the Netherlands.

As a requirement for participation respondents had to be a German or Dutch working professionals. Previous research has shown that cultural background can have a significant influence on women's career advancement and it is thus important to consider a society's culture when analyzing and comparing the developmental networks of men and women (Abalkhail & Allan, 2014). The choice for Germany and the Netherlands resulted on the one hand from the home countries of both researchers from the cooperating studies and on the other hand from the fact that geoculturally and according to Hofstede's cultural dimensions these two countries are very similar to each other (Hofstede, 2001). However, they differ in the dimension of masculinity and femininity and thus in the society's gender, which might influence men's and women's developmental network structures (Hofstede, 2001; West & Zimmerman, 1987). Therefore, the data has been controlled for the nationality of participants to ensure that this cultural difference does not falsify the outcomes for the developmental network structures of men and women.

As a second requirement only people within an employment relationship participated in the survey in order to allow revealing the networks men and women build within the organization they are working for.

Furthermore, all participants possessed a Bachelor's degree or higher in order to assure a similar educational background that shapes people's beliefs and attitudes. People with the same educational background are expected to have similar beliefs regarding the goal and direction of their life. Furthermore, they likely perceive the same opportunities, which influences their behavior and expectations (Social Economics, n.d.). Therefore, the data has been controlled for the educational degree in order to assure comparability. However, life goals and ambition are still individual factors that vary between people. Thus, they are included as additional measures in the questionnaire.

Contacted people were not only asked to participate in the survey in case they fulfilled these requirements but also to send it to people in their network that fulfilled the conditions. Thereby, the online survey was also send to several email lists of organizations and alumni

associations. Furthermore, the link for the online survey was posted in different groups on social media platforms (e.g. Facebook, Xing, Linkedin). So, a convenience sampling approach and snowball sampling was applied to recruit participants. Although these methods are predicted to provide limited scientific generalizability, they proved to be extremely effective in obtaining a significant sample within a short period of time and without any financial resources (Bhattacherjee, 2012). The clicking rate confirmed this showing that the online survey reached more than 700 people, of which nearly 450 started filling in the survey. However, only 283 were completed and could be used for analysis. The high drop-out rate will be discussed in the limitations and future research section.

Sample

Based on the requirements only one case from the completed surveys had to be eliminated, as it was filled out by a student. From the N =282 remaining participants 147 were men (52%) and 135 women (48%), 233 were of German nationality (83%) and 49 of Dutch (17%). The average age of respondents was 36.71 (SD =10.33) ranging from 22 to 64; their average total work experience since graduation was 10.18 (SD =9.62) and their average tenure with the organization they are currently working for was 6.27 (SD =7.1). Furthermore, the majority of the survey respondents possessed a Master's degree or higher (n =201, 71%) while only 81 participated with a Bachelor's degree (29%).

Procedure

Starting the online questionnaire participants first were asked to choose their language (Dutch or German). This is because research recommends using questionnaires worded in the mother tongue of participants, for it assures a higher reliability (Chan & Wittkowski, 2012). After selecting their language, a short introduction text followed that explained participants the purpose of the study, the requirements to participate as well as they were guaranteed the anonymity of their data. Next, they were asked some personal questions regarding their job and career while following they were guided through the questions on their developmental network size, diversity and multiplexity.

Measures

Because the questionnaire was provided in Dutch and German, but most of the questions and scales used were obtained from English language literature, the questionnaire had to be translated. In order to assure an analogous translation without loosing the meaning

of the concept a backward-forward translation method was used (Beaton, Bombardier, Guillemin, & Ferraz, 2000). First, two native German/ Dutch students with proficient English skills translated the questionnaire into German/ Dutch. After that, two different independent students translated these German/ Dutch versions back into English. Thus, the two English versions (in each case for German and Dutch) could be compared with the original English survey, which in some cases revealed differences in the meaning of words and questions. These differences were then reviewed by the researchers and the best matching translation was chosen.

Network size. To map and analyze the developmental networks of men and women a name generator was used (Higgins, 2000; Higgins & Thomas, 2001; Murphy & Kram, 2010; van Emmerik, 2004). Participants were asked to list "individuals who have taken an active interest in and action to advance their career by assisting with their personal and professional development" (Higgins, 2000). The name generator was divided into developers from inside and outside the organization. For both participants were given the possibility to name up to ten developers. Previous studies using this method have shown that participants on average name four to five developers (Dobrow et al., 2011). However, because one of the aims of this study is to reveal and compare differences in the size of people's developmental networks, they were given more options. Furthermore, participants were informed that they were free to either use names or initials as long as they were still identifiable for themselves in the following questions and that they could use as many rows as they needed. The total number of names and initials that participants listed was then indicated as the network size.

Network diversity. Following, questions on people's network diversity were also divided into developers from inside and outside the organization. For people participants previously named as developers from inside the organization they were asked to state their gender as well as hierarchical level and organizational department (compared to themselves). Outside the organization the network diversity was determined by developers' gender as well as the social arena participants primary knew this person from (family, friends, studies, work). For every participant the total amount of each characteristic among their developers was then calculated and later on compared based on the participant's gender.

After that, participants were asked to rank their six most important developers as a preparation step for the next question. Furthermore, counting the number of developers from

inside and outside the organization within these six people revealed whether they were more strongly influenced by their inside or outside developmental network.

