

Empirical insights into leadership in corporations

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Empirical insights into leadership in corporations

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List of articles

This dissertation comprises the following articles. The four articles are sorted in accordance with their order of appearance in this dissertation. The journal rankings correspond to the VHB-JOURQUAL3, published by the German Academic Association for Business Research (VHB).

Article 1:

Funk, Stephanie and Warning, Susanne (2024): The leadership gap between full-time and part-time female employees.

Working paper.

This manuscript is under review at the *European Management Journal* (VHB-JOURQUAL3: B); status: revise and resubmit (revision submitted).

Article 2:

Funk, Stephanie (2024): Does being a leader make them stay? Short- and long-term effects of supervisory responsibility on turnover intentions.

Working paper.

This manuscript is under review at the *Human Resource Management Journal* (VHB-JOURQUAL3: B); status: revise and resubmit (third round, revision submitted).

Article 3:

Funk, Stephanie (2023): Sick of leading? Supervisory responsibility and its consequences for sickness absenteeism and sickness presenteeism.

Working paper.

This manuscript is under review at the *Journal of Business and Psychology* (VHB-JOURQUAL3: B); status: revise and resubmit.

Article 4:

Funk, Stephanie (2023): On an ego trip: The relationship between supervisory responsibility and leader altruism.

Working Paper.

This manuscript is under review at the *International Journal of Manpower*; status: revise and resubmit.

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List of abbreviations

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ACME	Average causal mediation effect
ADE	Average direct effect
BA	German Federal Employment Agency
FDZ	Research Data Centre
HRM	Human resource management
IAB	Institute for Employment Research
IRR	Incidence rate ratio
JD-R	Job demands-resources
LPP	Linked Personnel Panel
LPP-ADIAB	Linked Personnel Panel linked to the administrative individual-level data from the Integrated Employment Biographies
Max	Maximum
Min	Minimum
N	Number of observations
OLS	Ordinary Least Squares
SD	Standard deviation
TE	Total effect
VHB	German Academic Association for Business Research

1 Introduction

1.1 Motivation

“I am not afraid of an army of lions led by a sheep. I am afraid of an army of sheep led by a lion.” – Alexander the Great (as cited in Steffens et al., 2018, p. 23)

As this quote suggests, it is not the army, i.e., the individuals that matter for success, but rather, it is the leadership that makes the difference (Bass and Bass, 2008; Bennis, 2007). Similarly, in the corporate world, leadership is often considered the single most critical factor for the success or failure of organizations (Bass and Bass, 2008). But why is there even such a thing as a “need for leadership” (Bass and Bass, 2008, p. 33)? First, at the organizational level, corporate leaders are critical for the success, the vitality, and therefore the overall performance of their organizations (Zaccaro, 2001). Notably, effective leadership is necessary for the coordination and the functioning of an organization (Day and Antonakis, 2012). Second, at the employee level, leaders have the capacity to influence the performance of a team, a work unit, or the whole organization (Yukl, 2012). Also, leaders make a difference in subordinates’ satisfaction, their performance, their intention to stay, and their prosocial behavior (Bass and Bass, 2008). Last, at the societal level, leadership is vital for coordination and decision-making processes and, therefore, for effective societal functioning (Day and Antonakis, 2012). As described, leadership matters not just for corporations, but it also influences the quality and health of peoples’ lives (Bennis, 2007). Briefly, “leadership plays a critical, if not the most critical, role, and is therefore an important subject for study and research” (Bass and Bass, 2008, p. 52).

But what is leadership, after all? Since the beginning of scientific leadership research in the twentieth century, different definitions have evolved in countless essays and discussions. The inherent ambiguity surrounding the meaning of this concept emanates from a vast number of terms that are used to describe leadership or related phenomena. Terms such as power, authority, management, administration, control, and supervision are among the terms that, although not synonymous, undeniably overlap, with the extent of this overlap serving as a subject of ongoing debate and allowing room for diverse interpretations (Yukl and Gardner, 2020). Scholars have previously defined leadership in terms of traits, behaviors, influence, interaction patterns, role relationships, and the occupation of an administrative position (Yukl and Gardner, 2020). Notwithstanding the diversity of definitions, they commonly share the

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foundational premise that leadership entails a process of influence aimed at enhancing the performance of a collective task (Yukl and Gardner, 2020). Some scholars have differentiated between leadership and management, seeing leadership as the visionary, inspiring, forward-looking element, while management, on the contrary, represents the preservative and administrative dimension (Kaehler, 2020; Yukl and Gardner, 2020). These two constructs may be perceived as complementary or mutually exclusive but most scholars today view leadership as a component of management (Kaehler, 2020; Yukl and Gardner, 2020). After all, Day and Antonakis (2012) concluded that due to its complex nature, it is difficult to define leadership precisely or to find a specific and universally accepted definition of leadership. Considering these complexities, it becomes evident that there is no such thing as a singular definition of leadership but as Silva (2016) contended, defining leadership is contingent upon the researcher's interest and the specific problem under examination.

In the context of this dissertation, I define leadership in a way that takes into account an individual's administrative position. I construe leadership in the sense of personnel management, viewing leadership as the exertion of influence over individuals within organizations and their units, intending to attain the unit's objectives by eliciting optimal work performance and meeting other requisites (Kaehler, 2020). According to this definition, organizational leaders are endowed with responsibility and authority (in the form of legitimate power, right, or permission) to carry out assignments for which they are held accountable, following their organization's norms and rules (Bass and Bass, 2008). Using an individual's administrative position as the basis for defining leadership offers the advantage of objectivity. Utilizing an objective measure is generally more conducive to scientific analyses when compared to a subjective measure because it facilitates comparison across various establishments, individuals, or over time. Consequently, within this dissertation, I define leadership as having supervisory responsibility over other employees, reflecting one dimension of the broader concept of leadership. Hereafter, I use the terms 'leader' and 'supervisor' interchangeably to refer to individuals occupying positions involving the supervision of other employees.

When taking a closer look at some descriptive statistics on leadership in Germany, it becomes evident that in the year 2023, approximately 4% of individuals with employment contracts held leadership positions with supervisory responsibility (Eurostat, 2023a). Notably, in Germany, about 71% of these leaders were male, while only 29% were female. These statistics provide initial insights into the gendered nature of leadership, a trend that extends beyond Germany (e.g., Bark et al., 2016; Schuh et al., 2014). Not only women but also part-

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time employees are, with approximately 8% in Germany, underrepresented in leadership positions (Eurostat, 2023a). This underrepresentation of part-time employees in leadership positions is a topic that constitutes an integral part of the ongoing discourse within the field of leadership research (e.g., Deschacht, 2017) which I will also address in chapter 2 of this dissertation.

In times of demographic change and the face of a digital and ecological structural transformation, Germany is struggling with a significant shortage of skilled workers, a situation that has reached its peak according to the IFO Institute (Peichl et al., 2022). This challenge affects nearly all European countries, with Germany experiencing it particularly strongly if not most intensely (Peichl et al., 2022), making Germany an interesting case to examine. The scarcity of skilled workers is accompanied by a deficiency of managers and leaders. As the pool of qualified workers continues to shrink in times of such a managerial shortage, it becomes increasingly difficult to recruit and retain leaders. Competing in this ‘war for talent’ becomes a significant challenge for employers, as noted by Barnett and Hall (2001), which in turn drives a desperate search for leaders. In response to this predicament, employers can consider, among others, two key strategies.

First, they can recruit additional talents by harnessing the potential of part-time employees and incorporating them into the talent pool for leadership positions. Therefore, employers would address solutions concerning the work-life balance of employees (Barnett and Hall, 2001). In line with this, article I of this dissertation takes up the idea of this first strategy and focuses on the evolving trend of reducing working hours to improve individuals’ work-life balance and leadership. It delves into the subject of whether employers can address this issue by considering part-time employees for leadership roles, revealing that there is a gap in the occupancy of leadership positions between full-time and part-time female employees, which varies based on the contractual working hours of part-time employees. The research explores how different corporate cultures can help bridge this gap between full-time and part-time female employees in occupying a leadership position with supervisory responsibility.

A second strategy that employers can consider is to enhance their efforts to retain qualified employees, especially leaders. Correspondingly, article II takes a different approach and aligns with this second strategy. It addresses the managerial shortage by retaining qualified employees. This article investigates the promotion of individuals into leadership positions with supervisory responsibility as a method to retain these employees and preserve their skills within the organization. The study offers new insights that this approach can serve as a short-term

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retention strategy and delves into human resource management practices (HRM) that can contribute to reduce turnover intentions among leaders in the long run.

Furthermore, when it comes to recruiting and retaining leaders for extended periods, it becomes crucial to explore the enduring consequences of supervisory responsibility. Therefore, articles III and IV of this dissertation focus on investigating the lasting consequences of supervisory responsibility impacting individuals, organizations, and society as a whole. Article III specifically delves into whether occupying a leadership position with supervisory responsibility is beneficial for the leaders themselves, more specifically, if the demands of these positions influence labor-market related health behaviors, such as sickness absenteeism and sickness presenteeism. Both behaviors are relevant not only for the health of the leaders and future leaders but, given their substantial costs, also for employers (Grinza and Rycx, 2020; Yang et al., 2023) and society (Bryngelson, 2009; Hassard et al., 2018). To gain deeper insights into the long-term effects of leadership positions on organizations and society, article IV explores how occupying such positions may alter a leader's altruistic behavior over time. This is relevant for employers because altruistic leaders are shown to benefit organizations in multiple dimensions (e.g., Barghouti et al., 2023; Guinot et al., 2016; Salas-Vallina and Alegre, 2018).

Despite the extensive body of research on leadership, many questions in this field remain unanswered (Yukl and Gardner, 2020). One area that remains underexplored is the topic of leadership positions with supervisory responsibility. Previous research in this domain is limited, primarily focusing on aspects like gender (e.g., Bark et al., 2016; Deschacht, 2017; W.-D. Li et al., 2011; Schuh et al., 2014; Yaish and Stier, 2009) and personality differences (e.g., Doornenbal et al., 2022; Fietze et al., 2011; W.-D. Li et al., 2011) within supervisory positions when examining the factors that determine the attainment of such positions. In a first step, this dissertation aims to enhance the ongoing academic discourse on the antecedents of supervisory responsibility by investigating a more malleable influencing factor that individuals themselves can modify, namely their contractual working hours.

