Workplace friendships of men and women: examining employee gender, manager gender and gender composition in European workplaces

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Workplace friendships of men and women: examining employee gender, manager gender and gender composition in European workplaces

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Abstract

Purpose – The study investigates gender differences in workplace friendships, focusing on the number of friends, the gender of friends and the extent of same-gender friendships accounting for workplace characteristics shaping these differences.

Design/methodology/approach – We used three-level data (employees nested in departments and organizations) from six different sectors across nine countries and multilevel mixed-effects models to test the hypotheses.

Findings – The results indicate that women have more workplace friends than men. Given sufficient opportunities, both men and women prefer same-gender workplace friendships. Moreover, when having a manager of the same gender, not only men but also women have significantly more same-gender workplace friends.

Originality/value – This study contributes to the understanding of workplace friendships by employing unique data from 2,620 employees across various organizations and different sectors. Additionally, it provides insights into how organizational contexts can shape friendship networks among employees and gender dynamics therein.

Keywords Friendship, Workplace friendship, Workplace relationships, Gender, Organizations, Homophily

Paper type Research paper

Introduction

Many people do not work in isolation but are socially embedded in their workplace. Prior research shows that social networks are associated with relevant outcomes like salary (Markiewicz *et al.*, 2000), performance (Methot *et al.*, 2016) and promotions (Burt, 1998; Woehler *et al.*, 2021). These social networks do not only consist of the formal, organization-prescribed relationships between job roles but men and women [1] also form informal, voluntary relationships, which foster collaboration, are central for organizational functioning and provide social support and inclusion (Morrison and Cooper-Thomas, 2017). A common type of informal relationship is workplace friendships (WPF), characterized by combining a formal work relationship with a friendship. Given this combination, they inherently provide both instrumental and affective benefits. For example, they not only make work more

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enjoyable (Rawlins, 1992), but also allow individuals to mobilize the resources of others which help them to perform better and get ahead at work (Lin, 1999). Prior research shows that men and women differ in how and with whom they form, behave within and utilize their informal social networks at work (Fang *et al.*, 2021; Ibarra, 1992, 1993). In and outside the workplace, men mainly use their relationships for instrumental benefits, while women focus additionally on social and emotional support alongside instrumental benefits (Apostolou *et al.*, 2021; van Emmerik, 2006). However, how these differences specifically apply to WPF remains underexplored (Horan *et al.*, 2021). Therefore, this study aims to investigate gender differences in WPF and examine how they are shaped by the organizational context.

It matters whether or not employees have WPF, as WPF play a crucial role for both individuals and organizations. Coworkers frequently need to collaborate and exchange resources with each other and WPF facilitate these behaviors, helping them to achieve goals (Stackman and Pinder, 1999). Studies have shown that WPF are associated with several positive outcomes for both, the individual and the organization. People with more WPF are less often the target of negative gossip, WPF indirectly reduce stress, foster team member well-being and collaboration, increase perceived employee productivity and quality of work and enhanced perceived job significance, and organizational commitment, while they decrease employee absenteeism and turnover intentions (Berman *et al.*, 2002; Ellwardt *et al.*, 2012; LePine *et al.*, 2012; Liu *et al.*, 2019; Mao *et al.*, 2012; Pedersen and Lewis, 2012). Further, research shows that groups of friends tend to perform better than those composed of non-friends, as friendships improve coordination and motivation within teams (Chung *et al.*, 2018). WPF are an important part of the informal network of an organization (Markiewicz *et al.*, 2000). Informal networks are the glue that keeps organizations together, facilitate resource sharing and cooperation and allow for an organizational culture to emerge. Investigating how men and women potentially differ with respect to WPF, a part of this informal structure, helps to understand, if and how men and women may experience segregated informal networks, which may block access to resources for some or lead to the emergence of conflicting norms.

It also matters whom one has as a WPF because the friend's gender likely impacts both, the nature of the friendship as well as potential benefits associated with it. Not everyone has equal access to organizational resources, which means that some WPF are more valuable than others. While it has been shown, that there are gender differences in the correlation between WPF and organizational outcomes (e.g. job satisfaction; Morrison, 2009), many studies on WPF pay little attention to the friend's gender (Morrison and Cooper-Thomas, 2017). One exception, Markiewicz *et al.* (2000), documented gender differences in friendship network size and found, that whether men or women were judged more favorably as WPF depended on the workplace. However, their study was limited to only three workplaces and was thus not suited for a systematic investigation of the role of the organizational context.

Previous research shows that who is friends with whom is dependent on individual (e.g. gender), and workplace characteristics (e.g. composition; Kram and Isabella, 1985; Sias and Cahill, 1998; Zarankin and Kunkel, 2019). Like many other types of relationships (e.g. marriage, general friendships), WPF are guided by the principle of homophily, which describes that similarity breeds connection and that people are attracted to similar others (McPherson *et al.*, 2001). Focusing on WPF, gender is an important dimension of similarity. Research shows that many WPF are same-gender relationships (Horan *et al.*, 2021) and that such relationships tend to be stronger (Markiewicz *et al.*, 2000). At the workplace, people cannot decide with whom to work together and the gender composition of the workforce limits the opportunity structure for WPF, so men and women potentially differ in their chances of finding same-gender contacts. Additionally, the question of who is a valuable WPF largely depends on the organization's power structure which defines who has access to what resources. On the one hand, organizations reflect broader societal power dynamics, mirroring the prevailing status hierarchies within society. On average, men still have more status, power and resources in organizations and are therefore often of greater instrumental value and thus potentially more attractive as WPF. In line with this argument, having more male WPF is associated with higher

salaries while having more female WPF is negatively associated with financial outcomes (Markiewicz *et al.*, 2000). Combining the preference for gender homophily with a gendered power structure in organizations could place women in a disadvantaged situation as their preferred WPF may lack specific status-related instrumental resources. This can make their friendships less beneficial (Ibarra, 1992), potentially reinforcing gender inequalities. On the other hand, organizations can both reinforce and mitigate existing gender inequalities in status-related resources, depending on their structure and practices. As such, organizations serve as the sites where societal inequalities are enacted, though the extent to which they do so may vary across different organizations. For example, having a female manager could signal that women can have access to power and resources and could improve their status, thereby increasing their attractiveness as WPF. While this study does not test the returns from WPF patterns, we investigate potential variation between organizations by focusing on the following research question: *Are there gender differences in workplace friendships, and do these differences vary with respect to characteristics of the workplace?*