Network multiplexity and type of support. In order to measure the type of support these developers provided and thereby also the network multiplexity (variety of support provided per developer) the nine-item mentoring functions scale by Pelligrini and Scandura (2005) was added to the questionnaire. This scale was used instead of the original support (sub-) functions identified by Kram (1985), because the items stated here are also applicable for the support provided by relationships from outside the organization (Murphy & Kram, 2010). Due to time and feasibility reasons participants were only asked to fill out the scale for the previously ranked six most important and not for all listed developers. The scale includes three questions to assess each support function, for example "He/She helps me coordinate professional goals" (career support), " I share personal problems with him/her" (psychosocial support), " I try to model my behavior after him/her" (role modeling) on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). The three items for each support function proved a high reliability in this study with a Cronbach's alpha coefficient of $\alpha = 0.76$ for the career support, a Cronbach's alpha of $\alpha = 0.89$ for the psychosocial support function and a Cronbach's alpha coefficient of $\alpha = 0.84$ for the role modeling support. For the measurement of support functions average amounts of each type of support were determined across these six developers for each survey respondent, consistent with previous analysis on network support (Higgins, 2000; Higgins & Thomas, 2001; Murphy & Kram, 2010). Moreover, in order to measure how much variety of support survey participants received from their most important developers three different multiplexity degrees were calculated. Developers from which survey respondents received an average score of two and a half or higher for all three support functions were counted as developers with a multiplexity degree of three. Developers that provided this average score for two different types of support were considered as developers with a multiplexity degree of two and those that provided only one support function with an average score of two and a half or higher were accounted as uniplex relationships.

Control variables

Previous research has shown that people's work experience as well as their current career stage influences how they seek support and which opportunities for career advancement they experience (Higgins & Thomas, 2001; van Eck Peluchette & Jeanquart,

1996). Thus, they also likely have an impact on people's developmental network structure. Therefore, questions on participant's age, their general work tenure ("How many years have you been working in your occupation since your graduation?") as well as their organizational work tenure ("How many years have you been working for the organization you are currently working for?") were included in the questionnaire. Moreover, a question revealing people's current managerial level (non-manager/ low-level manager/ middle-level manager/ top-level manager) was added.

However, it might not only be influential how much one has already worked and achieved in its job, but also how much value this person places on its career. How important career success is in comparison to other life goals and how much time and energy one is thus willing to invest in it, can have a big impact on if and how a person builds a developmental network. Thus, the occupational part of the Life Role Salience Scale by Amatea, Gail Cross, Clark and Bobby (1986) was integrated in the questionnaire. The 5-point scale ranging from 1 (disagree) to 5 (agree) included ten statements, for example "Having work/ a career that is interesting and exciting to me is my most important life goal" or "I expect to devote whatever time and energy it takes to move up in my job/ career field". These ten items yielded a Cronbach's alpha coefficient of $\alpha = 0.84$ for this research, representing a high reliability.

Furthermore, not only individual factors can be crucial for developmental networks, but research also states that the industrial and organizational context can have a great impact on how men and women differently seek and provide support (Dobrow et al., 2011; Dougherty, Dreher, Arunachalam, & Wilbanks, 2013; Ramaswami et al., 2010). Especially the masculinity and femininity of an organizational culture have to be taken into account here. Therefore, participants were asked to state their occupation as well as the branch their company was operating in. Based on literature the organizational culture of each participant was then categorized either as feminine or masculine. In addition, also the organizational size was included, as a larger organization might facilitate more developmental relationships inside the organization (Murphy & Kram, 2010). It was determined based on the number of employees working within an organization (under 100/ 100-499/ 500-999/ 1.000-4.999/ 5.000-10.000/ more than 10.000).

The following table (Table 1) represents a holistic view of the measured characteristics of the survey respondents.

Table 1

Demographics of the survey respondents (N =282)

		n	%
Gender	Male	147	52
	Female	135	48
Nationality	German	233	83
	Dutch	49	17
Education Level	Bachelor	81	29
	Master or higher	201	71
Managerial Level	Non-manager	130	46
	Low-level manager	53	19
	Middle-level manager	73	26
	Top-level manager	26	9
Organizational size	Under 100	87	31
	100-499	52	18
	500-999	34	12
	1000-4999	50	71
	5000-10.000	18	6
	More than 10.000	41	15
Organizational culture	Masculine	171	62
	Feminine	109	39
Age	-	(M =36.71, SD =10.33)	
Work tenure	-	(M =10.18, SD =9.62)	
Organizational tenure	-	(M =6.27, SD =7.1)	
Occupational role importance	-	(M =3.42, SD =0.66)	

To evaluate whether these demographic characteristics differed between men and women in this study, chi-square tests and one-way ANOVA were conducted.

A chi-square test was performed for education level and no statistically significant difference was found between men and women, $X^2(1, N=282) = .72$, $p = .4$. Similarly, the chi-square test for nationality revealed no statistically significance among the two gender groups, $X^2(1, N=282) = .24$, $p = .63$. Moreover, also the one-way ANOVA performed for the occupational role importance demonstrated no statistically significant difference between

male and female participants, $F(1, 280) = .3$, $p = .58$. A chi-square test performed for the organizational size did also not show any statistically significant difference, $X^2(5, N = 282) = 2.01$, $p = .85$. Furthermore, also the organizational culture did not differ statistically significant between men and women in this study, $X^2(1, N = 280) = .39$, $p = .53$. Therefore, results cannot be explained on these variables and they are thus not included in the analysis.

However, the one-way ANOVA for age revealed statistically significant differences for men and women, $F(1, 280) = 17.91$, $p = .00$. In this sample men on average were older ($M = 39.13$, $SD = 11.08$) than women ($M = 34.07$, $SD = 8.76$). Similarly, the chi-square test for managerial level demonstrated statistically significant results, $X^2(3, N = 282) = 11.71$, $p = .00$. Non-managers were more often women than men whereas in all three other categories men made up the majority. For the work tenure a one-way ANOVA was performed and statistically significant differences for men and women were also found here, $F(1, 280) = 17.74$, $p = .00$. In this study men on average possessed a higher work tenure ($M = 12.42$, $SD = 10.67$) than women ($M = 7.73$, $SD = 7.64$). Moreover, also the one-way ANOVA for organizational work tenure revealed statistically significant differences for male and female participants, $F(1, 280) = 6.43$, $p = .01$; men on average had been working for a longer period in the organization they were currently working for ($M = 7.29$, $SD = 8.01$) than women ($M = 5.16$, $SD = 5.78$). An overview on these four variables for men and women is given in table 2.