Furthermore, in a second step, this dissertation goes beyond exploring the determinants of supervisory responsibility and contributes to the literature on the outcomes associated with holding such positions: Numerous leadership theories have been proposed (Dinh et al., 2014), and there is a vast amount of research on leadership (and leadership styles) and its impact on the effectiveness of leaders themselves (e.g., Paustian-Underdahl et al., 2014), team and organizational outcomes (e.g., Hughes et al., 2018), as well as subordinates' satisfaction and

commitment (e.g., Yahaya and Ebrahim, 2016). In this context, this dissertation relates to existing research on leadership and turnover intentions (e.g., Baranchenko et al., 2020; Manchester, 2012), leadership and health (e.g., Fletcher and French, 2021; Inceoglu et al., 2021; Wegge et al., 2014), and anti-social leader behavior (e.g., Bendahan et al., 2015; Rus et al., 2010). By doing so, it offers a more comprehensive understanding of the consequences of occupying leadership positions with supervisory responsibility for employees themselves, their employers, and society as a whole.

1.2 Structure of the dissertation and overview of the articles included

This dissertation is organized as follows: First, I give a summary of the four articles included in this dissertation. Following this, article I investigates the relationship between contractual working hours and the likelihood of females occupying leadership positions with supervisory responsibility in chapter 2. Specifically, it delves into the part-time leadership gap and its variations based on corporate cultures. Next, in chapter 3, article II examines the consequences of promoting employees into leadership positions on their intentions to leave their employer. In chapter 4, I present article III, which explores how leadership positions influence the two labor-market related health behaviors, sickness absenteeism and sickness presenteeism. In the following chapter (chapter 5), article IV contemplates the correlation between supervisory responsibility and leader altruistic behavior. Finally, the dissertation concludes with a summary of the findings, practical implications, limitations, and potential directions for future research in chapter 6.

Article I: The leadership gap between full-time and part-time female employees

The first article examines the impact of employees' contractual working hours on occupying leadership positions with supervisory responsibility for females. Within this article, we argue that employees' contractual working hours act as a signal of their work engagement to employers, which may qualify employees for leadership positions. Therefore, female full-time employees are more likely to occupy a leadership position with supervisory responsibility. The gap in this likelihood of holding such a leadership position between full-time and part-time employees narrows as part-time employees increase their contractual working hours. The article further asserts that this leadership gap depends on corporate cultures influencing employee visibility and availability. Using German linked employer-employee data, our empirical analyses validate these predictions, suggesting that lower contractual working hours reduce the probability of women holding leadership positions, while a higher number of contractual working hours mitigates this gap. The size of the leadership gap varies with

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corporate cultures, being smaller in firms with a low proportion of employees working overtime or a high proportion of employees working from home. This research contributes to the literature by highlighting that the impact of part-time work on leadership positions is contingent on the contractual working hours of part-timers. It advances the discussion of sustainable human resource management strategies for part-time employees' career development, specifically in part-time leadership positions. Additionally, it provides valuable perspectives on the heterogeneity of part-time workers and the design of corporate cultures for creating work environments that promote part-time leadership.

Article II: Does being a leader make them stay? Short- and long-term effects of supervisory responsibility on turnover intentions

The second article investigates how promoting employees into leadership positions with supervisory responsibility impacts their turnover intentions. This study integrates perspectives from social exchange and human capital theory to differentiate the short- and long-term effects of supervisory responsibility on turnover intentions. In the short run, social exchange theory posits that obtaining supervisory responsibility reduces employees' turnover intentions due to reciprocal feelings. In contrast, in the long run, human capital theory suggests that supervisory responsibility can increase employees' turnover intentions as individuals accumulate general skills, making them more attractive to external job opportunities. The study further posits that HRM practices enhancing internal career development counteract the long-term turnover-increasing effect. Empirical tests using German linked employer-employee data support these predictions, highlighting both short-term turnover-reducing and long-term turnover-increasing effects of supervisory responsibility. The findings also underscore the mitigating impact of HRM practices such as appraisal interviews and development plans on long-term supervisors' intentions to quit. This research contributes to the literature by integrating the time-scaling into the relationship between supervisory responsibility and turnover intentions and by identifying two HRM practices as potential tools for employers to mitigate turnover intentions among long-term supervisors, providing suggestive evidence to organizations concerning leader retention.

Article III: Sick of leading? Supervisory responsibility and its consequences for sickness absenteeism and sickness presenteeism

In the third paper, the focus shifts to the impact of leadership positions with supervisory responsibility and health. In particular, I consider sickness absenteeism and sickness presenteeism, two crucial health behaviors with economic and health implications for employees, employers, and society. Building on the job demands-resources (JD-R) model, the

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study suggests that supervisory responsibility acts as both a job resource and a job demand. I argue that both job characteristics increase work engagement among leaders. This heightened work engagement subsequently leads to a reduction in sickness absenteeism and an increase in sickness presenteeism. The study identifies two key mechanisms driving these changes: Permanent availability and time pressure. An analysis of German linked employer-employee data confirms that supervisory responsibility indeed reduces sickness absenteeism while elevating sickness presenteeism. Notably, these relationships are partially mediated by leaders' need for permanent availability and time pressure that comes with this position. This article contributes to the existing literature in two key dimensions. First, it enhances previous research by focusing on leaders' own health rather than solely on the impact of leadership on followers' health (e.g., Franke et al., 2014; Rugulies et al., 2021; Schaufeli, 2015). It also distinguishes itself by examining sickness absenteeism and sickness presenteeism within the context of leadership positions with supervisory responsibility. The study thereby sheds light on the interplay between sickness absenteeism, sickness presenteeism, and overall health. Second, this article empirically quantifies the role of permanent availability and time pressure in explaining sickness absenteeism and sickness presenteeism in leadership positions with supervisory responsibility. These findings help organizations seeking to understand and mitigate the health-related consequences of leadership positions, ultimately benefiting employee well-being and productivity.

Article IV: On an ego trip: The relationship between supervisory responsibility and leader altruism

The fourth paper explores the connection between power, particularly in the form of supervisory responsibility, and leader altruism. It delves into the roles of both the duration and the scope of supervisory responsibility to reflect structural power within organizational hierarchies. Drawing upon the approach-inhibition theory of power, this research suggests that individuals with greater structural power, meaning longer tenure in leadership positions with supervisory responsibility and more subordinates, tend to exhibit behavior characterized by decreased attentiveness, reduced empathy, and increased self-focus. Ultimately, this may result in a decline in altruistic behavior. Using German linked employer-employee data, this article shows that a prolonged duration and a greater scope of supervisory responsibility reduce leaders' altruistic behavior. Briefly, this article distinguishes itself from previous literature by examining structural power in real organizational settings, moving beyond the psychological experience of power often explored in controlled laboratory settings (e.g., Bendahan et al.,

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2015; Giurge et al., 2021). Additionally, it addresses the temporal dimension of the relationship between structural power and leader behavior because employers normally do not revoke their decision on granting such supervisory responsibility, and individuals, therefore, occupy such positions for multiple years. By focusing on supervisory responsibility over time, this research enhances the external validity of conclusions drawn from experimental studies (e.g., Bendahan et al., 2015; Giurge et al., 2021) and provides valuable insights for organizations to optimize leader selection and governance mechanisms.

The leadership gap between full-time and part-time female employees

Joint work by Stephanie Funk and Susanne Warning¹

Earlier versions of this manuscript have been presented at

- the Annual Meeting of the European Academy of Management (EURAM) 2022 in Winterthur, Switzerland,
- the Gender, Work, and Organizations (GWO) Conference 2022 in Bogotá, Colombia (virtual presentation),
- and the PhD Discussion Workshop on Personnel Economics and Economics of Education 2022 in Laax, Switzerland.

Additionally, an earlier version of this manuscript received the Best Paper Award of the Leadership Track and was nominated for the overall Best Paper Award at the Annual Meeting of the EURAM 2022 in Winterthur, Switzerland.

This manuscript is under review at the *European Management Journal* (VHB-JOURQUAL3: B); status: revise and resubmit (revision submitted).

Abstract: Employers interpret high numbers of contractual working hours of part-time employees as a signal for high work engagement qualifying them for a leadership position. However, signals do not work equally well in all environments. We suggest that the value of a signal depends on corporate culture, being relatively low in companies with strict work regimes where employees are expected to be available and visible. We test this prediction combining data on female employees and their employers. Our analyses show that the positive effect of contractual hours on leadership positions varies systematically with the difference between the contractual working hours of full-time and part-time employees. The smaller the working time difference between a full-time and a part-time employee, the more likely it is that the part-timer is in a leadership position. In addition, the more a firm relies on overtime and requires strict

¹ Both authors contributed equally to this work. The data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access.

presence at work, the larger is the statistical association between high contractual hours and leadership positions at individual level. In a world where work-life balance is increasingly important, this research provides new insights into the heterogeneity of part-time workers and the design of corporate cultures and policies to create sustainable work environments.

Keywords: part-time, leadership, supervisory responsibility, work environment, overtime culture, work-from-home policies

2 The leadership gap between full-time and part-time female employees

2.1 Introduction

The face of part-time work is that of a woman – at least in Germany, and still in the 21st century. Around 80 percent of the part-time workers in Germany are women (Eurostat, 2023a) – and this figure has remained unchanged for the last 10 years, despite the emphasis on gender equality in society. Since part-time workers are less likely to hold leadership positions, part-time work contributes to lower numbers of females in leadership.

This study explores the difference in the probabilities of holding a leadership position between full-time and part-time female employees – what we call the leadership gap. Since a key characteristic of part-time workers is that they are not always on-site, we examine how the perceived availability and visibility of employees, such as a firm's overtime culture and its work-from-home policies, affect the size of this gap. Two questions arise: On the one hand, part-time employees who aspire to leadership positions need to figure out how many working hours are optimal. On the other hand, employees and employers need to find out which work environments can support part-time leadership. A proposed theoretical framework accommodates the heterogeneous nature of part-time employment and the interpretation of working time arrangements in terms of availability and visibility in the work environment.

Employees do not only face a binary choice between part-time and full-time work, but also decide on the number of working hours in their employment contract. Employers observe this choice and can interpret contractual working hours as a signal of work engagement (Beham et al., 2020; McDonald et al., 2009), which is often an essential but unobservable prerequisite for a leadership position (Day, 2000). Employees with a higher number of contractual working hours signal a higher work engagement to their employer, which increases their probability of holding a leadership position. The leadership gap between full-time and part-time employees narrows as the number of contractual working hours of part-timers increases. Consequently, the leadership gap is a function of the working time differences between full-timers and part-timers.

The leadership gap between full-time and part-time employees is neither constant nor stochastic. Instead, we suggest that it depends on the work environment. A company's overtime culture and work-from-home policies influence the strength of the negative signal part-time workers send to their employers. If working beyond contractual working hours is common in a firm, the overtime culture is strong. If most employees always work on-site at a company's premises, the work-from-home policies are restricted. In firms with a strong overtime culture or restricted work-from-home policies, employers are used to employees being visible and

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available, so part-timers are perceived as less engaged in these work environments. Then, part-timers are disadvantaged in their careers when employers base decisions about leadership positions on working hours.