We contribute to the literature in three ways. Firstly, we extend the scope of prior studies by not only investigating the number of WPF but also potential gender differences in the number of same/different-gender friends, and gender homophily in the WPF network. By including these different measures in our analyses we aim to provide more nuanced insights into patterns of informal relationships. Secondly, we empirically test two theoretically relevant workplace characteristics as moderators (gender composition, and manager's gender), which help to understand how gender differences may vary across different organizations.

Thirdly, the rich "European Sustainable Workforce Survey" provides information on employees in different organizations, sectors and countries, allowing us to study WPF on a large scale, and extending the scope of prior small sample and single firm or single sector studies (e.g. Ibarra, 1992; Markiewicz *et al.*, 2000; Stackman and Pinder, 1999).

Workplace friendships

WPF are relevant to an interdisciplinary audience, including scholars in Management, Communication, Psychology, Personal Relationships, Organizational Behavior, Sociology and Gender Studies (Chory and Horan, 2023). Previous studies placed focus on the development of WPF (Sias and Cahill, 1998), potential tension experiences (Bridge and Baxter, 1992), gender differences in attitudes, as well as ideal and actual friendship experiences (Devine and Markiewicz, 1990; Sapadin, 1988). Management and sociology scholars often use social network analysis to investigate WPF (Hood *et al.*, 2017; Methot *et al.*, 2016; Tasselli and Kilduff, 2018).

Although WPF are somewhat differently labeled in the literature (e.g. business friendships, work friends), they essentially describe a voluntary relationship between co-workers which comprises a professional and a personal element and in this way span professional and private lives (i.e. blended relationships; Chory and Horan, 2023). Based on the notion that all peer relationships at work serve some instrumental and career-enhancing functions (Kram and Isabella, 1985), WPF are defined by the addition of an affective component to the relationship. Foundational work on WPF emphasizes their significant instrumental functions for both, the organizations (e.g. enhanced employee commitment) and the employees (e.g. career development; Rawlins, 1992). Due to their multi-layered nature, WPF are comparatively strong and related to high trust and reliability (Ibarra, 1993, 1995; Liu *et al.*, 2019).

Compared to other relationships at the workplace (overview in Genkin *et al.*, 2022), WPF are distinct because of the combination and interaction of the two types of relationships. Firstly, the instrumental relationship is structured around the job role and the exchange of job-related resources (e.g. information, expertise, material resources) and in this way linked to employee performance. Secondly, the affective relationship fulfills the psychological need for social connection, provides support and is associated with well-being at work (LePine *et al.*, 2012; Zarankin and Kunkel, 2019). The affective relationship can enhance the instrumental one, as it motivates individuals to share resources and seek help, thereby positively impacting work

performance and career advancement (Ibarra, 1997). Investigating task-related networks in multiple organizations Casciaro and Lobo (2008) show that it is not competence but active liking of co-workers that is necessary to contact them and to ask for access to their organizational knowledge. Compared to friendships outside the workplace, which can offer general support, WPF have a unique set of resources, due to a shared understanding of the workplace and physical proximity during work hours. For example, WPF help to identify and discuss opportunities within the organization, share career-relevant information and can use their influence in a way that benefits their friends (Rawlins, 1992). Knowing the workplace and other employees, they can offer specific advice on handling difficult situations or people, and provide immediate support in challenging moments. When co-workers provide emotional support beyond simple conversations, people tend to view them as friends (Agneessens *et al.*, 2006).

Gender differences in WPF

Research on friendships outside of work suggests that while friendships of men and women share many similarities (Wright, 1988), there are consistent patterns of gender differences (Markiewicz *et al.*, 2000; Sapadin, 1988; Winstead, 1986; Wright, 1982). Women friendships are described as "face-to-face relationships" in which interaction is more dyadic than group-oriented, involving confiding, personal concerns and empathetic communication. Men's friendships are described as "side-by-side", instrumental and agentic. Their communication is characterized by lower self-disclosure, while the interaction is more aggressive, competitive and oriented towards the exchange of external information (e.g. sport/work). Activities are often structured around shared interests and are action-rather than person-oriented (Sapadin, 1988).

Many people experience work-related stress (Griffin and Clarke, 2011). Women's stress reaction includes the creation and maintenance of social networks, and they tend to seek social and emotional support from coworkers when distressed (Taylor *et al.*, 2000). This social behavior is expected to facilitate WPF while in contrast, men's stress reactions do not specifically promote WPF because of general tendencies of lower disclosure and higher competitiveness. Furthermore, men and women seem to evaluate the importance of friendships in the workplace differently. For men, WPF increase satisfaction, yet they are not dissatisfied when they lack them. For women, WPF do not increase satisfaction but their absence leads to dissatisfaction (Herzberg, 2017; Morrison, 2009). Based on these arguments, we expect that general friendship patterns of men and women also apply to the workplace, and further that workplace-specific behavior of women promotes WPF.

H1a. Women tend to have more WPF than men.

Besides the number of friends, the friend's gender plays a central role. The concept of homophily is central to understanding the impact of gender in WPF (Winstead and Morganson, 2009). Homophily describes the tendency for people to connect with others who are similar to themselves, serving as a key organizing principle of social relationships across various relationship types (McPherson *et al.*, 2001). Studies on general adult friendships show that men and women appreciate different aspects of friendships, different kinds of interactions and they provide different kinds of support to their friends. Specifically, men tend to be more motivated to build general friendships to derive opportunistic benefits from them (e.g. career advancement), while women value the support and social input gained from friendship more (Apostolou *et al.*, 2021). Furthermore, women are on average more satisfied with their friendships, have more intimate friendships and experience friendships with other women as most rewarding (Sapadin, 1988).