Table 2

Comparison of age, work tenure, organizational work tenure and managerial level for men and women

		Men		Women	
		M	*SD*	*M*	*SD*
Age		39.13	11.08	34.07	8.76
Work tenure		12.42	10.67	7.73	7.64
Organizational work tenure		7.29	8.01	5.16	5.78
Managerial level	Non-manager	(*n* =58, 45%)		(*n* =72, 55%)	
	Low-level manager	(*n* =28, 53%)		(*n* =25, 47%)	
	Middle-level manager	(*n* =40, 55%)		(*n =33, 45%)*	
	Top-level manager	(*n* =21, 81%)		(*n* =5, 19%)	

Because men and women in this sample differed statistically significant on these four demographics, the following analysis is controlled for these variables. Age and work tenure proved to be highly correlated ($r(264) = .92$, $p = .00$) as well as work tenure and organizational work tenure are also very strongly correlated ($r(264) = 0.66$, $p = .00$). Thus, only work tenure is included as a covariate in the analysis, for the other two variables are statistical redundant. In addition, in order to control for managerial level its interaction effect with gender on the dependent variables is checked.

Results

Network size

The network analysis revealed 16 survey respondents that indicated to have no developmental network, neither inside nor outside the organization. A one-way ANOVA test demonstrated that these people differed statistically significant from those with a network size bigger than zero in terms of their occupational role importance, $F(1, 280) = 20.43$, $p = .00$. Respondents indicating that they had no network placed less importance on their occupational role ($M = 2.71$, $SD = .91$) than respondents with a developmental network ($M = 3.45$, $SD = .62$). For the other demographic characteristics both groups (respondents with and without a developmental network) did not differ statistically significant from each other.

However, in order to make sure these outliers do not falsify the results these 16 responses were excluded from the following analysis of the network size, diversity and multiplexity.

A two-way ANCOVA controlling for work tenure was performed for gender and managerial level and no interaction effect, neither for the total network size ($F(3, 257) = 1.28$, $p = .28$, $\eta_p^2 = .02$), nor for the network outside ($F(3, 257) = 1.92$, $p = .13$, $\eta_p^2 = .02$) or inside the organization($F(3, 257) = .89$, $p = .45$, $\eta_p^2 = .01$) was found. However, looking at the main effect of gender a statistically significant difference for men and women on the total network size could be revealed, $F(1,257) = 12.09$, $p = .00$, $\eta_p^2 = .05$. Contrary to hypothesis 1 the network size of women ($M = 7.28$, $SD = .41$) indicated to be bigger than the one of men ($M = 5.51$, $SD = .29$). **Thus**, **H1 is rejected.** However, the partial eta squared value demonstrates that the effect of gender on the total network size is only small to moderate. A slightly larger effect was found for the network size outside the organization ($F(1, 257) = 17.85$, $p = .00$, $\eta_p^2 = .07$) with women having a bigger network outside the organization ($M = 3.75$, $SD = .25$) than men ($M = 2.42$, $SD = .18$), but inside the organization no statistically significant gender differences could be found, $F(1, 257) = 2.03$, $p = .16$, $\eta_p^2 = .01$.

Table 3

Overview of the results for gender on network size

	F	*df*	*Sig.*	η_p^2
Total size	12.09	1, 257	.00	.05
Size inside the organization	2.03	1, 257	.16	.01
Size outside the organization	17.85	1, 257	.00	.07

Network diversity

Same gender developers. A 2x2 ANCOVA was performed in order to investigate the effect of gender and managerial level on the number of men in developmental networks after controlling for work tenure and the interaction effect proved not to be statistically significant ($F(3, 257) = 2.21$, $p = .09$, $\eta_p^2 = .03$), not inside the organization ($F(3, 257) = 1.41$, $p = .24$, $\eta_p^2 = .02$) and outside the organization, $F(3, 257) = 1.56$, $p = .20$, $\eta_p^2 = .02$. Moreover, also the main effect for gender revealed no statistically significant differences between male and female participants, $F(1, 257) = .03$, $p = .58$, $\eta_p^2 < .01$. This effect could be observed for the

networks inside the organization ($F(1, 257) = 1.08$, $p = .30$, $\eta_p^2 < .01$) as well as outside the organization, $F(1, 257) = .14$, $p = .71$, $\eta_p^2 < .01$.

Analyzing (two-way ANCOVA controlling for work tenure) on the other hand the number of females in the networks of participants demonstrated a statistically significant difference for men and women with a large effect size ($F(1, 257) = 31.08$, $p = .00$, $\eta_p^2 = .11$) while it was affirmed that there was no interaction effect with managerial level, $F(3, 257) = .15$, $p = .93$, $\eta_p^2 < .01$; this was also not the case for networks inside ($F(3, 257) = .56$, $p = .64$, $\eta_p^2 = .01$) and outside the organization, $F(3, 257) = 1.03$, $p = .38$, $\eta_p^2 = .01$. In contrast to the number of men in a network that did not differ for male and female respondents women tend to have more female developers ($M = 3.53$, $SD = .29$) than men ($M = 1.56$, $SD = .20$) in their developmental networks. This is the same for networks inside ($F(1, 257) = 12.65$, $p = .00$, $\eta_p^2 = .05$) and outside the organization, $F(1, 257) = 28.02$, $p = .00$, $\eta_p^2 = .10$. However, the effect of gender on the number of female developers proved to be larger in the networks outside than inside the organization. So, since women proved to have similar amounts of male developers in their networks as men, but men possessed significantly less relationships with female developers than women, **hypothesis 2 is confirmed** stating that men have more same gender developers while women have to cross gender lines more often.