We empirically test these predictions based on German employment data, combining available information on female employees and firms. Since part-time work remains predominantly a feminine phenomenon, the empirical analysis focuses on female employees. We find that lower contractual working hours reduce the probability of women holding leadership positions with supervisory responsibility. The leadership gap is strictly positive; it is a function of the working time differences between female full- and part-timers, and it decreases when female part-timers choose a higher number of contractual working hours. The size of the gap, however, depends on corporate cultures influencing the importance of employee visibility and availability. The leadership gap is comparably small when the proportion of employees working overtime in a firm is low, or when the proportion of average hours worked from home to the average total working time in a firm is high. In short, the leadership gap is minimal when female part-timers choose a high number of contractual working hours and when employers do not expect employees to be available on-site.

Understanding the leadership gap between full-time and part-time workers is critical in times of skill shortages. Optimizing the potential of part-time workers can help organizations fill critical leadership roles. As the face of part-time employment is predominantly female, understanding and addressing the female leadership gap can also help reduce the gender gap in leadership. This is essential if all available talent pools are to be tapped.

Our research makes contributions to three strands of literature. First, we show that the negative effect of part-time work on leadership is a function, not a constant. While previous empirical studies are consistent in controlling for part-time work when explaining leadership (Fietze et al., 2011; Huffman and Cohen, 2004; Rosenfeld et al., 1998), different categories of part-time work have been recently introduced to explain gender differences in the promotion to a managerial position (Deschacht, 2017) and perceived promotability (Beham et al., 2020). Both identify low working hours of part-timers to be particularly harmful. In contrast to Deschacht (2017) and Beham et al. (2020), our study explicitly focuses on leadership positions rather than on promotions. Furthermore, instead of simply making a binary distinction between part-time and full-time employment, we generalize part-time arrangements and consider working hours on a continuous scale. This allows us to precisely quantify the leadership gap between full-time and part-time employees. Our operationalization has both advantages and disadvantages: An advantage is that we do not rule out a company's recruitment strategy, which

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may (or may not) link leadership positions to full-time contractual obligations. The disadvantage is that we cannot identify employees who have reduced their working hours after being promoted to a leadership position explicitly.

Second, we contribute to the discussion on sustainable and inclusive human resource management strategies in a company (Beham et al., 2020; Karlshaus, 2020) that support the career development of part-time employees, using the example of part-time leadership by identifying work environments that foster part-time leadership. While some rare qualitative studies emphasize workplace presence (Adams, 1995; Bleijenbergh et al., 2016; M. D. Lee et al., 2002; Sheridan, 2004) and employee visibility (McDonald et al., 2008) to hinder part-timers' career advancement, Tomlinson et al. (2018, p. 19) call for an investigation of the "conditions [...] to further enhance our understanding of flexible careers". We unlock the black box of part-time workers in leadership and develop a theoretical argument relying on signaling theory (Spence, 1973) from economics and findings on the perception of a signal from management (e.g., Connelly et al., 2011) to explain how a firm's emphasis on employee availability and visibility affects the leadership gap between full-time and part-time employees. From an empirical perspective, we demonstrate that the leadership gap function depends on a firm's overtime culture and its work-from-home policies.

Finally, we indirectly contribute to the discussion on the underrepresentation of women in leadership positions (Bark et al., 2016). We suggest that one reason for this is that women favor shorter working hours. In firms with flexible working arrangements, i.e., a weak overtime culture and widespread work-from-home policies, there should be comparatively more women in leadership positions. This situation triggers a matching strategy: Ambitious women who aspire to leadership positions but prefer part-time work should seek employment in companies with liberal working conditions.

2.2 Literature and hypotheses

2.2.1 Part-time work and leadership positions

A little more than eight percent of employees in leadership positions in Germany work part-time (Eurostat, 2023a). And evidence suggests that more and more employees would like to work part-time (H. Chung and van der Lippe, 2020; Fuchs-Schündeln, 2019) and participate in working time models that can be adapted to different life stages. But the costs of part-time work, including the detrimental impact of part-time work on career opportunities, prevent many would-be part-timers from reducing their working hours.

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Three arguments seek to explain why part-timers are less likely to hold leadership positions. First, part-timers have less time to acquire human capital and are less productive (Fietze et al., 2011; Huffman and Cohen, 2004). Second, part-timers are not a random draw of employees, but they may have different preferences for effort at work and intentionally choose jobs without supervisory responsibility (Cabane and Clark, 2015). A third argument, on which we draw in the rest of this paper, draws on the empirical observation that firms are less likely to promote part-timers to leadership positions than full-time employees (Deschacht, 2017; Fietze et al., 2011; Rosenfeld et al., 1998) because they perceive employees with low working hours as “less engaged” (Lane, 2000; McDonald et al., 2009; Tomlinson, 2006), “less motivated” (Anger, 2008; Bossler and Grunau, 2020), “less committed” (Beham et al., 2020; Javdani and McGee, 2019), and “less dedicated” to work and career (Bossler and Grunau, 2020; Pfeifer, 2010). If these perceptions hold, asymmetric information between employers and employees with respect to work engagement of employees may prevent leadership in part-time. Then, employees use high working hours as a signal to their employers, in the sense of Spence (1973), to show that they are engaged and potentially seek a leadership position.

From an employer’s perspective, leadership positions require high levels of effort, motivation, and commitment (Day, 2000), achievement motivation (Mumford, Zaccaro, et al., 2000), and emotional stability (Judge et al., 2009), all of which shape an employee’s work engagement. Of course, employers invest in techniques measuring these properties, but they often cannot observe all required characteristics of potential leaders. This clearly holds for external candidates applying for a leadership position, but, to some extent, also for internal candidates. To the extent that important leadership characteristics remain unobservable, employers may interpret an employee’s contractual working hours as an indicator of leadership qualities and assign her to a leadership position – or not.

If employers interpret an employee’s number of contractual hours as a signal of work engagement, part-timers with more contractual hours are more likely to be in leadership positions with supervisory responsibility. This positive relationship implies that part-time work is not harmful per se. The positive slope of the probability of obtaining a leadership position gradually reduces the leadership gap, i.e. the difference in the probability of obtaining a leadership position between full-timers and part-timers.

Hypothesis 1: The higher the number of contractual working hours of employees, the smaller the leadership gap between full-time and part-time employees.

2.2.2 Work environment and the leadership gap between full-time and part-time employees

The number of working hours is a signal that carries information about work engagement – but the value of the signal varies with the work environment in which the signal is sent. Any given signal has a greater value in a quiet environment than in a noisy one. But what are the environmental characteristics of a firm that influence the degree to which a given signal is observed? We argue that the work environment, in particular an organization’s overtime culture and its work-from-home policies, influences employers’ interpretation of the number of contractual working hours of part-time employees when allocating leadership positions. Consequently, part-time work is not equally detrimental to leadership in all firms; on the contrary, some work environments support part-time leadership while others do not.

When employers cannot observe employee characteristics directly, they take signals, such as working hours and interpret them instead. The same signal, however, can be interpreted differently (Nishii and Wright, 2008; Rynes et al., 1991) because perception depends on the receiver’s experience and the signaling environment (Connelly et al., 2011). Consequently, the work environment influences the interpretation of the signal part-time workers send.

We concentrate on two features of the work environment covering visibility and availability of employees in the workplace: A firm’s overtime culture and a firm’s work-from-home policies. Following Fried (1998, p. 37) we define an overtime culture as “the natural expectation that employees will put in overtime”. In a strong firm overtime culture, employees are expected to work more than the number of hours in their contracts; in a weak overtime culture, employees are expected to work only the number of hours in their contract, but no more. Work-from-home policies range from being restricted to widespread. In restricted work-from-home policies, all employees always work on-site at the firm; in widespread work-from-home policies, employers do not expect employees to be present at the workplace on-site, but support working from home. Both work environments are associated with the visibility and availability of employees at work.

Evidence that these cultural aspects matter is abundant. In June 2022, Elon Musk sent emails to SpaceX and Tesla employees, asking them to come back to the office for at least 40 hours per week after several months of working from home due to the Covid pandemic (NPR, 2022). Apparently, Musk perceives 40 hours as ‘normal working time’ and seems to believe that present workers are more engaged in their work and have higher output. Elon Musk is not alone in this perception. Interview studies reveal that being present and visible at the workplace is crucial for career advancement in general. A firm’s emphasis on excessive working hours harms

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the career advancement of those employees, both part-time and full-time, who do not work long hours (Nemoto, 2013); firm cultures that emphasize face time (Adams, 1995; M. D. Lee et al., 2002), visibility (Bleijenbergh et al., 2016), and presenteeism (Sheridan, 2004) hinder the career advancement of part-time employees.

The extent to which employees conform with corporate cultures and policies matters. The contractual working time is only a signal if it carries information on relevant characteristics of the employee to the firm. This is the case when the employer and the work environment emphasize visibility and availability. Otherwise, working time does not carry any relevant information for the employer and does not serve as a signal. If working time does not signal information on leadership skills in a specific context, then employers do not take it as an indicator when staffing leadership positions. A higher number of contractual working hours is a signal of high work engagement, which in turn increases an employee's chances of obtaining a leadership position with supervisory responsibility in certain work environments only: The stronger the overtime culture or the more restrictive the work-from-home policies, the wider the leadership gap between full-timers and part-timers.

Hypothesis 2: In a strong overtime culture, additional contractual working hours of part-timers reduce the leadership gap between full-timers and part-timers.

Hypothesis 3: In restricted work-from-home policies, additional contractual working hours of part-timers reduce the leadership gap between full-timers and part-timers.

2.3 Methods

Below is a brief description of the data and our sample, followed by an overview of the variables, some descriptive statistics, and an explanation of the statistical method.

2.3.1 Sample

The empirical test of the predictions relies on German employment data for two reasons. First, all employees in Germany have the legal right to work part-time. Second, in 2022, about 8 percent of employees in leadership positions in German firms worked part-time, which is representative of the European Union (Eurostat, 2023a). Thus, testing the predictions with data from Germany allows us to derive evidence from a Western country in which employees are increasingly interested in working reduced hours.

To analyze the relationship between employees' contractual working hours and the holding of leadership positions in different work environments, detailed information is needed on both employees and their employers. We combine data from two different sources on German employees and employers which are provided by the German Institute for Employment

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Research (IAB), a publicly funded research institute that, among others, provides representative survey data on German establishments.