Extensive research on homophily in the workplace demonstrates that same-gender relationships develop more easily and that many WPF are same-gender relationships (Brass, 1985; Horan *et al.*, 2021; Markiewicz *et al.*, 2000; McPherson *et al.*, 2001). Especially in the initial stages of WPF development, perceived similarity plays an important role (Sias and

Cahill, 1998), and gender is an important dimension of similarity (Winstead and Morganson, 2009). These findings suggest that the friendship needs, expectations and attitudes of women are best met by other women, and those of men by other men.

H1b. Women tend to have more female WPF than men.

H1c. Women tend to have fewer male WPF than men.

Same-gender WPF likely represent the majority of WPF, however, men, and women could vary in their share of such. While both, men and women provide instrumental resources to their WPF, the nature of these resources might differ. In today's organizations, men still have more power and resources, so social relationships with men are, on average more beneficial in an instrumental way. Although WPF always serve some instrumental function—even purely emotional support can help employees to cope and perform better—certain high-value instrumental resources (e.g. career advancement opportunities) are often controlled by men. In contrast, the instrumental resources provided by women (e.g. task support) might contribute less directly to career advancement. While men may find different kinds of instrumental and affective resources in their gender-homophilous relationships, women could rely on their gender-homophilous relationships for affective resources but may need to turn to men for certain instrumental resources, as they cannot extract equal benefits from their homophilous relationships. At the workplace, people make strategic choices about relationship investments (Ibarra, 1993). For that reason, women might have more different-gender WPF than men, despite their equal preference for homophily. This is not the case for men, as they have higher chances of having homophilous and simultaneously instrumentally beneficial relationships. Findings of previous research suggested that men have more homophilous, and women have more heterophilous friendship networks in organizations (Ibarra, 1992, 1993, 1997; Woehler *et al.*, 2021). In line with this argument, we expect women to have more WPF (H1a), and more female WPF (H1b) in comparison to men. To ensure access to organizational resources, women might have additional WPF with men, which reduces their overall homophily in WPF. For example, when comparing a male employee having two male WPF, to a female employee having one male and two female WPF, the woman would have a higher number of WPF, a higher number of female WPF but less homophily in WPF.

H1d. Compared to men, women have on average less homophily in WPF.

WPF and characteristics of the workplace

While gender differences in WPF are often attributed to gendered socialization and are thus somewhat stable, structural explanations focus on the impact of the workplace on gender differences in WPF (e.g. Ibarra, 1992; Markiewicz *et al.*, 2000). Organizations are not only viewed as containers of social relationships, but their culture can actively influence the formation and existence of WPF (Sias and Cahill, 1998). While individual factors like personality and perceived similarities are especially important at the beginning of friendship formation, characteristics of the workplace which determine proximity and frequency of interaction among co-workers, fundamentally impact WPF in the long-term (Morrison and Cooper-Thomas, 2017).

We deem two characteristics of the workplace central in shaping gender differences in WPF: (1) the "opportunity structure" or share of women; and (2) the "distribution of power" or having a female manager. Firstly, the opportunity structure to build and maintain WPF constrains employees in the sense that they have little to no choice with whom to work together, have frequent contact and have proximity, as co-worker relations are prescribed by the formal structure of the organization. Organizations or single departments differ in gender representation and are often not gender heterogeneous (McPherson *et al.*, 2001). This implies that the possibility of following personal and homophily preferences in WPF is limited by the availability of suitable contacts. In other words, the question is whether women have enough

female coworkers who are in proximity and suitable as potential WPF. Here, both a sufficient absolute number of female employees as well as the share of women impact the opportunity structure. With increasing numbers of female employees, the opportunity structure for women becomes better and they are expected to have more female WPF, which also increases their total number of WPF.

H2a. The more women in the department the stronger the positive link between being a woman and the number of WPF.

H2b. The more women in the department the stronger the positive link between being a woman and the number of female WPF.

The second important aspect is related to the hierarchy and distribution of power and resources in the organization and to the question of whether or not women are represented in management positions. The gender of the manager might influence the relationship between gender and WPF in several ways. Men and women differ in their leadership style with women being less central in their teams and leading more democratically, emphasizing consensual relationships (Appelbaum *et al.*, 2003; Claes, 1999; Eagly and Johannesen-Schmidt, 2001; Webster *et al.*, 1999). They contribute to enhanced communication, cooperation and team spirit, as well as supporting a climate that is less competitive and that presumably fosters positive social relationships among team members. Thus, in teams with a female manager, opportunity structure and culture might support the development of WPF for both men and women. Research shows that women (van Hek and van der Lippe, 2022), as well as men (Moore *et al.*, 2005), report higher levels of social support when having a female manager. We expect the magnitude of this effect to differ between men and women, particularly supporting men in having WPF by increasing interaction and interdependence among team members, while maintaining low levels of competition. In this way, female managers could have an equalizing effect on the gender differences in the numbers of WPF.

H3a. Compared to teams with a male manager, in teams with a female manager the positive effect of being a woman on the number of WPF is weakened.

Secondly, we expect the association between gender and homophily in WPF, is dependent on the manager's gender. Women might not always be desired as WPF for their lack of instrumental resources. In organizations with few or no women in leadership positions, employees may perceive that women have limited access to resources and that men hold the majority of status and power. The absence of female role models in senior positions could signal that being a woman is a liability, which negatively influences the potential for identification and the attractiveness of female WPF (Ely, 1994). Yet, having women in supervisory positions may change the situation as a female manager implicitly transmits information about an organization's power distribution and signals to others that being female and having power and resources are compatible, thereby increasing women's status and their attractiveness as WPF.