Table 4

Overview of the results for gender on same gender developers

	F	*df*	*Sig.*	η_p^2
Male developers	.03	1, 257	.58	<.01
Male developers inside the organization	1.08	1, 257	.30	<.01
Male developers outside the organization	.14	1, 257	.71	<.01
Female developers	31.08	1, 257	.00	.11
Female developers inside the organization	12.65	1, 257	.00	.05
Female developers outside the organization	28.02	1, 257	.00	.10

Higher hierarchical level developers. Based on a two-way analysis of variance (ANCOVA) controlling for work tenure the interaction effect of managerial level and gender on the mean number of higher hierarchical level developers was found not to be statistically

significant, $F(3, 257) = .55$, $p = .65$, $\eta_p^2 = .01$. Moreover, the analysis did also not show a statistically significant difference for men and women on the number of developers from higher hierarchical levels, $F(1, 257) = .30$, $p = .58$, $\eta_p^2 < .01$. Therefore, **hypothesis 3 is rejected.**

Table 5

Overview of the results for gender on higher hierarchical level developers

	F	*df*	*Sig.*	η_p^2
Higher hierarchical level developers	.55	1, 257	.65	.01

Diversity inside the organization. In order to investigate the differences of gender on the number of developers stemming from different organizational departments a two-way ANCOVA with gender and managerial level controlling for work tenure was conducted. This ascertained that there was no interaction effect between gender and managerial level ($F(3, 257) = .43$, $p = .73$, $\eta_p^2 = .01$) as well as it did not find a statistically significant main effect for men and women on the number of developers from different organizational departments, $F(1, 257) = 1.77$, $p = .18$, $\eta_p^2 = .01$. **Therefore, hypothesis H4a is rejected**. Moreover, the analysis of the mean number of developers from inside the organization within the ranking of the six most important developers also revealed no interaction effect ($F(3, 257) = .86$, $p = .46$, $\eta_p^2 = .01$) as well as it showed no statistically significant differences for male and female respondents ($F(1, 257) = .07$, $p = .79$, $\eta_p^2 < .01$), which is **contrary to the expectations in H4b**.

Table 6

Overview of the results for gender on the network diversity inside the organization and on the importance of developers from inside the organization

	F	*df*	*Sig.*	η_p^2
Different organizational department developers	1.77	1, 257	.18	.01
Developers from inside the organization within the six most important developers	.07	1, 257	.79	<.01

Diversity outside the organization. A two-way analysis of variance controlling for work tenure (ANCOVA) was performed for the effect of gender and managerial level on the

mean number of family contacts within the developmental network outside the organization. The interaction effect proved not to be statistically significant ($F(3, 257) = 1.08$, $p = .36$, $\eta_p^2 = .01$), but a statistically significant difference for gender could be revealed, $F(1, 257) = 6.92$, $p = .01$, $\eta_p^2 = .03$. As expected women on average displayed more family contacts within their networks ($M = 1.4$, $SD = .15$) than men ($M = .90$, $SD = .11$). However, gender presented a quite small effect size on the number of family developers. A bigger practical significance of gender was found for the number of friends within the developmental networks, which proved to be also statistically significant different for men and women ($F(1, 257) = 14.45$, $p = .00$, $\eta_p^2 = .05$) while it was affirmed that the interaction effect with managerial level was not statistically significant, $F(3, 257) = 2.28$, $p = .08$, $\eta_p^2 = .03$. Women possessed more relationships with friends ($M = 1.41$, $SD = .15$) than men ($M = .70$, $SD = .11$) within their developmental networks. **Overall, both results confirm previous expectations of hypothesis H5a**. Furthermore, also the two-way ANCOVA analysis for gender and managerial level on the number of developers from outside the organization within the ranking of the six most important developers revealed a statistically significant main effect for gender after controlling for work tenure, $F(1, 257) = 7.63$, $p = .01$, $\eta_p^2 = .03$. In addition, also here the interaction effect for gender and managerial level was not statistically significant, $F(3, 257) = 1.01$, $p = .39$, $\eta_p^2 = .01$. For women the most important developers stemmed more often from outside the organization ($M = 2.53$, $SD = .18$) than for men ($M = 1.92$, $SD = .13$). **Thus, H5b is confirmed**.

Table 7

Overview of the results for gender on the network diversity outside the organization and on the importance of developers from outside the organization

	F	*df*	*Sig.*	η_p^2
Family developer	6.92	1, 257	.01	.03
Friend developer	14.45	1, 257	.00	.05
Developers from outside the organization within the six most important developers	7.63	1, 257	.01	.03

Network multiplexity

Variety of support. A 2x2 ANCOVA was conducted to determine the effect of gender and managerial level on the variety of support that survey respondents received from their most important developers after controlling for work tenure. For a multiplexity with a degree of three the analysis displayed no interaction effect ($F(3, 257) = 2.05$, $p = .11$, $\eta_p^2 = .02$), but it demonstrated a statistically significant main effect for gender with a small effect size, $F(1, 257) = 6.11$, $p = .01$, $\eta_p^2 = .02$. Women proved to receive more often than men ($M = 2.57$, $SD = .17$) all three different kinds of support from only one developer ($M = 3.32$, $SD = .24$). In contrast, for the number of developers that provide two different support functions no statistically significant differences could be found for gender ($F(1, 257) = .19$, $p = .67$, $\eta_p^2 < .01$) as well as there was no interaction effect with managerial level, $F(3, 257) = .20$, $p = .90$, $\eta_p^2 < .01$. Moreover, also for the uniplex relationships among the most important developers no statistically significant effects could be revealed for men and women ($F(1, 257) = 1.33$, $p = .25$, $\eta_p^2 = .01$) or for the interaction of gender and managerial level, $F(3, 257) = 3.06$, $p = .03$, $\eta_p^2 = .04$. **These results are contrary to the prior expectations of hypothesis 6**.