First, we use the Linked Personnel Panel (LPP) (Ruf, Mackeben, Grunau, and Wolter, 2020; Ruf, Mackeben, Haepf, et al., 2020) which is representative of German private-sector establishments with more than 50 employees who are subject to social security, encompassing all private-sector industries except agriculture, forestry, and fishing. We use four waves of the LPP dataset which were conducted in 2012/2013, 2014/2015, 2016/2017, and 2018/2019. Both employees and their employers were surveyed, resulting in a linked employer-employee dataset. It provides detailed information on employee socio-demographics, working conditions, and career development at the individual level as well as information on human resource management practices, working arrangements, values, and structural conditions at the establishment level. The second data source is the IAB Establishment Panel (Bellmann et al., 2021; Ellguth et al., 2014), a survey that provides further information on establishments (e.g., establishment's proportion of female employees, firm size, industry indicator). The final dataset is a combination of the LPP data and the IAB Establishment Panel data. We rely on employees aged 18 to 67, which is the mandatory retirement age in Germany. This sample is used to calculate the firm environment variables.

For the empirical analyses, we focus exclusively on female employees. First, given that almost 80 percent of part-time workers in Germany are women (Eurostat, 2023a), part-time work remains predominantly a female phenomenon. Second, male and female employees may have different priorities regarding work and family, leading them to make different choices regarding their contractual working hours (Brett and Stroh, 2003; Rutherford, 2001). Thus, analyzing only female employees reduces a source of unobserved heterogeneity in the empirical models. And third, the low number of women in leadership positions is a key issue in both academic and societal debate.

Furthermore, the sample includes only individuals with a maximum contractual working time of 48 hours per week in conformity with the German Hours of Work Act (Hours of Work Act, 1994), and individuals with a total working time (including overtime hours) of less than or equal to 80 hours, since extremely long working hours are more likely to be a consequence than a determinant of supervisory responsibility (Wright et al., 1995). We exclude individuals with no formal qualifications and those with a level of education that cannot be attributed to a German degree². Since the signaling effect of contractual working hours can only be observed

² These two groups comprise 15 individuals; including them in the analysis does not qualitatively change the results.

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within the same firm, we focus on employees who continue to work for the same employer for at least two waves. This results in a sample of 769 women working for 343 employers.

To address potential endogeneity concerns, we lag our main independent variable, contractual working hours, by one period, so that we lose individual-level observations from the first wave of an individual. Of the 769 women in the final sample, 587 have been in the sample for two waves, 157 for three waves, and 25 for four waves. Therefore, after the lag, we end up with 976 ($= 1 \cdot 587 + 2 \cdot 157 + 3 \cdot 25$) employee observations for the main empirical analyses.

2.3.2 Measures

To measure the effect of obtaining a leadership position with supervisory responsibility, we operationalize our dependent variable *leadership with supervisory responsibility_t* using the question “Do you supervise others?”. The variable takes the value of 1 if the employee supervises other employees in year *t* and 0 otherwise.

We use *contractual working hours_{t-1}* at individual level as explanatory variable which is the number of weekly working hours noted in the employment contract. To measure the culture of visibility and availability in a firm, we are developing an overtime culture score and work-from-home policies score for each establishment. In line with the literature on long-hour work cultures (Zbyszewska, 2012), we construct the explanatory variable firm *overtime culture* as the proportion of employees in a firm who work overtime hours each week – averaged over all periods. This proportion measures the prevalence of overtime work among employees, irrespective of the number of overtime hours worked, to ensure that the *overtime culture* at establishment level and *contractual working hours_{t-1}* at individual level are distinct constructs.³ To measure *work-from-home policies* we use the proportion of the average hours worked from home to the average total working time of a firm – also averaged over all periods. Both measures are time-invariant because it is safe to assume that culture persists over time.

Table 1 summarizes the descriptive statistics and the correlations of the main variables. In our sample, around 18.5% of the employees over all years are in a leadership position with supervisory responsibility. Due to our study design, this number is notably above the overall European average (Eurostat, 2023a) for two reasons: First, we only include employees who in fact can obtain a leadership position with supervisory responsibility in their job; Second all employees in our sample have been working for the same employer for at least two periods. Both restrictions increase the probability of a leadership position but at the same time reduce

³ The bivariate correlation is small and negative.

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self-selection issues of employees into certain jobs and thus provide conservative estimates for the leadership gap.

The average contractual working time of all female employees over all years (no matter whether they are in a leadership position or not) is 33 hours. Over all firms in the sample, on average 62.9% of their male and female employees work overtime, while on average 1.8% of a firm's total working hours are performed from home.

Table 1: Descriptive statistics and correlation matrix of the main variables in the analyses on the leadership gap between full-time and part-time female employees

	Mean	SD	(1)	(2)	(3)	(4)
(1) leadership with supervisory responsibility _t	0.185	0.389	1.000			
(2) contractual working hours _{t-1}	33.020	7.697	0.188***	1.000		
(3) overtime culture	0.629	0.211	0.011	-0.087**	1.000	
(4) work-from-home policies	0.018	0.039	0.001	-0.024	0.171***	1.000

Notes: Descriptive statistics of individual-level variables (leadership with supervisory responsibility_t and contractual working hours_{t-1}) are based on 976 individual-level observations from 769 employees, descriptive statistics of establishment characteristics (overtime culture and work-from-home policies) are based on 343 establishments, mean and standard deviation of (1) and (2) at employee level and (3) and (4) at firm level, correlations are based on employee-year observations

Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

Several factors influence the probability of obtaining a leadership position with supervisory responsibility and need to be controlled for in an empirical analysis. Following the literature on supervisory responsibility, we control for factors at the individual level, job-related factors, and firm-level characteristics.

Individual level factors include whether the individual was born in Germany as a measure for ethnicity (Adamovic and Leibbrandt, 2023), age (De Neve et al., 2013), the number of children (Francis, 2017), a dummy variable for having a partner (Metz and Tharenou, 2001), and an employees' highest educational degree (W.-D. Li et al., 2011). Additionally, we control for employees' self-assessments to capture the Big Five personality traits (Doornenbal et al., 2022), work engagement (Sautier et al., 2015), an individual's level of commitment to the organization, and an employee's willingness to take risks. Job-related factors include participation in training at the workplace (Rothstein, 2001), an employee's overtime hours worked in the previous period, whether an individual has worked from home during her regular working time in the previous period, and occupational position.

Control variables at firm level include dummy variables for whether structural development plans exist, whether appraisal interviews exist, whether an employer offers flexible working hours to retain employees, and whether promotions are based on criteria such as personal competence or professional expertise. Finally, we control for the establishment size, the span

of control (Groschen and Krueger, 1990), the establishment's proportion of females (Yaish and Stier, 2009), and industry and regional factors.

2.3.3 Statistical method

The empirical analysis investigates the leadership gap between full-timers and part-timers in different corporate cultures. We estimate the probability of holding a leadership position with supervisory responsibility depending on contractual working hours using probit models with maximum likelihood (Stock and Watson, 2020, p. 401) as the dependent variable is binary. A one-period lag (Wooldridge, 2019, pp. 336–341) of the working hours variable is applied to exclude the argument that employees already holding leadership positions with supervisory responsibility choose to reduce their working hours. Due to the highly unbalanced panel, we pool the data over all waves and cluster standard errors at the employee level since individuals are more similar to themselves over time than to other individuals (Cameron and Trivedi, 2010, p. 335). To control for time, we include a dummy variable for each survey wave.

The regression equation of model (m1) to estimate the relation between contractual working hours and the probability of holding a leadership position to test hypothesis 1 reads as follows:

$$\begin{aligned} P(\text{leadership with supervisory responsibility}_{it} = 1 | \cdot) \\ = \Phi(\beta_0 + \beta_1 \text{contractual working hours}_{it-1} + \beta_2 \text{overtime culture}_i \\ + \beta_3 \text{work-from-home policies}_i + \boldsymbol{\gamma} \mathbf{controls} + \varepsilon_i) \end{aligned}$$

Φ is the cumulative distribution function of the standard normal distribution. **controls** is a vector of all control variables (individual level, job-related, firm-level) and dummy variables for each survey wave. $\boldsymbol{\gamma}$ is the vector of the estimated coefficients of the control variables. Based on these estimation results, we quantify the leadership gap between full-timers and part-timers with different contractual part-time arrangements. We first calculate the predicted probability of each employee in the sample being in a leadership position with supervisory responsibility at different numbers of contractual working hours. We then average the predicted probabilities at each contractual working time, so that we have the average probability of holding a leadership position in the sample at a range of working times. Finally, we assume a full-time working week of 40 hours and compute the difference between the average predicted probabilities for full-time workers and the different contractual part-time arrangements. This difference is the leadership gap between full-time and part-time employees, which varies for different degrees of part-time employment.

To test hypotheses 2 and 3, and to see how the work environment affects the leadership gap, models (m2) and (m3) additionally include an interaction term between lagged contractual

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working hours and overtime culture (model m2), respectively, work-from-home policies (model m3). The regression equation with interaction reads as follows:

$$\begin{aligned} P(\text{leadership with supervisory responsibility}_{it} = 1 | \cdot) \\ = \Phi(\delta_0 + \delta_1 \text{contractual working hours}_{it-1} + \delta_2 \text{overtime culture}_i \\ + \delta_3 \text{work-from-home policies}_i \\ + \delta_4 \text{contractual working hours}_{it-1} \cdot \text{moderator}_i + \boldsymbol{\psi} \text{controls} + \varepsilon_i) \end{aligned}$$

moderator_i is overtime culture in model (m2) and work-from-home policies in model (m3). $\boldsymbol{\psi}$ is the vector of the estimated coefficients of the control variables.

Based on the estimation results of these interaction models, we again calculate the leadership gap for different levels of part-time work, but also consider the full range of different work environments. Specifically, we calculate the difference between the average predicted probabilities of holding supervisory responsibility of full-timers and part-timers at different numbers of contractual working hours and at different points in the overtime culture and in the work-from-home policies.

Since endogeneity might be an issue, strictly speaking we identify a correlation rather than a causal effect. If an employee's working time is a consequence rather than an antecedent of holding a leadership position, simultaneous causality is conceivable. We attempt to mitigate this issue by lagging the main independent variable (contractual working hours) by one period, so that we measure working time in t-1 and holding a leadership position in t. In addition, selection of employees to certain firms and omitted variable bias could be problems. To address this concern, we have included many control variables from the economics and leadership literature at both the individual and the firm level. Nevertheless, we cannot completely rule out this type of endogeneity.