Following the arguments above we expect that a female manager influences homophily in WPF for men and women differently. For women, a female manager signals that resources can be possessed by women which increases their attractiveness as WPF, while simultaneously lowering the necessity to have contact with men for instrumental support. Thus, we expect a stronger positive link between being a woman and higher levels of homophily in WPF, when having a female manager. For male employees, on the other hand, a female manager signals that women can be valuable WPF. Without the liability of lower status, women's friendship qualities of emotional support and closeness might make them the better WPF, so men might consider WPF with women more often, reducing homophily in WPF. We thus hypothesize contrasting effects on WPF homophily for men and women:

H3b. In departments with a female manager (vs male manager), the homophily tendency in WPF is strengthened for women and weakened for men.

Research design

Data

The hypotheses are tested using cross-sectional data from the "European Sustainable Workforce Survey" (wave 2; Van der Lippe *et al.*, 2022). The ESWS is part of the "Sustainable Workforce" research project that explores the role of organizations in fostering and investing in a sustainable workforce. The survey was initiated and organized by the University of Utrecht and carried out in cooperation with partners from all participating countries. Data was collected in 9 European countries (Bulgaria, Finland, Germany, Hungary, the Netherlands, Portugal, Spain, Sweden and the United Kingdom) in 259 differently sized organizations (40–99 employees, 100–249 employees, 250+ employees) from six organizational sectors (financial services, health care, higher education, manufacturing, telecommunications and transportation) between March 2018 and January 2019. The data combines information on three levels: employees nested in departments and organizations. The ESWS consists of three instruments: the Organization Questionnaire (OQ), the Manager Questionnaire (MQ) and the Employee Questionnaire (EQ). HR managers provide information on the organization as a whole, while managers and employees give information on themselves and their departments. 101 (39%) organizations from the first wave participated again and 12 Bulgarian organizations were added to compensate for dropouts. In wave 2, a total of 8,017 employee questionnaires, 586 manager questionnaires and 113 organization questionnaires were distributed and yielded response rates of 54% (EQ), 64% (MQ) and 89% (OQ) resulting in a sample of 4,345 employees in 376 departments in 101 organizations. Additional information about the data can be obtained from the codebook (van der Lippe *et al.*, 2022).

The second wave of the ESWS was used because it included name generator items on affective networks of employees which we used to identify WPF. This item was not included in the first wave of the survey. According to privacy guidelines, this information is anonymized so that only the number of co-workers and their gender is provided. The department-level variables "share of women in the department" and "female manager" have quite high numbers of missings, which explains the reduced observations in the final sample. Listwise deletion was used to obtain the final sample which includes 2,606 employees in 260 departments in 98 organizations. Note that for the analysis of homophily of WPF, a smaller sample is used including only the 726 employees who have at least one WPF.

Measures

Dependent variables. Using the employee survey, four different measures of the dependent variable were created. "*Number of WPF*", describes the sum of workplace friends an employee has. As discussed above, there are different theoretical definitions of WPF and inconsistent operationalizations in the literature, so operationalizations range from asking respondents who they have worked closely with to who they would consider close friends (e.g. Lincoln and Miller, 1979; Markiewicz *et al.*, 2000), to indicating for each team member whether they are considered to be a friend (e.g. Hood *et al.*, 2017). We conceptualized a WPF as relationships at the workplace that involve liking and voluntariness beyond the functions and relations that the organization assigns to its employees. We use the affective network data of the ESWS, consisting of two items "*Whom in your department do you also see outside work?*" and "*Whom do you like to work with in your department?*". Respondents can name up to three colleagues under each item. The variable number of WPF combines both items, counting all mentioned unique names, and ranges from 0 to 6. The first item is a measure adapted from other friendship-at-work measures such as Ibarra (1992). While Ibarra's measure allowed respondents to list as many friends as they wished, male respondents indicated an average of 3.4 WPF and female respondents 2.3 WPF showing the typical magnitude of WPF. As name generator questions can be very demanding for respondents, we decided to limit answers to a maximum of three names per item to balance efficiency/respondent effort and data quality. In addition to the first item, we also included the item "liking to work together", to capture the

affective component within WPF, even when these relationships do not extend outside of work. Including this item is particularly relevant for the investigation of cross-gender relationships where extending the friendship to outside the workplace might be a bigger hurdle due to concerns that such interactions could be misinterpreted as romantic interest by the friend or others (Horan *et al.*, 2021; Sias *et al.*, 2003). The names' gender is obtained by a three-step gender identification strategy combining information provided by organizations, machine processing based on the "World Gender-Name Dictionary" and manual gender assignment (Van der Lippe *et al.*, 2022). The WPF's gender is used in the second and third variables "*female WPF*" and "*male WPF*", representing the number of female and male WPF an individual has. The fourth measure "*homophily*", describes the ratio of male and female friends relative to the respondent's gender (same-gender WPF/all WPF) and ranges from 0 (no homophily) to 1 (total homophily). For example, a female respondent with one male and two female WPF has a homophily score of 0.66.

Independent variables. The main independent variable "*female*" is assessed in the employee questionnaire with the question "*Are you male or female?*" and recoded as a dummy variable with values 0 (male) and 1 (female). The variable "*share of women in the department*" is measured at the department level, using the information of the manager survey item "*How many employees in your department are female?*" with the answer categories 0 – none, 1 – 1–9%, 2 – 10–19%, 3 – 20–39%, 4 – 40–59%, 5 – 60–79%, 6 – 80–89%, 7 – 90–99% and 8 – all. The variable share of women in the department is treated as continuous in the multivariate analysis.

The dummy variable "*female manager*" uses the gender item of the manager questionnaire and shows whether an employee has a male (0) or a female manager (1).

In the analyses, we control for the following variables: "*years in the organization*" and "*years in the department*" are metric variables displaying the respondent's answers to the questions "*How many years have you been working for this organization?*" and "*How many years have you been working for this department?*". We control for these variables as longer years might be linked to a higher likelihood of having friends. The variable "*age*" (in years) is added as a control variable because younger employees potentially have more WPF than older employees. Prior research shows that being a parent has consequences for time spent with friends (Pedersen and Lewis, 2012). Therefore, we include the variable "*child*" ("*Do you have children living at home?*"). The more time one spends in the organization the more occasions there are for building and maintaining friendships, thus we control for "*working from home*". Furthermore, we control for other potential influences on the outcomes of interests including "*years of education*", the "*number of employees in the department*" and the dummy variables "*country*" and "*sector*" (*Manufacturing (ref.), Health Care, Higher Education, Transport, Financial Services, Telecommunications*).