Table 8

Overview of the results for gender on the variety of support

	F	*df*	*Sig.*	η_p^2
Three different support functions per developer	6.11	1, 257	.01	.02
Two different support functions per developer	.19	1, 257	.67	<.01
One support function per developer	1.33	1, 257	.25	.01

Type of support. In order to analyze the differences for men and women in the amount of career support they receive from their most important developers a two-way ANCOVA with gender and managerial level controlling for work tenure was performed and it was affirmed that the interaction effect was not statistically significant, $F(3, 252) = .14$, $p = .94$, $\eta_p^2 < .01$. Moreover, no statistically significant difference between male and female respondents could be revealed, $F(1, 252) = 3.01$, $p = .08$, $\eta_p^2 = .01$. In contrast, the two-way analysis of variance (ANCOVA) for the psychosocial support function was statistically significant for men and women ($F(1, 252) = 5.89$, $p = .02$, $\eta_p^2 = .02$) and demonstrated that women as expected got more psychosocial support ($M = 3.69$, $SD = .10$) than men ($M = 3.39$,

SD =.07) from their most important developers. In addition, it was also proved that the interaction effect for gender and managerial level on psychosocial support was not statistically significant, $F(3, 252) = .24$, $p = .87$, $\eta_p^2 < .01$. Because the expectations for psychosocial support were met, but the ones for career support not, **hypothesis 7 can be partially confirmed**. Moreover, the role modeling support function did also not display statistically significant differences for men and women ($F(1, 251) = .96$, $p = .33$, $\eta_p^2 < .01$) while it was affirmed that there was no interaction effect of gender and managerial level, $F(3, 251) = .23$, $p = .88$, $\eta_p^2 < .01$.

Table 9

Overview of the results for gender on the type of support

	F	*df*	*Sig.*	η_p^2
Career support	3.01	1, 252	.08	.01
Psychosocial support	5.89	1, 252	.02	.02
Role modeling support	.96	1, 251	.33	<.01

The following table (Table 10) gives an overview on the mean scores and standard deviation for men and women on the dependent variables that proved statistically significant main effects for gender. In addition, table 11 provides an overview of the results for the formulated hypotheses.

Table 10

Overview of the statistically significant differences for men and women on the dependent variables

	Men		Women	
	M	*SD*	*M*	*SD*
Total network size	5.51	.29	7.28	.41
Network size outside the organization	2.42	.18	3.75	.25
Female developers	1.56	.20	3.53	.29
Female developers inside the organization	.67	.12	1.39	.16
Female developers outside the organization	.89	.14	2.14	.19
Family developer	.90	.11	1.40	.15
Friend developer	.70	.11	1.41	.15
Developers from outside the organization within the six most important developers	1.92	.13	2.53	.18
Three different support functions per developer	2.57	.17	3.32	.24
Psychosocial support	3.39	.07	3.69	.10

Table 11

Overview of the results for the formulated hypotheses

	Results
H1: Men have a bigger developmental network than women.	Rejected
H2: Men have more same gender developers than women.	Confirmed
H3: Men have more developers from higher hierarchical levels than women.	Rejected
H4a: Men's developmental networks inside the organization are more diverse than the ones of women.	Rejected
H4b: Men place more importance on their developmental network inside the organization than women.	Rejected

H5a: Women's developmental networks outside the organization are more diverse than the ones of men.	Confirmed
H5b: Women place more importance on their developmental network outside the organization than men.	Confirmed
H6: Men have more multiplex relationships with their most important developers than women.	Rejected
H7: From their most important developers men receive more career support whereas women receive more psychosocial support.	Partially confirmed

Discussion

The aim of this study was to reveal gender differences in men's and women's developmental network structures in terms of their size, diversity and multiplexity and thereby investigate if and how this offers explanations for why men are often still more successful than women in today's corporate world.

First, what is striking, when comparing the network structure of men and women, is that men consider only an extremely small amount of women their developers while women receive support from both male and female developers. This confirms previous assumptions and gives support to the research by Gersick et al. (2000) emphasizing that men are connected in a center of other professional men who jointly support each others career, but see women outside this circle. Moreover, it implies that men do not value women in the corporate world as much as they value other professional men, since they rarely ask them for advice and support. Especially the big difference for the amount of female developers between men and women and its large effect size in this study indicate and emphasize that many men have not yet accepted professional women as an equal partner in the corporate world. This lack of acceptance might be one of the main reasons for why women often still experience problems to climb up the corporate ladder.

Moreover, especially outside the organization women have significantly more female developers than men. One explanation for this is the type of support that women likely receive from these developers. Previous research indicates that women exchange psychosocial support among other women, especially with friends and family (Gersick et al., 2000; Higgins & Kram, 2001; Ibarra, 1993; McKeen & Bujaki, 2007). Also women in this

study proved to receive more psychosocial support than men as well as they displayed more connections with family and especially friend developers. An explanation for why women seek for these higher amounts of psychosocial support apart from their stereotypic characteristics is that professional women are more often than men confronted with a conflict between career and family (Chan, 2008; Wang & Cho, 2013). Especially female developers outside the organization, such as friends and family, seem to serve as a developer in this case, as they can be trusted and likely face similar problems, thus understanding the situation.