2.4 Results

In a first step, we test hypothesis 1 stating the leadership gap increases when the difference in contractual working hours between female full-timers and part-timers increases. First, we estimate the effect of contractual working hours on the probability of holding a leadership position with supervisory responsibility (Table 2, model m1). The probit estimations show that employees with additional contractual working hours significantly increase their probability of obtaining a leadership position with supervisory responsibility. Conversely, a decrease in contractual working hours significantly reduces the probability of holding a leadership position with supervisory responsibility.

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Table 2: Probit estimations of holding a leadership position with supervisory responsibility

	contractual working hours	moderation: overtime culture	moderation: work-from- home policies
	(m1)	(m2)	(m3)
contractual working hours t_{-1}	0.049*** (0.010)	-0.018 (0.027)	0.045*** (0.011)
overtime culture	0.016 (0.349)	-3.841*** (1.486)	0.014 (0.349)
work-from-home policies	-0.340 (1.546)	-0.299 (1.562)	-4.357 (5.633)
contractual working hours $t_{-1} \times$ overtime culture		0.109*** (0.042)	
contractual working hours $t_{-1} \times$ work-from-home policies			0.121 (0.174)
Employee characteristics			
country of birth: Germany (ref.: all other countries)	0.234 (0.300)	0.283 (0.295)	0.228 (0.299)
age	0.015** (0.007)	0.016** (0.007)	0.015** (0.007)
number of children	-0.178 (0.125)	-0.163 (0.129)	-0.179 (0.125)
partner (ref.: no partner)	0.334** (0.170)	0.317* (0.171)	0.327* (0.170)
extraversion	0.064 (0.090)	0.086 (0.089)	0.068 (0.089)
agreeableness	-0.182* (0.108)	-0.198* (0.110)	-0.181* (0.109)
conscientiousness	0.055 (0.149)	0.050 (0.149)	0.051 (0.149)
neuroticism	-0.140* (0.079)	-0.133* (0.080)	-0.142* (0.080)
openness	-0.070 (0.094)	-0.087 (0.095)	-0.070 (0.094)
vigor	-0.154 (0.102)	-0.139 (0.102)	-0.155 (0.102)
dedication	0.132 (0.134)	0.125 (0.132)	0.130 (0.134)
absorption	0.171 (0.113)	0.172 (0.110)	0.178 (0.114)
commitment	0.011 (0.014)	0.012 (0.014)	0.011 (0.014)
risk-seeking	0.018 (0.037)	0.020 (0.037)	0.018 (0.037)
educational level (ref.: apprenticeship)			
training college	-0.264 (0.182)	-0.265 (0.183)	-0.266 (0.182)
technical college	0.025 (0.197)	0.006 (0.198)	0.022 (0.197)
university degree	0.609*** (0.154)	0.608*** (0.155)	0.619*** (0.156)

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	contractual working hours	moderation: overtime culture	moderation: work-from- home policies
	(m1)	(m2)	(m3)
training at the workplace (ref: no training)	0.328*** (0.120)	0.346*** (0.121)	0.332*** (0.120)
occupational position (ref.: unskilled/semi-skilled worker)			
skilled worker	0.147 (0.268)	0.146 (0.266)	0.145 (0.268)
white-collar worker	0.130 (0.221)	0.130 (0.219)	0.131 (0.220)
overtime hours _{t-1}	0.041** (0.016)	0.043*** (0.016)	0.041** (0.016)
working from home (ref.: not working from home _{t-1})			
working from home not possible _{t-1}	-0.124 (0.187)	-0.130 (0.191)	-0.119 (0.187)
working from home _{t-1}	0.166 (0.236)	0.162 (0.241)	0.145 (0.238)
Establishment characteristics			
development plans (ref: no development plans)	0.002 (0.126)	-0.008 (0.126)	0.004 (0.126)
appraisal interviews (ref: no appraisal interviews)	-0.282** (0.143)	-0.270* (0.142)	-0.283** (0.143)
flexible working hours	-0.022 (0.061)	-0.022 (0.062)	-0.022 (0.061)
promotion based on professional expertise (ref: no)	-0.514 (0.335)	-0.504 (0.318)	-0.512 (0.333)
promotion based on personal competence (ref: no)	0.188 (0.213)	0.192 (0.212)	0.187 (0.213)
establishment size: small and medium-sized enterprises: 10–249 employees (ref.: large enterprises: 250 and more employees)	0.130 (0.139)	0.094 (0.140)	0.130 (0.139)
establishment's supervisor-to-staff ratio	7.615*** (2.762)	7.306*** (2.770)	7.567*** (2.758)
establishment's proportion of females	1.902*** (0.369)	1.942*** (0.366)	1.926*** (0.371)
constant	-4.322*** (1.153)	-2.041 (1.442)	-4.187*** (1.163)
number observations	976	976	976
number employees	769	769	769
number establishments	343	343	343
pseudo R-squared	0.246	0.252	0.246
correctly predicted	0.847	0.845	0.848

Notes: Dependent variable: leadership with supervisory responsibility_i; dummy variables for survey wave, state (16), and industry (11) included; skilled workers include forewomen; standard errors clustered at employee level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

Second, based on model (m1), we calculate the leadership gap – the difference in the average predicted probabilities of holding supervisory responsibility between full-timers and part-

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timers. Not surprisingly, row 1 of Table 3 shows that all average predicted probabilities of having a leadership position with supervisory responsibility are statistically different from 0 and increase with an employee's number of contractual working hours. A female full-time employee (in $t-1$) – assumed to work 40 hours a week – holds a leadership position with supervisory responsibility (in t) with an average predicted probability of 0.251. The corresponding probability for a female part-time employee on a 20-hour contract is 0.077 only. The resulting leadership gap for a female employee on a 20-hour contract thus is 0.175. In line with hypothesis 1, the gap is statistically significant and positive and decreases when the difference between full-timers' and part-timers' contractual working hours decreases.

In a second step, we analyze the impact of the work environment on the leadership gap between full-time and part-time female employees. First, we examine firm overtime culture; then, we inspect work-from-home policies. Hypothesis 2 states that if part-time employees increase their contractual working hours, the leadership gap decreases in a strong but not in a weak firm overtime culture. To test this proposition, we analyze whether and how the leadership gap varies in different overtime culture regimes and different degrees of part-time. Technically, the interaction of individual contractual working hours and firm overtime culture is relevant. Model (m2) in Table 2 displays a significant interaction coefficient, already suggesting that the relationship between contractual working hours and the probability of holding a leadership position depends on overtime culture. Based on model (m2) in Table 2, we calculate the leadership gaps at different contractual working hours across different levels of overtime culture which are displayed in Table 4. The results in the rows and the columns reveal two patterns: First, the rows of Table 4 show that the leadership gap increases with higher levels of overtime culture – for each number of contractual working hours. Second, the columns of Table 4 show that the leadership gap decreases with higher contractual working hours of part-timers – independent of the overtime culture. The white cells in Table 4 exhibit combinations of contractual working time and overtime culture that do not lead to a significant leadership gap between full-timers and part-timers. The darker the cells, the wider the gap. In firms with a strong overtime culture, the leadership gap between full-timers and part-timers is statistically significant for all degrees of part-time work. In firms with a weak overtime culture, the leadership gap is not statistically significant, that is, part-timers do not experience a disadvantage concerning leadership positions compared to full-time employees. Briefly, the leadership gap increases with a stronger overtime culture in a firm, and it decreases with higher numbers of working hours of part-timers. Consequently, the gap for part-timers with low

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working hours is biggest in firms where all employees work overtime. These results are in line with hypothesis 2.

Hypothesis 3 states that if part-time employees increase their contractual working hours, the leadership gap decreases in restricted work-from-home policies in a firm but not in widespread ones. To test this proposition, we analyze the interaction term between work-from-home policies and contractual working hours. Model (m3) in Table 2 displays a statistically insignificant interaction coefficient. Based on these results, we calculate the leadership gap at different contractual working hours across different levels of work-from-home policies which are displayed in Table 5.⁴

As with the results on overtime culture, the results in the rows of Table 5 show that the leadership gap increases as work-from-home policies become more restrictive. The columns of Table 5 indicate that the leadership gap decreases if part-timers have more contractual working hours. With respect to hypothesis 3, again, the colors of the cells are relevant. The white cells exhibit combinations of contractual working time and work-from-home policies that do not lead to a significant leadership gap between full-time and part-time employees. In firms, in which working from home is restricted, the leadership gap is statistically significant for all degrees of part-time work, while in firms, in which working from home is widespread, the leadership gap is statistically insignificant for all degrees of part-time work. In firms, in which work-from-home policies are moderately restricted, employees with very low degrees of part-time experience a disadvantage when they desire a leadership position, while employees with moderate and high degrees of part-time do not. Briefly, the leadership gap between female full-time and part-time employees increases when work-from-home policies are more restricted in a firm, and it decreases with higher numbers of working hours of part-timers which supports hypothesis 3. Taken together, the empirical results suggest that overtime culture and work-from-home policies are important for part-timers' chances of obtaining a leadership position with supervisory responsibility.

To investigate the robustness of the empirical results, we conduct several additional analyses. These address the operationalization of working time, time structure, and sampling issues. First, a key assumption is the linearity of working time. Deschacht (2017) suggests a non-linear relationship between working time and promotion into managerial or authority positions. Following the author's definition, we use two categories of working part-time.

⁴ While we are conscious of the fact that the maximum value of work-from-home policies in our sample is 0.286, we still predict the leadership gap for values of work-from-home policies ranging from 0 to 1.