Analytical strategy

We estimate 3-level mixed-effects regression models to test the proposed hypotheses. Multilevel models are chosen because of the hierarchical structure of the data (employees nested in departments, nested in organizations). Accordingly, we expect differences between employees of the same department/organization to be smaller than differences between employees of different contexts. Not accounting for this context dependency could lead to bias and a poor quality of coefficients and standard errors. For the three dependent variables number of WPF, female WPF and male WPF mixed-effects negative binomial regression models are most suitable because they are overdispersed (variance > mean) count variables (max. 6; Twisk, 2019). It is important to account for present overdispersion as it invalidates the statistical inference of the models when neglected (Guimarães, 2005). We report the effects as incidence rate ratios (IRR) for better interpretability. Comparisons of the mixed-effects negative binomial model and mixed-effects Poisson model supported the existence of overdispersion as well as the appropriateness of the model choice in terms of fit [2] (Perumean-Chaney *et al.*, 2013). Moreover, there is significant variation on organization-, department-

and employee-level supporting the choice of multilevel models shown by lower values of the Akaike Information Criterion (AIC). For the dependent variable homophily, mixed-effects linear regression models are used. In these models, random effects for female [3] are included to allow for variation of the gender effect between departments and organizations, and all variances and covariances are estimated distinctly which improves model fit and is recommended when testing cross-level interactions (Heisig and Schaeffer, 2019).

Results

Descriptive analysis

Observations of the first dependent variable number of WPF range from 0 to 6, with employees on average having a number of 0.64 WPF (see Table 1). The largest group of individuals indicates that they do not have any WPF (72.14%), followed by 2 WPF (9.98%), 3 WPF (7.18%), 1 WPF (7.14%), 4 WPF (2.49%), 5 WPF (1.00%) and 6 WPF (0.08%). In the bivariate analysis, men and women do not differ significantly with respect to their number of WPF ($\chi^2(6, N = 2{,}606) = 10.5250$, $p = 0.104$). On average, women have 0.63 WPF and men 0.65 WPF. Furthermore, women on average have more female WPF (0.44) than men (0.16) and men have more male WPF (0.49) than women 0.18). Concerning the average homophily scores, both, men (0.75) and women (0.71) show homophily in their WPF.

Multivariate analysis

To investigate potential gender differences in WPF outcomes, mixed-effect models are presented and interpreted in the following section. Tables 2 and 3 show mixed-effect negative binomial models with the outcomes WPF as well as female and male WPF. In Table 4 the results of the mixed-effect models with the outcome homophily are presented. For the first set of hypotheses on the association between gender and the number of WPF, we expected women to have more WPF than men (H1a). Table 2 models 1 and 2 show that women have significantly more WPF, even when controlling for years in the organization, years in the department, age, years of education, sectors, children, working from home and country ($IRR = 1.324$, $p < 0.001$). The incident rate ratios can be interpreted as follows: in comparison to men, women have 1.324 times more WPF than men. In other words: for every WPF, a man has, a woman has 1.324 WPF. We also find support for our expectations that women have significantly more female (H1b; $IRR = 2.499$, $p < 0.001$), and less male WPF (H1c; $IRR = 0.704$, $p = 0.001$; Table 3 model 2 and 6). As suggested by the bivariate analysis, we do not find support for hypothesis H1d, that women have lower levels of homophily in WPF. Table 4 Model 2 shows a small and insignificant coefficient of female ($IRR: -0.045$, $p = 0.311$), demonstrating no gender difference in homophily. Hence, we accept H1a, H1b and H1c and reject H1d.

The second set of hypotheses states that the association between being a woman and both, the number of WPF and the number of female WPF, varies with the share of women in the department. Against our expectations, higher shares of women do not strengthen the association between gender and number of WPF (H2a; Table 2 Model 4). Looking at the number of female WPF, the share of women in the department significantly moderates the gender effect, but in the opposite direction as expected. The higher the share of women, the weaker the association between being female and female WPF (Table 3 Model 4; $IRR = 0.788$, $p < 0.001$). While we find a positive association between the share of women in the department and the number of female friends, it is not the case that this association is stronger for women. Thus we reject H2a and H2b.

The last two hypotheses expect that the gender effect of WPF outcomes is dependent on the manager's gender. For teams with a female manager, we expected a weaker association between being female and the number of WPF (H3a; Table 2 Model 5). This hypothesis was not supported by the data. Yet, we found that the association between gender and homophily

Table 1. Descriptive statistics of the central variables

Variables	Mean/ %	SD	Minimum	Maximum
Number of WPF	0.64	1.18	0	6
Number of female WPF	0.33	0.80	0	5
Number of male WPF	0.31	0.77	0	5
Homophily	0.72	0.36	0	1
Female	0.59		0	1
Share of women department			0	8
None	4.68			
1–9%	9.02			
10–19%	7.33			
20–39%	11.09			
40–59%	16.00			
60–79%	16.00			
80–89%	17.61			
90–99%	10.86			
All	7.41			
Female manager	0.44		0	1
Years in the organization	11.99	10.70	0	60
Years in the department	8.85	8.73	0	49
Age	44.57	11.46	19	79
Years of education	13.60	3.62	3	21
Number of employees	86.34	226.85	1	1750
Sector (%)			0	6
Manufacturing	31.66			
Health care	25.02			
Higher education	21.72			
Transport	9.36			
Financial services	6.02			
Telecommunication	6.22			
Child	0.51		0	1
Work from home (%)			0	6
(Almost) never	70.84			
Less monthly	10.90			
Less weekly	6.83			
Weekly	4.83			
2 days/week	3.15			
3 days/week	1.38			
4 or 5 days/week	2.07			
Countries (%)			1	9
UK	1.30			
Germany	4.53			
Finland	2.38			
Sweden	9.13			
Netherlands	20.03			
Portugal	2.61			
Spain	5.03			
Hungary	14.43			
Bulgaria	40.56			