Another main outcome of this study is that contrary to prior expectations women displayed bigger developmental networks than men. This can be primary explained by the fact that women in contrast to men expand their networks outside the organization, which gives support to previous research of Ibarra (1993; 1997) and Moore (1990). Men and women seem to define their developmental networks differently. While women also consider people outside the organization as their developers and thus have a broader perspective on what their network is, men seem to follow a narrow view and focus more on their contacts inside the organization. Related to this, women also proved to place a higher importance on their developmental networks outside the organization as well as these networks possessed a higher diversity with friends and family than the ones of men. This confirms previous assumptions based on women's stereotypic attributes and social network behavior (Ajrouch et al., 2005; Moore, 1990; Shaw et al., 2006). However, that women build these relationships outside their organizations might be also explained by the fact that they are more often than men taking a time-out from their job and organization for maternity and paternity leave reasons (DAK, 2016). Thus, for women it is more important to look for contacts in different directions in order to find opportunities and ways back to the business world after or during a time-out. The problem with these relationships outside the organization is however that they cannot provide the same information and resources as developers from inside the organization, for they do not possess organizational knowledge (Murphy & Kram, 2010). Therefore, although women have bigger developmental networks, they are not necessarily advantaged towards men, as their contacts outside can encourage their career and life satisfaction, but likely cannot help them to advance to higher positions inside their organization (Murphy & Kram, 2010). In contrast, men who do not spend so much effort and energy on connections outside the organization can concentrate more on their developmental network inside the organization, which likely facilitates their way to climb up the corporate ladder in the organization.

Furthermore, what is also noteowrthy in this study is that although women have to cross gender lines more regularly than men, they are contrary to prior expectations not disadvantaged in terms of their contact to higher hierarchical level or different organizational department developers. Moreover, they also do not face difficulties in receiving career and role modeling support in the same amount as men as well as they even proved to receive a higher variety of support from their developers, at least for a multiplexity degree of three. This is contrary to previous mentoring studies stating that women because of their minority status are confronted with obstacles and thus have less access to mentoring support than men (Abalkhail & Allan, 2015; Fine and Pullins, 1998; Ramaswami et al., 2010; Young et al., 2006). This different outcome to the mentoring literature implies that women benefit from network structures and thus from receiving career assistance from multiple sources instead of getting support only within dyadic mentoring relationships. (Singh et al., as cited in Abalkhail & Allan, 2015). Therefore, this study adds further value to the new developmental network research field.

Overall, the discussed outcomes confirm that a distinction on gender was highly relevant for the developmental network research and thus endorse previous researchers that called for a gender study on developmental networks (Cotton et al., 2011; Dobrow et al., 2011; van Emmerik, 2004).

Practical Implications

As this study revealed and confirmed that there are no significant differences between men and women in their occupational role importance and career ambitions, it stresses the importance of using this female motivation and energy within the business world. Women's career success is highly relevant not only on the individual level, but also for organizations and the society, for they otherwise loose much needed talent and squander valuable human resources (Davidson & Burke, 2011; Littmann-Wernli & Schubert, 2001; Stahlberg et al., 2009). Thus, organizations and politicians have to become active in order to support and enhance women's career development.

One main finding of this study is that many men hardly consider any women as their developer. This implies that although women proved to be not disadvantaged in terms of the type and amount of support they receive as well as the diversity of their developers, they are still not valued as an equal partner in the corporate world by men. Because this lack of

acceptance might be one of the main reasons for why women often still experience problems to climb up the corporate ladder, it is crucial for organizations and the society to actively change the perception and awareness towards female professionals. The political initiative of a fixed rate of women within supervisory boards that was launched in Germany this year is a fist step in this direction (TNS Emnid, 2016). However, in order to change the attitude of people the awareness of female professionals and their success has to be increased in the society. Media campaigns that emphasize the importance of women in the corporate world and display stories of successful women could be one way to do this. Moreover, national-wide awards that honor successful women could increase their acceptance in the business world. In addition, also organizations should become active in their inside and outside communication by emphasizing that they treat men and women equally, for example with presenting success stories, from both men and women in their organization. Furthermore, employing part-time working women and enabling job-sharing in boards and senior management positions would represent an organization's high value and appreciation for female professionals.

Another important outcome of this study is that women in contrast to men build large networks outside their organization, which they also place high importance on. As previously stated these contacts are crucial for women likely in order to find different ways and options to get back to the business world after a time-out for their children. For organizations however it should be of high importance to keep in contact with them in order not to loose these talented professionals. Thus, they should help women to concentrate on and foster their network inside the organization, also during this inactive period. Organizations could for example organize regular events for these female professionals where they can meet with former colleagues, inform themselves about current and relevant topics and plans of the organization as well as they could discuss career opportunities. In addition, organizations could offer the option to start working with reduced working hours. Thereby, women could minimize the period of their time-out from the organization and simultaneously the risk of loosing the contact to people inside the organization while still taking care of their children.

Moreover, in order to reduce the conflict for women between career and family, organizations could offer flexible working schedules and home office possibilities that facilitate the combination of both. Furthermore, also the existence of a company kindergarten can support solving this dilemma. Knowing their children to be in good hands while working likely makes it easier for women to fully concentrate on their career advancement. This might also reduce their higher need for psychosocial support from female developers outside the

organization, as they are more relaxed and balanced; thus, being able to place more importance and focus on developers inside the organization that can push and forward their career.

Limitations and future research

One limitation of this study is that in order to measure the type of support that participants received from their developers a validated support functions scale from the mentoring literature was used. However, various studies have shown that developmental networks provide a broader range of support than mentoring dyads (Cotton et al., 2011; Janssen et al., 2013). Nevertheless, no validated scale has yet been established for developmental network support and the purpose of this study was not to create a new one. Therefore, further research is needed, in order to create a new scale for the support functions provided within developmental networks.

Another limitation within the measurement construct is that this study used egocentric networks to analyze the developmental networks of men and women. However, the threat of this approach is the possibility of a mono-source bias since only one person gives information on all connections within a certain network (Harythornthwaite, 1996). Future research should thus also conduct analyses from the perspective of the developer, for this person likely not only provides, but also receives support and a focus on this mutuality offers an interesting research field (Dobrow et al., 2011).