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Table 3: Average predicted probabilities of holding a leadership position with supervisory responsibility at t for different levels of contractual working hours at $t-1$

	...at a contractual working hours $_{t-1}$ of ...							
	40 hours	35 hours	30 hours	25 hours	20 hours	15 hours	10 hours	5 hours
Average predicted probabilities of holding supervisory responsibility in t	0.251*** (0.021)	0.195*** (0.013)	0.147*** (0.013)	0.107*** (0.016)	0.077*** (0.017)	0.053*** (0.017)	0.036** (0.015)	0.024* (0.013)
Average predicted leadership gap	–	0.057***	0.105***	0.144***	0.175***	0.198***	0.215***	0.227***

Notes: The average predicted leadership gap: difference in the average predicted probabilities of holding supervisory responsibility between full-time employees (assumed to work 40 hours per week) and employees working different degrees of part-time (5, 10, 15, 20, 25, 30, 35 hours per week), standard errors of the predicted probabilities in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on Model (m1) of Table 2

Table 4: Leadership gap for different degrees of part-time across different overtime cultures

		overtime culture										
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
working hours $_{t-1}$	5	-0.160	-0.059	0.026	0.096	0.151**	0.192***	0.224***	0.249***	0.270***	0.288***	0.305***
	10	-0.134	-0.050	0.023	0.085	0.136**	0.178***	0.212***	0.239***	0.263***	0.283***	0.301***
	15	-0.108	-0.041	0.019	0.073	0.119**	0.159***	0.194***	0.224***	0.250***	0.273***	0.294***
	20	-0.084	-0.033	0.015	0.060	0.100**	0.137***	0.171***	0.201***	0.229***	0.254***	0.278***
	25	-0.061	-0.024	0.012	0.046	0.079*	0.110***	0.140***	0.169***	0.196***	0.222***	0.248***
	30	-0.040	-0.016	0.008	0.031	0.055*	0.079***	0.102***	0.125***	0.149***	0.172***	0.195***
	35	-0.019	-0.008	0.004	0.016	0.029*	0.042***	0.055***	0.069***	0.083***	0.098***	0.113***

Notes: Each cell displays the leadership gap (i.e., the difference in the average predicted probabilities of holding a leadership position with supervisory responsibility between full-time employees (40 hours per week) and employees working different degrees of part-time (5, 10, 15, 20, 25, 30, 35 hours per week)) across different levels of overtime culture (0: weak; 1: strong); * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (indicating the leadership gap to be statistically different from 0). The darker the cells, the wider the gap.

Source: Own calculations based on Model (m2) of Table 2

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Table 5: Leadership gap for different degrees of part-time across different work-from-home policies

	work-from-home policies										
	1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0
5	0.379	0.365	0.351	0.337	0.323	0.310	0.296	0.281*	0.265**	0.245***	0.219***
10	0.379	0.364	0.351	0.337	0.232	0.308	0.293	0.277	0.258**	0.235***	0.206***
15	0.379	0.361	0.350	0.335	0.320	0.304	0.287	0.268	0.246**	0.219***	0.188***
20	0.377	0.348	0.345	0.329	0.312	0.293	0.273	0.250	0.225**	0.197***	0.164***
25	0.366	0.304	0.329	0.310	0.289	0.027	0.244	0.022	0.193*	0.165***	0.135***
30	0.324	0.194	0.283	0.261	0.239	0.217	0.194	0.170	0.147*	0.122***	0.097***
35	0.211	0.379	0.178	0.161	0.145	0.129	0.113	0.098	0.082*	0.067***	0.053***

Notes: Each cell displays the leadership gap (i.e., the difference in the average predicted probabilities of holding a leadership position with supervisory responsibility between full-time employees (40 hours per week) and employees working different degrees of part-time (5, 10, 15, 20, 25, 30, 35 hours per week)) across different levels of work-from-home policies (0: restricted; 1: widespread); * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (indicating the leadership gap to be statistically different from 0). The darker the cells, the wider the gap.

Source: Own calculations based on Model (m3) of Table 2

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Model (r1) in Table 6 shows that female employees working in the different part-time categories have a lower probability of supervisory responsibility compared to female full-time employees, which is consistent with the results in model (m1). The results of the moderations (models (r2) and (r3)) and the pattern of the leadership gaps of the main analyses remain qualitatively the same except for the interaction between high part-time work and overtime culture in model (r2). This could be due to the small number of observations in this category but does not contradict our conjecture that part-time employees are heterogeneous.

Second, we run a panel probit model to address the time structure. Since our panel with four waves is very short and highly unbalanced, a random-effects model is preferred over a fixed-effects model. Model (r4) in Table 6 confirms the statistically significant relationship between contractual working hours and the probability of holding a leadership position with supervisory responsibility. The results of the moderations (models (r5) and (r6)) and the pattern of the leadership gaps are also in line with those of the pooled probit model.

Third, sample selection can be problematic. On the one hand, some jobs do not allow working from home, resulting in employees being always present on-site. This leads us to restrict the sample to employees for whom it is technically possible to work from home (models (r7)–(r9), Table 7). On the other hand, part-time leadership is only an issue for employees in jobs where a leadership position with supervisory responsibility is possible. We, therefore, exclude unskilled and semi-skilled workers (models (r10)–(r12), Table 7). A third selection issue may be due to the presence of children, as part-time work may be used to combine family responsibilities and work. Women with children may have different career aspirations regarding leadership positions. To address this issue, we exclude women with children under the age of 14 years (models (r13)–(r15), Table 7). The results of the analyses and the patterns of the corresponding leadership gaps of these subsamples are robust.

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Table 6: Robustness checks: Measurement and time

	categorical working hours			random effects		
	(r1)	(r2)	(r3)	(r4)	(r5)	(r6)
contractual working hours _{t-1} : ≤ 25	-0.831*** (0.190)	1.179** (0.576)	-0.794*** (0.206)			
contractual working hours _{t-1} : 25 < .< 35	-0.360** (0.176)	-1.118* (0.613)	-0.286 (0.189)			
contractual working hours _{t-1} : ≥ 35	ref.	ref.	ref.			
contractual working hours _{t-1} : ≤ 25 × overtime culture		-3.376*** (0.962)				
contractual working hours _{t-1} : 25 < .< 35 × overtime culture		1.127 (0.930)				
contractual working hours _{t-1} : ≤ 25 × work-from-home policies			-1.436 (2.935)			
contractual working hours _{t-1} : 25 < .< 35 × work-from-home policies			-3.142 (2.707)			
contractual working hours				0.146*** (0.042)	-0.019 (0.068)	0.146*** (0.041)
overtime culture	-0.044 (0.347)	0.196 (0.399)	-0.050 (0.347)	0.105 (0.865)	-9.187** (4.143)	0.107 (0.859)
work-from-home policies	-0.356 (1.560)	0.020 (1.611)	0.423 (1.967)	-0.741 (3.533)	-0.803 (3.439)	0.338 (16.902)
contractual working hours × overtime culture					0.261** (0.117)	
contractual working hours × work-from-home policies						-0.031 (0.492)
employee level controls	yes	yes	yes	yes	yes	yes
establishment level controls	yes	yes	yes	yes	yes	yes
number of observations	976	976	976	976	976	976
number of employees	769	769	769	769	769	769
number of establishments	343	343	343	343	343	343
pseudo -R ² /correctly predicted (r1–r3)/log pseudo-likelihood (r4–r6)	0.241/0.846	0.260/0.840	0.242/0.845	-324.314	-322.130	-324.354

Notes: Dependent variable: leadership with supervisory responsibility_i; dummy variables for survey wave, state (16), and industry (11) included; employee and establishment characteristic controls as in model (m1) of Table 2; standard errors clustered at employee level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

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Table 7: Robustness checks: Sample restriction

	Subsample: working from home possible			Subsample: without unskilled and semi-skilled employees			Subsample: employees without children		
	(r7)	(r8)	(r9)	(r10)	(r11)	(r12)	(r13)	(r14)	(r15)
contractual working hours _{t-1}	0.057*** (0.014)	-0.008 (0.032)	0.048*** (0.014)	0.050*** (0.011)	-0.012 (0.031)	0.046*** (0.012)	0.051*** (0.011)	-0.017 (0.030)	0.046*** (0.012)
overtime culture	0.270 (0.444)	-3.419** (1.721)	0.271 (0.444)	-0.006 (0.377)	-3.447** (1.669)	-0.005 (0.378)	0.018 (0.387)	-3.984** (1.736)	0.017 (0.386)
work-from-home policies	0.152 (2.098)	0.183 (2.116)	-11.599 (7.785)	0.191 (1.568)	0.231 (1.581)	-3.859 (5.335)	-0.498 (1.732)	-0.394 (1.751)	-5.471 (7.195)
contractual working hours _{t-1} × overtime culture		0.104** (0.049)			0.098** (0.047)			0.112** (0.048)	
contractual working hours _{t-1} × work-from-home policies			0.334 (0.238)			0.121 (0.168)			0.148 (0.211)
employee level controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
establishment level controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
number of observations	622	622	622	870	870	870	791	791	791
number of individuals	575	575	575	689	689	689	633	633	633
number of establishments	276	276	276	321	321	321	306	306	306
pseudo R-squared	0.318	0.322	0.321	0.269	0.274	0.270	0.248	0.254	0.249
correctly predicted	0.849	0.847	0.844	0.849	0.845	0.849	0.833	0.834	0.833

Notes: Dependent variable: leadership with supervisory responsibility_{it}; dummy variables for survey wave, state (16), and industry (11) included; employee and establishment characteristic controls as in model (m1) of Table 2; standard errors clustered at the employee level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

2.5 Discussion

This study has provided insights into the negative relationship between different degrees of part-time employment and leadership positions in Germany. We complement two strands of literature on working time and leadership. First, female part-time employees are less likely to hold leadership positions (Fietze et al., 2011; Huffman and Cohen, 2004; Rosenfeld et al., 1998) and second, part-time employees are less likely than their full-time counterparts to be promoted at all (Pfeifer, 2010; Zeytinoglu and Cooke, 2008) and specifically to leadership positions with supervisory responsibility (Deschacht, 2017). We go one step further and unlock the black box of part-time employees by explicitly considering the number of contractual working hours for holding a leadership position and quantifying the leadership gap between full-time and part-time employees.

While it is plausible that working time can signal work engagement and thus positively affect obtaining a leadership position with supervisory responsibility, it is far less obvious that the effectiveness of this signal depends on the work environment and the employer's perception. The empirical results show that the effect of contractual working time is contingent on employers' expectations of employee visibility and availability, which we capture through the overtime culture and the work-from-home policies of a firm. Our findings extend the qualitative literature that emphasizes that workplace presence (Adams, 1995; Bleijenbergh et al., 2016; M. D. Lee et al., 2002; Sheridan, 2004) and employee visibility (McDonald et al., 2008) impede the career advancement of part-time employees. Additionally, our results support the theoretical considerations that the signaling environment, i.e. the work environment, matters for the perception of the contractual working hours signal. Briefly, our analysis quantifies this joint effect of contractual working time and the work environment, overtime culture and work-from-home policies, on part-timers' likelihood of being in a leadership position.

2.5.1 Practical implications

For part-time employees who aspire to a leadership position with supervisory responsibility two aspects are relevant. First, it is advantageous to choose a high contractual working time because each additional hour increases the chances of obtaining a leadership position with supervisory responsibility. Second, the effect of contractual working time depends on the work environment. If overtime is common in a firm or if working from home is restricted, it is difficult to obtain a leadership position on a part-time basis. Therefore, applying for or staying in a firm with a liberal work attendance environment seems promising, as employers in such environments – on average – do not interpret reduced working hours as a lack of work

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engagement. While employees can observe a work environment while working, applicants can try to disclose it during their job interview. This finding helps to improve the fit between an employee and a firm in terms of their requirements related to contractual working hours and obtaining a leadership position with supervisory responsibility. Organizations can actively support the quality of the match by credibly promoting information about their work environment, such as overtime culture and work-from-home policies, to attract part-timers interested in leadership positions.