Source(s): Table by authors

significantly differs between teams with a female and teams with a male manager (H3b). Having a female manager, strengthens the homophily tendency of women, while it weakens it for men (Table 4 Model 4; Figure 1). In departments with a male manager, women have on average lower homophily in WPF ($b = -0.271$, $p < 0.001$), while in teams with a female

Table 2. Regression coefficients predicting number of WPF (mixed-effects negative binomial regression; incidence-rate ratios, standard errors in parentheses)

	(1) Without controls	(2) With controls	(3) Department characteristics	(4) Interaction share of women	(5) Interaction female manager
Female (Ref: male)	1.312**	1.324***	1.310**	1.467*	1.420**
	(0.180)	(0.105)	(0.105)	(0.265)	(0.146)
Share of women department			1.06	1.073	1.057
			(0.043)	(0.047)	(0.043)
Female manager			0.764	0.770	0.871
			(0.124)	(0.126)	(0.168)
Female × share of women department				0.972	
				(0.039)	
Female × female manager					0.820
					(0.131)
Controls included		x	x	x	x
Constant	0.183	1.137	0.923	0.893	0.879
	(0.045)	(1.182)	(0.967)	(0.364)	(0.922)
Dispersion parameter	−0.584	−0.657	−0.657	−0.664	−0.664
Random effect variances					
Organization-level	4.489	3.312	3.308	3.308	3.307
	(0.997)	(0.740)	(0.737)	(0.738)	(0.737)
Department-level	0.214	0.194	0.178	0.183	0.178
	(0.068)	(0.064)	(0.061)	(0.062)	(0.061)
AIC	4543.383	4534.891	4535.728	4537.24	4536.186
Log-likelihood	−2266.691	−2237.446	−2235.864	−2235.62	−2235.093

Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
N(Organizations) = 98; N(Departments) = 260; N(Employees) = 2,606
Controls: years in the organization, years in the department, age, years of education, number of employees, sector, children, work from home, country
Source(s): Table by authors

manager, they have on average higher homophily ($b = -0.271+0.583 = 0.312$, $p < 0.001$). Controlling for all variables in the model, the average homophily score for women with a male manager is 0.577, for women with a female manager 0.758, for men with a male manager 0.849 and for men with a female manager 0.447. While when having a female manager, women reach levels of homophily closer to those of men with a male manager, men with a female manager still have higher homophily than women with a male manager. These findings support the argument, that women have generally equal preferences for homophily, but have less homophilous WPF in contexts where male WPF are more valuable, which underlines the importance of accounting for theoretically relevant contextual factors such as the gender of the manager. Otherwise, gender differences are easily overlooked (Table 4 Model 3), leading to incorrect conclusions [4].

Discussion and conclusion

Although WPF are a widespread phenomenon, findings on WPF of men and women, gender differences and their contextuality remain inconclusive (Morrison and Cooper-Thomas, 2017). Previous research on WPF mostly focused on single organizations, firms, or sectors. This is not only a disadvantage for generalizability but also makes an investigation of the role of workplace characteristics impossible. Our study addressed this gap by investigating the question: "Are there gender differences in workplace friendships, and do these differences

Table 3. Regression coefficients predicting number of female and male WPF (mixed-effects negative binomial regression; incidence-rate ratios, standard errors in parentheses)

	Female WPF				Male WPF		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Without controls	With controls	With department characteristics	Interaction share of women	Without controls	With controls	With department characteristics
Female	2.435***	2.499***	2.374***	6.838***	0.690**	0.704**	0.726**
	(0.259)	(0.267)	(0.252)	(1.801)	(0.075)	(0.077)	(0.080)
Share of women department			1.198**	1.388***			0.989
			(0.074)	(0.097)			(0.044)
Female manager			1.102	1.106			0.522**
			(0.249)	(0.244)			(0.099)
Female × share of women department				0.788***			
				(0.042)			
Controls included		x	x	x		x	x
Constant	0.054***	0.458	0.205	0.111*	0.120***	0.310	0.335
	(0.014)	(0.466)	(0.217)	(0.119)	(0.029)	(0.320)	(0.347)
Dispersion parameter	−1.502	−1.687	−1.725	−2.055	−0.211	−0.234	−0.233
Random effect variances							
Organization-level	3.608	2.763	2.892	2.902	3.275	2.285	2.307
	(0.912)	(0.707)	(0.727)	(0.728)	(0.807)	(0.587)	(0.584)
Department-level	0.633	0.542	0.427	0.401	0.232	0.214	0.117
	(0.188)	(0.167)	(0.142)	(0.133)	(0.097)	(0.092)	(0.074)
AIC	2910.55	2903.047	2893.017	2875.481	3022.66	3031.127	3019.119
Log-likelihood	−1450.275	−1421.523	−1414.508	−1404.741	−1506.335	−1485.563	−1477.559

Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
N(Organizations) = 98; N(Departments) = 260; N(Employees) = 2,606
Controls: years in the organization, years in the department, age, years of education, number of employees, sector, children, work from home, country
Source(s): Table by authors

Table 4. Regression coefficients predicting homophily in WPF (mixed-effects linear regression regression-coefficients, standard errors in parentheses)