Moreover, as one of the requirements for participation this study was restricted to people with at least a Bachelor's degree, for it was necessary to ensure a uniform educational background. However, also people with a different than academic education background might strive for a career and build developmental networks. Especially those that did not take the standard way, but are lateral entrants, likely have a high need for support and network structures. Therefore, studies investigating and comparing the developmental networks of people with differing education backgrounds hold additional potential.

A fourth limitation of this study is the high drop-out rate. More than 400 people started filling in the questionnaire, but about 100 did not finish it. Some of these might have restarted and submitted it at a later point in time. Nevertheless, there are still a lot of questionnaires that remained unfinished, although the name generator device has already been successfully used in several other studies on developmental networks (Higgins, 2000; Higgins & Thomas, 2001;

Murphy & Kram, 2010; van Emmerik, 2004). Moreover, the clicking rate of over 700 and private messages to the researcher displayed that people were generally interested in this topic and the questionnaire. However, especially people working are often very busy and lack the time, motivation and energy for this kind of 'extra work'. Thus, future research could distribute similar questionnaires via the human resource department or the head of bigger organizations in order to emphasize its importance with managerial support.

Another related problem that some people likely face when filling in the survey, is that they do not recall all their developers, especially in the short period of time that people normally take to complete an online survey. Thus, the average network size within this study was with six developers quite small, although it was already bigger than the ones of previous studies, that revealed an average network size of four to five developers (Dobrow et al., 2011). In order to avoid this limitation in future research, long-term studies are an option. Here participants could fill in the survey over a longer period of time and add a developer whenever a person comes to their mind, maybe even via an online app in order to be more flexible and mobile.

Furthermore, some organizations are already offering and implementing the suggested ideas from the practical implications section and are thus initiating a process of change for the position and perception of women in the corporate world (Daniels, 2011). Therefore, also the differences between males and females in their developmental networks likely do not remain the same in the next years and thus longitudinal or periodically studies on the developmental network structures of men and women offer an interesting research field (Dobrow et al., 2011).

Conclusion

The present study revealed that men strongly focus on other men and hardly see female professionals as their developers while women receive support from male as well as female developers and are thus crossing gender lines. This implies that men do not value women as much as they value other men in the corporate world. So, although this study showed that contrary to previous mentoring research women are not disadvantaged in terms of the amount and type of support they receive within their developmental networks, many men have not yet accepted women as an equal partner in the business world. Media campaigns and organizational communication that emphasize the success of female professionals as well as

job-sharing and part-time working women in boards and senior management positions could help to change this attitude towards more value and appreciation for female professionals.

Moreover, this study demonstrated that women build bigger developmental networks than men, because they expand and value their outside networks more than men. Especially with other women they build relationships here. This is likely the case, because they have to look in different directions in order to find opportunities and ways back to the business world after and during maternity and paternity leaves as well as they seek psychosocial support from female friends and family to handle their conflict between career and family. This support from outside can help them to enhance their career and life satisfaction. However, developers from outside the organization do not possess the same information and knowledge as insiders and can thus likely not support women to advance to higher positions inside the organization. In order not to loose the contact to qualified female professionals and to foster their career advancement organizations should thus display flexibility and offer reduced working hours minimizing women's conflict as well as shortening the period of their time-out.

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APPENDIX A: MEASURMENT ITEMS

Occupational role importance

1. Having work/ a career that is interesting and exciting to me is my most important life goal.

2. I expect my job/ career to give me more real satisfaction than anything else I do.

3. Building a name and reputation for myself through work/ a career is not one of my life goals. [reversed item]

4. It is important to me that I have a job/ career in which I can achieve something of importance.

5. It is important to me to feel successful in my work/ career.

6. I want to work, but I do not want to have a demanding career. [reversed item]

7. I expect to make as many sacrifices as are necessary in order to advance in my work/ career.

8. I value being involved in a career and expect to devote the time and effort needed to develop it.

9. I expect to devote a significant amount of my time to building my career and developing the skills necessary to advance in my career.

10. I expect to devote whatever time and energy it takes to move up in my job/ career field.

Type of support
Career support
1. He/ She takes a personal interest in my career.
2. He/ She helps me coordinate professional goals.
3. He/ She has devoted special time and consideration to my career.
Psychosocial Support
1. I share personal problems with him/ her.
2. I exchange confidences with him/ her.
3. I consider him/ her to be a friend.
Role modeling support
1. I try to model my behavior after him/ her.
2. I admire his/ her ability to motivate others.
3. I respect his/ her ability to teach others.

APPENDIX B: QUESTIONNAIRE

Welcome!

Please select your language first.

German/Dutch

Dear participant,

First of all, thank you for participating in my survey. It is part of my master thesis at the University of Twente.

Filling in the questionnaire will take about **10 minutes** of your time. The survey will map your developmental network. This networks is formed of people who have taken an active interest in as well as a strong commitment to advance your career by assisting with your personal and professional development. With this survey I want to investigate which differences there are in the structure of men's and women's developmental networks.

Please read the questions carefully and answer **all** questions. The results will be kept **anonymous** and used for **academic purpose only**.

Please only participate if you are of **German or Dutch nationality**, if your highest educational level is **at least a Bachelor degree** (or comparable diploma) and if you are currently in an **employment relationship**.

If you have any further questions or comments, you are welcome to send an email to:

m.l.poschmann@student.utwente.nl

Thank you for your time and participation.

Kind regards,

Maximiliane Poschmann
Master student of the University of Twente

Personal Information

Please answer the following questions.