Employers may find it attractive, especially in times of skills and management shortage, to draw on qualified and skilled part-time employees to fill leadership positions (Baldiga, 2005; Barnett and Hall, 2001). In this vein, creating a liberal attendance environment in the workplace, can encourage part-time leadership and attract candidates. Employers can reorganize business processes to make overtime less common or help managers evaluate employees on output rather than on hours worked, so that employees do not see overtime as an expectation. A weak overtime culture may then lead to qualified female part-timers self-selecting into leadership positions in these firms. Regarding working from home, the Covid pandemic has shown the feasibility of remote work across various occupations, so that employers are likely to continue to relax working time rules and generously granting work-from-home opportunities and therefore putting more emphasis on output controls than visibility (Groen et al., 2018). Formulating concrete liberal work-from-home policies may reduce the leadership gap between full- and part-timers and thus foster part-time leadership. We predict that these organizational changes will reduce the influence of work environment and work arrangements on the distribution of leadership positions within firms.

Work environments enabling part-time leadership will in turn probably affect work organization. First, distributing leadership positions to part-timers can result in a particular form of shared leadership, which has been shown to be an effective management tool in professional teams (Muethel and Hoegl, 2013). Second, attracting female leaders – the largest group of employees who work part-time – can be beneficial for firms as they are more “other-oriented” than men concerning working time arrangements, which may improve all employees’ work-life balance (Devicienti et al., 2019; Pasamar and Alegre, 2015). This, in turn, may foster a more inclusive workplace culture. Having more female leaders has also been found to reduce gender-pay disparities within organizations (Kalogeraki and Georgakakis, 2022). By actively promoting part-time leadership opportunities and creating supportive work environments for this, organizations can not only address gender inequities but also build more sustainable and equitable workplaces, which is particularly beneficial in times of skill shortages.

2.5.2 Limitations and further research

Although the theoretical argument is concisely developed and the empirical results are discussed in the light of several robustness checks, this study has limitations and offers room for further research. First, our theoretical argument relies on the assumption that employees can choose their contractual working time. In reality, this is an oversimplification and may not be true. Similarly, we cannot distinguish between voluntary and involuntary part-time employment in our data. Since involuntary part-time employment is not pronounced in Germany (Eurostat, 2023b), we do not consider it an issue in our analyses. Nevertheless, future research could emphasize voluntary and involuntary reductions in working time when investigating part-time leadership.

Second, our empirical analysis is based on female employees only. This is motivated by the fact that the majority of part-timers in Germany are female. Although this is an interesting phenomenon in itself, it would be worthwhile to examine the leadership gap between men and women, especially because women are underrepresented in leadership positions. In this sense, also quantifying and comparing the leadership gap between full-timers and part-timers for men and women would explicitly contribute to understanding the gender gap in leadership. In this vein, conducting a more detailed examination of the prevalence of children and their influence on part-time leadership could also prove to be promising for further research, as children not only influence the decisions about contractual working hours, but also shape the career aspirations of their parents. With the changing working time preferences of Generation X, part-time work, and therefore leadership in part-time, may also become relevant for men in the coming years. Further research is needed to explore part-time work and leadership positions with supervisory responsibility for men.

Third, the restriction of the sample to Germany is a valid starting point for drawing a picture of West-European countries. Future empirical studies could, however, extend the understanding in different institutional settings, e.g., such as working time regulations or childcare facilities other than in Germany. Additionally, analyses of data from Eastern European countries where part-time work is not a female phenomenon – e.g. in Romania (or Bulgaria) about 62 (54) percent of all part-timers are male (Eurostat, 2023a) – could provide a more complete picture of part-time leadership. It would also be interesting to analyze the role of institutional arrangements in a comparative setting.

Fourth, while we find that a firm's overtime culture and work-from-home policies moderate the leadership gap between full-time and part-time female employees, future research could investigate whether these work environments also moderate other gaps, such as the gender pay

gap. This would contribute to another strand of research that highlights long working hours and inflexible working conditions as important drivers of the persistent gender pay gap (Cortés and Pan, 2019; Goldin, 2014). Conversely, it would be valuable to examine how other work environments, such as flexible working arrangements, affect the leadership gap between full-time and part-time employees as well as the gender pay gap.

Fifth, employers and employees have gained considerable experience of working from home during the pandemic. In the coming years, it would be valuable to examine the relationship between working from home and the career prospects of part-time workers, before and after the pandemic. This would reveal whether the importance of visibility in the workplace has diminished following a radical change in the work environment.

Finally, to address the empirical issue of potential endogeneity, further research should use longer panels to observe within-person variation into and out of leadership positions.

2.6 Conclusion

Part-time workers are less available and less visible – and that matters. This study has described one of the consequences of working part-time as the leadership gap – the fact that full-timers tend to hold leadership positions more often than part-timers. This leadership gap has many causes, including that part-time workers are different and that managers attribute different characteristics to part-timers compared to full-timers.

To disentangle these facets, we focus on the difference between full-time and contractual working hours for each employee in our sample, allowing for different degrees of part-time work, rather than simply dichotomizing employees as part-time and full-time. While this strategy reduces the bias arising from the different characteristics of part-time and full-time employees, it does not eliminate the possibility that part-timers may simply be different from full-timers. More importantly, this study has also shed some light on the role of the work environment serving as a strong conditioning factor for the size of the leadership gap. Our empirical results show that the leadership gap varies across firms with different overtime cultures and work-from-home policies. In a world, where only individual characteristics influence the leadership gap, the work environment's impact on the leadership gap would be minimal. However, this study highlights that managers do consider part-time employment as an adverse signal for leadership positions.

Our findings paint a more nuanced picture of the relationship between part-time work and leadership than previous studies have suggested. Part-time work is certainly not incompatible with leadership positions, but rather reduces the likelihood of holding a leadership position.

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This negative effect seems to be present across companies and increases as the number of contractual working hours declines relative to full-time employment. Companies with strict attendance regimes also tend to have wider leadership gaps. Ultimately, this research suggests that part-time work and leadership is compatible – if the reduction in hours is not too large and if part-time workers aspiring to leadership positions consider the work environment of prospective companies or actively try to craft their current company's work environment to improve their chances of advancement.

2.7 Appendix

Table 8: Robustness checks: Measurement and time (showing the coefficients of all control variables)⁵

	categorical working hours			random effects		
	(r1)	(r2)	(r3)	(r4)	(r5)	(r6)
contractual working hours _{t-1} : ≤ 25	-0.831*** (0.190)	1.179** (0.576)	-0.794*** (0.206)			
contractual working hours _{t-1} : 25 < . < 35	-0.360** (0.176)	-1.118* (0.613)	-0.286 (0.189)			
contractual working hours _{t-1} : ≥ 35	ref.	ref.	ref.			
contractual working hours _{t-1} : ≤ 25 × overtime culture		-3.376*** (0.962)				
contractual working hours _{t-1} : 25 < . < 35 × overtime culture		1.127 (0.930)				
contractual working hours _{t-1} : ≤ 25 × work-from-home policies			-1.436 (2.935)			
contractual working hours _{t-1} : 25 < . < 35 × work-from-home policies			-3.142 (2.707)			
contractual working hours				0.146*** (0.042)	-0.019 (0.068)	0.146*** (0.041)
overtime culture	-0.044 (0.347)	0.196 (0.399)	-0.050 (0.347)	0.105 (0.865)	-9.187** (4.143)	0.107 (0.859)
work-from-home policies	-0.356 (1.560)	0.020 (1.611)	0.423 (1.967)	-0.741 (3.533)	-0.803 (3.439)	0.338 (16.902)
contractual working hours × overtime culture					0.261** (0.117)	
contractual working hours × work-from-home policies						-0.031 (0.492)
Employee characteristics						
country of birth: Germany (ref.: all other countries)	0.252 (0.300)	0.354 (0.290)	0.252 (0.300)	0.361 (0.698)	0.499 (0.662)	0.359 (0.694)

⁵ This table is not part of the paper submitted to the *European Management Journal*.

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	categorical working hours			random effects		
	(r1)	(r2)	(r3)	(r4)	(r5)	(r6)
age	0.015** (0.007)	0.015** (0.007)	0.015** (0.007)	0.043** (0.019)	0.042** (0.018)	0.043** (0.019)
number of children	-0.189 (0.124)	-0.171 (0.129)	-0.189 (0.124)	-0.434 (0.320)	-0.383 (0.310)	-0.431 (0.317)
partner (ref.: no partner)	0.336** (0.171)	0.329* (0.172)	0.336** (0.171)	0.929** (0.463)	0.858* (0.443)	0.925** (0.456)
extraversion	0.067 (0.090)	0.084 (0.090)	0.068 (0.090)	0.060 (0.217)	0.095 (0.210)	0.059 (0.214)
agreeableness	-0.188* (0.107)	-0.205* (0.110)	-0.184* (0.108)	-0.456 (0.284)	-0.457* (0.274)	-0.453 (0.282)
conscientiousness	0.061 (0.151)	0.068 (0.151)	0.057 (0.150)	-0.007 (0.372)	-0.021 (0.354)	-0.007 (0.370)
neuroticism	-0.144* (0.079)	-0.150* (0.082)	-0.142* (0.080)	-0.390* (0.211)	-0.362* (0.200)	-0.387* (0.209)
openness	-0.078 (0.095)	-0.096 (0.099)	-0.082 (0.095)	-0.087 (0.227)	-0.118 (0.222)	-0.087 (0.226)
vigor	-0.157 (0.102)	-0.157 (0.101)	-0.158 (0.102)	-0.428* (0.245)	-0.386 (0.235)	-0.425* (0.243)
dedication	0.148 (0.135)	0.150 (0.130)	0.152 (0.135)	0.315 (0.314)	0.311 (0.299)	0.314 (0.313)
absorption	0.156 (0.112)	0.145 (0.109)	0.157 (0.113)	0.352 (0.258)	0.325 (0.242)	0.349 (0.259)
commitment	0.010 (0.013)	0.013 (0.014)	0.010 (0.013)	0.032 (0.034)	0.033 (0.033)	0.032 (0.033)
risk-seeking	0.021 (0.037)	0.022 (0.038)	0.021 (0.037)	0.066 (0.091)	0.065 (0.087)	0.066 (0.090)
educational level (ref.: apprenticeship)						
training college	-0.254 (0.183)	-0.291 (0.185)	-0.252 (0.183)	-0.535 (0.450)	-0.480 (0.438)	-0.532 (0.447)
technical college	0.048 (0.196)	-0.002 (0.198)	0.045 (0.197)	-0.037 (0.482)	-0.067 (0.466)	-0.036 (0.478)
university degree	0.611*** (0.155)	0.611*** (0.157)	0.617*** (0.156)	1.569*** (0.515)	1.526*** (0.481)	1.554*** (0.509)