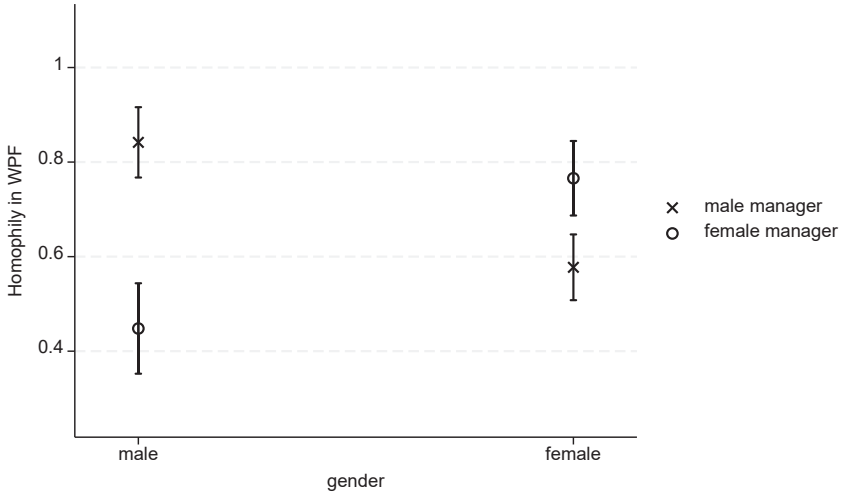
	(1) Without controls	(2) With controls	(3) Department characteristics	(4) Interaction female manager
Female	−0.025	−0.045	−0.043	−0.271***
	(0.045)	(0.046)	(0.047)	(0.051)
Share of women department			0.002	0.008
			(0.011)	(0.010)
Female manager			−0.061	−0.402***
			(0.044)	(0.062)
Female × female manager				0.583***
				(0.080)
Controls included		x	x	x
Constant	0.691***	0.581***	0.568***	0.750***
	(0.035)	(0.139)	(0.142)	(0.135)
Random effect variances				
Organization-level	0.011	0.008	0.007	0.005
	(0.007)	(0.005)	(0.005)	(0.004)
Department-level	0.060	0.058	0.053	0.029
	(0.016)	(0.015)	(0.016)	(0.011)
Employee-level	0.073	0.074	0.072	0.072
	(0.005)	(0.005)	(0.005)	(0.005)
Random-slope female	0.161	0.158	0.170	0.098
	(0.035)	(0.035)	(0.037)	(0.026)
Covariance	−0.086	−0.087	−0.087	−0.045
(Female − constant)	(0.021)	(0.021)	(0.022)	(0.015)
AIC	426.569	440.6589	443.2347	400.3215
Log-likelihood	−206.2848	−193.3295	−192.6174	−170.1608

Note(s): *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$
N(Organizations) = 68; N(Departments) = 150; N(Employees) = 726
Controls: years in the organization, years in the department, age, years of education, number of employees, sector, children, work from home, country
Source(s): Table by authors

vary with respect to characteristics of the workplace?", using the "European Sustainable Workforce Survey", mixed-effects negative binomial and mixed-effects linear regression models. This study has shown that men and women differ in their workplace friendship outcomes. This suggests that these differences do not solely reflect personal preferences, but are shaped by the specific context of the workplace.

Our first goal was to analyze potential differences in the number of WPF between men and women. In line with our expectations, we conclude that women have more WPF. It is often assumed that having more WPF is advantageous, but this might not always be the case. On the one hand, while WPF are beneficial, they also require maintenance and are thus associated with costs (Methot *et al.*, 2016). On the other hand, more WPF could be a strategy to ensure sufficient access to resources at work. While we have theorized about this, we did not directly investigate the implications of having different numbers of WFP. Future research should thus investigate, whether men and women derive similar benefits from their WPF.

Our data showed that both, men and women, have more same-than different-gender WPF (homophily preference). Supporting our expectations and prior research, women have more female and less male WPF than men, again underlining the tendencies for homophily (McPherson *et al.*, 2001). Comparing the homophily levels of men and women, we did not find



Source(s): Figure by authors

Figure 1. Predictive margins with 95% CIs of homophily in workplace friendships by employee and manager gender

any gender differences in homophily in WPF suggesting that both have a tendency for same-gender WPF. Our findings oppose prior studies, which found men to have more homophily in their social relationships at work (e.g. Ibarra, 1997; Stackman and Pinder, 1999). This discrepancy in results may be due to differences in the sample of organizations studied. As men are overrepresented in managerial positions, single-firm studies were more likely to analyze the homophily of men and women who had male managers. This overrepresentation of departments with male managers leads to the incorrect conclusion that men always have a higher preference for homophily at work. Moreover, earlier studies were conducted in the 90s and mainly focused on organizations in male-dominated industries (e.g. banking, pharma). Since then, more and more women entered the labor market, and the gendered power structure of organizations has changed. Our more recent sample provides a better picture of the job situation of employees nowadays and includes organizations from different (and sometimes more gender-equal) sectors such as health care. Overall, we conclude, that generally men and women have the same preference for homophily, but that the context of the workplace naturally limits the opportunities to realize these individual preferences. Furthermore, it is important to recognize that neglecting this context dependency can lead to overseeing existing gender differences in WPF. In the future, we expect gender differences in WPF to decrease, as more women continue to enter male-dominated occupations and sectors and managerial positions (Wellington *et al.*, 2003). Our findings on workplace characteristics further support the argument that organizational characteristics constrain personal friendship preferences.

Our second goal was to examine gender differences in WPF with respect to the characteristics of the workplace. We find support for the hypotheses that workplace characteristics "opportunity structure" (gender composition) and "distribution of power" (manager's gender) shape gender differences in WPF. Firstly, our results show that a higher share of women in the department is positively associated with the number of female friends and women tend to select other women as WPF. Contrary to our expectations, this tendency weakens as the share of women increases, suggesting that the absolute presence of same-gender individuals plays a crucial role. In workplaces where women are a minority, the tendency to form same-gender WPF might be especially strong, as support from this in-group might be particularly important in such environments. In contexts with higher shares of