1. What is your nationality?

German/Dutch

2. What is your gender?

male/ female

3. What is your age in years?

4. What is currently your highest education level?

Bachelor degree (or comparable diploma)/ Master degree (or comparable diploma) or higher

5. How many years have you been working in your occupation since your graduation?

6. How many years have you been working for the organization you are currently working for?

7. In what branch is your organization operating? (Examples: Financial, health care, education, marketing, etc.)

8. What is your occupation within your organization? (Examples: Engineer, professor, consultant, nurse, etc.)

9. What is your current managerial level?

Non-manager/Low-level manager/ Middle-level manager/ Top-level manager

10. How many people are employed by your current organization?

Under 100/ 101-500/ 501-1.000/ 1001-5.000/ 5001-9.999/ over 10.000

Occupational role importance

On a 5-point Likert scale ranging from 1 (disagree) to 5 (agree) please rate the following statements.

1. Having work/ a career that is interesting and exciting to me is my most important life goal.
2. I expect my job/career to give me more real satisfaction than anything else I do.
3. Building a name and reputation for myself through work/ a career is not one of my life goals.
4. It is important to me that I have a job/ career in which I can achieve something of importance.
5. It is important to me to feel successful in my work/ career.
6. I want to work, but I do not want to have a demanding career.
7. I expect to make as many sacrifices as are necessary in order to advance in my work/ career.
8. I value being involved in a career and expect to devote the time and effort needed to develop it.
9. I expect to devote a significant amount of my time to building my career and developing the skills necessary to advance in my career.
10. I expect to devote whatever time and energy it takes to move up in my job/ career field.

Developmental network size

- *Please list the people **inside the organization** who during the last year have taken an active interest in as well as a strong commitment to advance your career by assisting with your personal and professional development.*
- *This includes people who have acted on your behalf, provided you with information, career opportunities, advice or psychosocial support or with whom you have regularly spoken regarding difficulties at work, alternative job opportunities, or long-term career goals.*
- *You can use their **names or initials**, as long as these people are **identifiable** for yourself in the next questions. Use as many of the rows as you need.*

A

B

C

D

E

F

G

H

I

J

- *Please, list the people **outside the organization** who during the last year have taken an active interest in as well as a strong commitment to advance your career by assisting with your personal and professional development.*
- *This includes people who have acted on your behalf, provided you with information, career opportunities, advice or psychosocial support or with whom you have regularly spoken regarding difficulties at work, alternative job opportunities, or long-term career goals.*
- *You can use their **names or initials**, as long as these people are **identifiable** for yourself in the next questions. Use as many of the rows as you need.*

K

L

M

N

O

P

Q

R

S

T

Developmental network diversity

*Please complete the following information on people **inside the organization** you named under A to J (names are automatically forwarded from the previous question).*

	Gender	Hierarchical level *(in proportion to yourself)*	Organizational department *(in proportion to yourself)*
Peter	Male/female	Lower/same/higher	Same/different
Sarah			
Anna			
…			

*Please complete the following information on people **outside the organization** you named under K to T (names are automatically forwarded from the previous question).*

	Gender	Social area *(you initially know this person from)*
Maria	Male/female	Family/friends/studies/business
Suzanne		
Michael		
Torben		
M. K.		
S. T.		
..		

Ranking

- *From all the people you previously named to be your developers (inside **and** outside your organization), please, name those 6 you consider to be the most important for you.*
- *Start with the most influential one.*

- *In case you previously named less than 6 developers, please sort the developers you named by their importance for you.*

	Name	This developer stems from inside or outside the organization
1		Inside/Outside
2		
3		
4		
5		
6		

Type of support/ Developmental network multiplexity

On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your ***most important*** *developer in order to reveal the kind of support this person provides you with.*

1 takes a personal interest in my career.
1 helps me coordinate professional goals.
1 has devoted special time and consideration to my career.
I share personal problems with 1.
I exchange confidences with 1.
I consider 1 to be a friend.
I try to model my behavior after 1.
I admire 1's ability to motivate others.
I respect 1's ability to teach others.

On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your ***second most important*** *developer in order to reveal the kind of support this person provides you with.*

2 takes a personal interest in my career.
2 helps me coordinate professional goals.
2 has devoted special time and consideration to my career.
I share personal problems with 2.
I exchange confidences with 2.
I consider 2 to be a friend.

I try to model my behavior after 2.

I admire 2's ability to motivate others.

I respect 2's ability to teach others.

*On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your **third most important** developer in order to reveal the kind of support this person provides you with.*

3 takes a personal interest in my career.

3 helps me coordinate professional goals.

3 has devoted special time and consideration to my career.

I share personal problems with 3.

I exchange confidences with 3.

I consider 3 to be a friend.

I try to model my behavior after 3.

I admire 3's ability to motivate others.

I respect 3's ability to teach others.

*On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your **fourth most important** developer in order to reveal the kind of support this person provides you with.*

4 takes a personal interest in my career.

4 helps me coordinate professional goals.

4 has devoted special time and consideration to my career.

I share personal problems with 4.

I exchange confidences with 4.

I consider 4 to be a friend.

I try to model my behavior after 4.

I admire 4's ability to motivate others.

I respect 4's ability to teach others.

*On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your **fifth most important** developer in order to reveal the kind of support this person provides you with.*

5 takes a personal interest in my career.

5 helps me coordinate professional goals.

5 has devoted special time and consideration to my career.

I share personal problems with 5.

I exchange confidences with 5.

I consider 5 to be a friend.

I try to model my behavior after 5.

I admire 5's ability to motivate others.

I respect 5's ability to teach others.

On a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) please complete the following information for the person you named in the previous question as your ***sixth most important*** *developer in order to reveal the kind of support this person provides you with.*

6 takes a personal interest in my career.

6 helps me coordinate professional goals.

6 has devoted special time and consideration to my career.

I share personal problems with 6.

I exchange confidences with 6.

I consider 6 to be a friend.

I try to model my behavior after 6.

I admire 6's ability to motivate others.

I respect 6's ability to teach others.

This is the end of the questionnaire. If you have filled in everything, please click on the 'submit' button to save you answers. Thank you for participating!