women, the necessity for this specific support might be declining. Secondly, we hypothesized that an organization's distribution of power affects who is perceived as instrumentally valuable WPF and that female managers signal that women can hold power positions. We found that women with a female manager have higher levels of homophily. In contrast, women with a male manager have much lower levels of homophily, potentially because male WPF are more valuable as instrumental support in these cases (Ibarra, 1992). This suggests, that women's lower levels of homophily may not be a preference but a strategy to assure access to instrumental support. This interpretation aligns with the findings of Burt (1998), who argues that in situations where women are not legitimate group members, they rely on male strategic partners to overcome their disadvantaged position. In organizations where a large majority of management positions is occupied by men, women are likely to be perceived as illegitimate in terms of instrumental resources. Men have an advantage in such work contexts, as they can have legitimate and instrumental valuable relationships with other men and simultaneously realize their preference for homophily. Having a female manager could enhance the legitimacy and instrumental value of women, potentially changing the situation. Here, women might be more attractive as WPF, so that they do not need to rely on male WPF as strategic partners for instrumental resources. Large discrepancies in the extent of homophilous WPF between men and women potentially contribute to gender inequality because these relationships are particularly beneficial at work due to high levels of trust and reciprocity (Ibarra, 1993; Markiewicz *et al.*, 2000). Therefore, organizations seeking to improve gender equality should consider workplace characteristics influencing the opportunities for homophilous WPF. One promising avenue is to increase efforts to promote women's entry into management positions. Firstly, this ensures that enough women are in key positions where they have access to resources. Secondly, it supports a culture of equality and mitigates women's lower status at work so that they become more legitimate and attractive as WPF. Moreover, in organizations with strong dominance of male power, time and consideration should be devoted to the question of how to ensure that women have equal access to resources and opportunities to build friendships with other women. Support from the organization, programs, groups or workshops directly targeted at women could be promising interventions.

We also contribute to the body of literature investigating the link between the manager's gender and gender equality in the work domain. Here the central question is whether or not female managers have the potential to improve the situation of their female subordinates and thereby decrease gender inequality overall. Findings on this topic are mixed. Some evidence suggests that female managers can be "agents of change" (e.g. decrease wage gap; Zimmermann, 2022), others found female managers only have limited power or motivation to change the situation (van Hek and van der Lippe, 2019, 2022). In line with the change agent hypothesis, we find that having a female manager has relational consequences for the informal networks of employees.

The study has several limitations. Firstly, the data contains many individuals who have no WPF. Due to the survey design, it remains undifferentiable whether these individuals have zero WPF or have a missing on this question. However, since we were interested in how gender and workplace characteristics influence those who have WPF, those without WPF were not the focus of the analyses. Secondly, even though the ESWS is an unparalleled database, it is not representative of all organizations in participating countries. Because of the use of convenience sampling, selection of specific sectors and low numbers of organizations for some countries, findings should not be interpreted as universally valid. Moreover, given the need to balance efficiency and data quality in large-scale surveys, time-effective single-item measures were used. While this dataset allowed us to explore the understudied topic of the gender of WPF and the organizational context shaping WPF outcomes, it should be viewed as a preliminary investigation. Future research should employ validated measures to ensure robust findings.

Thirdly, the two items used in the operationalization of WPF capture the affective component more than the instrumental. We argue that by being co-workers there is automatically an instrumental relationship, but we do not have any information on the strength

or quality of the instrumental component. Future research could test this assumption, directly measuring the amount and nature of instrumental resources provided by WPF.

Lastly, due to the nature of the data, our analysis treats gender as binary and does not account for non-binary employees. While this study focuses solely on WPF and binary gender, our findings may extend to other dimensions of workforce diversity, such as race and sexual orientation. From a numerical representation standpoint, for employees belonging to these minority groups, it is harder to find similar WPF, particularly when identities intersect (e.g. Black lesbian women). At the same time, these employees may encounter unique workplace challenges, making homophilous WPF especially valuable for their support and well-being. A more diverse workforce increases opportunities for employees with diverse social identities to form homophilous relationships. Future research should explore the topic of workplace friendships, focusing on additional dimensions of diversity and their intersections. For example, researchers could investigate if and to what extent categories such as race and sexual orientation affect the number of WPF, the characteristics of these relationships and the benefits employees derive from them.

Nonetheless, the findings of this study contribute to the literature as they provide new insights into the subject of WPF especially on its contextuality. Recognizing that the gender of the employee, gender composition of the department and gender of the manager are factors that play a role in the question of who is friends with whom, is crucial to understanding the phenomenon of friendships at the workplace. Additionally, we show the importance of analyzing various WPF outcomes (number of WPF, number of female/male WPF, homophily) to detect gender differences. This shows, that gender differences can manifest in many forms beyond mere numbers and subtle differences can be overlooked easily. This may explain the partially inconclusive findings of prior studies (Schoen *et al.*, 2018). If organizations are more aware and intentional about these factors, efforts to increase gender equality at work may be more effective. Future research should aim to connect findings on the presence and patterns of men's and women's WPF to important job outcomes like performance or well-being at work. This could help to understand how WPF are connected to persisting gender inequality and provide a foundation for interventions.

Notes

1. Gender is treated binary in this paper, but we recognize that individuals have diverse gender identities.
2. Despite significant overdispersion, the negative dispersion parameter in the models indicate a poor fit. Therefore, we also ran multilevel mixed-effects Poisson models, which yielded results largely consistent with negative binomial models.
3. We also attempted to include random slopes in the negative binomial models, but this resulted in non-convergence.
4. We argue above that by combining the items "*Whom in your department do you also see outside work?*" and "*Whom do you like to work with in your department?*" we employ a gender-sensitive measure of WPF. Additionally, we conducted all analyses using only the "see outside work" item as a dependent variable. This stricter measure yields similar results. However, an exception is observed in the number of coworkers someone sees outside of work. In comparison to the original measure of WPF, gender differences decreased and only reached marginal significance ($IRR = 1.219, p = 0.051$) in the full model including department-level characteristics and controls. Additionally, we also observe women have lower chances of meeting male coworkers outside of work. Together, these findings support our argument that cross-gender WPF are less likely to extend beyond the workplace. However, our theoretical arguments suggest, that even if not extended to the private sphere, WPF offer unique resources and supports the appropriateness of our chosen measurement.

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