2 The leadership gap between full-time and part-time female employees

	categorical working hours			random effects		
	(r1)	(r2)	(r3)	(r4)	(r5)	(r6)
training at the workplace (ref: no training)	0.350*** (0.119)	0.365*** (0.121)	0.355*** (0.120)	0.724** (0.302)	0.714** (0.291)	0.720** (0.299)
occupational position (ref.: unskilled/semi-skilled worker)						
skilled worker	0.137 (0.266)	0.201 (0.264)	0.130 (0.266)	0.300 (0.529)	0.289 (0.514)	0.298 (0.525)
white-collar worker	0.115 (0.219)	0.170 (0.221)	0.111 (0.219)			
overtime hours _{t-1}	0.041** (0.016)	0.046*** (0.016)	0.040** (0.016)			
working from home (ref.: not working from home _{t-1})						
working from home not possible _{t-1}	0.175 (0.232)	0.135 (0.235)	0.159 (0.233)			
working from home _{t-1}	-0.140 (0.188)	-0.139 (0.193)	-0.141 (0.188)			
Establishment characteristics						
development plans (ref: no development plans)	-0.002 (0.127)	-0.005 (0.127)	0.002 (0.127)	0.069 (0.299)	0.050 (0.289)	0.066 (0.296)
appraisal interviews (ref: no appraisal interviews)	-0.307** (0.142)	-0.313** (0.143)	-0.315** (0.142)	-0.574 (0.366)	-0.521 (0.344)	-0.568 (0.362)
flexible working hours	-0.017 (0.061)	-0.026 (0.062)	-0.018 (0.061)	-0.124 (0.141)	-0.118 (0.137)	-0.123 (0.140)
promotion based on professional expertise (ref: no)	-0.524 (0.322)	-0.456 (0.317)	-0.519 (0.321)	-0.843 (0.830)	-0.901 (0.796)	-0.838 (0.824)
promotion based on personal competence (ref: no)	0.188 (0.212)	0.165 (0.213)	0.185 (0.213)	0.692 (0.551)	0.647 (0.519)	0.684 (0.542)
establishment size: small and medium-sized enterprises: 10–249 employees (ref.: large enterprises: 250 and more employees)	0.126 (0.139)	0.092 (0.143)	0.128 (0.139)	0.280 (0.339)	0.198 (0.325)	0.277 (0.336)
establishment's supervisor-to-staff ratio	7.859*** (2.756)	7.312** (2.979)	7.747*** (2.750)	16.265** (7.497)	14.853** (7.159)	16.173** (7.385)
establishment's proportion of females	1.877*** (0.374)	1.982*** (0.377)	1.899*** (0.374)	4.080*** (1.184)	4.047*** (1.107)	4.048*** (1.165)

2 The leadership gap between full-time and part-time female employees

	categorical working hours			random effects		
	(r1)	(r2)	(r3)	(r4)	(r5)	(r6)
constant	-2.361** (1.057)	-2.664** (1.071)	-2.382** (1.056)	-9.960*** (3.857)	-3.977 (3.723)	-9.915*** (3.715)
number observations	976	976	976	976	976	976
number employees	769	769	769	769	769	769
number establishments	343	343	343	343	343	343
pseudo -R ² /correctly predicted (r1–r3)/log pseudo-likelihood (r4–r6)	0.241/0.846	0.260/0.840	0.242/0.845	-324.314	-322.130	-324.354

Notes: Dependent variable: leadership with supervisory responsibility_{*i*}; dummy variables for survey wave, state (16), and industry (11) included; standard errors clustered at employee level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

Table 9: Robustness checks: Sample restriction (showing the coefficients of all control variables)⁶

	Subsample: working from home possible			Subsample: without unskilled and semi-skilled employees			Subsample: employees without children		
	(r7)	(r8)	(r9)	(r10)	(r11)	(r12)	(r13)	(r14)	(r15)
contractual working hours t_{-1}	0.057*** (0.014)	-0.008 (0.032)	0.048*** (0.014)	0.050*** (0.011)	-0.012 (0.031)	0.046*** (0.012)	0.051*** (0.011)	-0.017 (0.030)	0.046*** (0.012)
overtime culture	0.270 (0.444)	-3.419** (1.721)	0.271 (0.444)	-0.006 (0.377)	-3.447** (1.669)	-0.005 (0.378)	0.018 (0.387)	-3.984** (1.736)	0.017 (0.386)
work-from-home policies	0.152 (2.098)	0.183 (2.116)	-11.599 (7.785)	0.191 (1.568)	0.231 (1.581)	-3.859 (5.335)	-0.498 (1.732)	-0.394 (1.751)	-5.471 (7.195)
contractual working hours t_{-1} × overtime culture		0.104** (0.049)			0.098** (0.047)			0.112** (0.048)	
contractual working hours t_{-1} × work-from-home policies			0.334 (0.238)			0.121 (0.168)			0.148 (0.211)
Employee characteristics									
country of birth: Germany (ref.: all other countries)	0.083 (0.370)	0.106 (0.370)	0.091 (0.367)	0.389 (0.324)	0.401 (0.322)	0.378 (0.323)	0.367 (0.330)	0.418 (0.324)	0.358 (0.329)

⁶ This table is not part of the paper submitted to the *European Management Journal*.

2 The leadership gap between full-time and part-time female employees

	Subsample: working from home possible			Subsample: without unskilled and semi-skilled employees			Subsample: employees without children		
	(r7)	(r8)	(r9)	(r10)	(r11)	(r12)	(r13)	(r14)	(r15)
age	0.022** (0.010)	0.023** (0.010)	0.023** (0.010)	0.021*** (0.008)	0.022*** (0.008)	0.021*** (0.007)	0.016** (0.008)	0.016** (0.008)	0.015* (0.008)
number of children	-0.189 (0.150)	-0.157 (0.151)	-0.181 (0.149)	-0.129 (0.131)	-0.115 (0.133)	-0.130 (0.130)	0.000 (.)	0.000 (.)	0.000 (.)
partner (ref.: no partner)	0.404* (0.208)	0.404* (0.211)	0.394* (0.208)	0.230 (0.180)	0.210 (0.181)	0.222 (0.180)	0.355** (0.176)	0.337* (0.178)	0.348** (0.177)
extraversion	0.077 (0.112)	0.091 (0.111)	0.083 (0.112)	0.167* (0.097)	0.181* (0.096)	0.171* (0.097)	0.080 (0.096)	0.106 (0.094)	0.086 (0.095)
agreeableness	-0.252* (0.137)	-0.275** (0.137)	-0.246* (0.137)	-0.308*** (0.118)	-0.323*** (0.118)	-0.308*** (0.118)	-0.125 (0.118)	-0.142 (0.120)	-0.124 (0.118)
conscientiousness	-0.206 (0.190)	-0.200 (0.189)	-0.220 (0.189)	0.095 (0.157)	0.096 (0.157)	0.090 (0.157)	-0.017 (0.158)	-0.032 (0.156)	-0.023 (0.157)
neuroticism	-0.087 (0.101)	-0.093 (0.101)	-0.086 (0.101)	-0.155* (0.088)	-0.152* (0.088)	-0.157* (0.089)	-0.161* (0.089)	-0.157* (0.089)	-0.163* (0.089)
openness	0.122 (0.122)	0.109 (0.123)	0.124 (0.122)	-0.045 (0.104)	-0.056 (0.105)	-0.044 (0.104)	-0.117 (0.102)	-0.125 (0.102)	-0.117 (0.102)
vigor	-0.257* (0.138)	-0.254* (0.139)	-0.261* (0.137)	-0.030 (0.107)	-0.017 (0.107)	-0.031 (0.107)	-0.134 (0.110)	-0.117 (0.110)	-0.137 (0.111)
dedication	0.318** (0.160)	0.313* (0.160)	0.317** (0.160)	0.106 (0.131)	0.077 (0.131)	0.101 (0.131)	0.147 (0.143)	0.143 (0.141)	0.147 (0.143)
absorption	0.043 (0.141)	0.042 (0.141)	0.053 (0.141)	0.124 (0.110)	0.135 (0.110)	0.132 (0.111)	0.178 (0.122)	0.176 (0.119)	0.185 (0.123)
commitment	-0.008 (0.019)	-0.007 (0.019)	-0.008 (0.019)	0.014 (0.015)	0.016 (0.014)	0.014 (0.015)	0.003 (0.015)	0.005 (0.015)	0.003 (0.015)
risk-seeking	-0.036 (0.047)	-0.036 (0.047)	-0.037 (0.047)	-0.011 (0.041)	-0.008 (0.041)	-0.011 (0.041)	0.020 (0.040)	0.023 (0.040)	0.020 (0.040)
educational level (ref.: apprenticeship)									
training college	-0.308 (0.248)	-0.328 (0.246)	-0.310 (0.246)	-0.328 (0.201)	-0.313 (0.204)	-0.330 (0.201)	-0.153 (0.193)	-0.138 (0.194)	-0.152 (0.192)
technical college	-0.071 (0.252)	-0.093 (0.250)	-0.097 (0.254)	0.020 (0.207)	0.009 (0.208)	0.018 (0.207)	0.048 (0.220)	0.023 (0.223)	0.043 (0.221)

2 The leadership gap between full-time and part-time female employees

	Subsample: working from home possible			Subsample: without unskilled and semi-skilled employees			Subsample: employees without children		
	(r7)	(r8)	(r9)	(r10)	(r11)	(r12)	(r13)	(r14)	(r15)
university degree	0.731*** (0.180)	0.742*** (0.183)	0.738*** (0.182)	0.629*** (0.154)	0.634*** (0.154)	0.640*** (0.155)	0.667*** (0.174)	0.661*** (0.175)	0.682*** (0.176)
training at the workplace (ref: no training)	0.556*** (0.153)	0.561*** (0.154)	0.569*** (0.155)	0.344*** (0.125)	0.363*** (0.126)	0.347*** (0.126)	0.349*** (0.133)	0.358*** (0.133)	0.353*** (0.133)
occupational position (ref.: unskilled/semi-skilled worker)									
skilled worker	-0.214 (0.349)	-0.224 (0.350)	-0.217 (0.348)	0.033 (0.233)	0.040 (0.231)	0.032 (0.232)	0.207 (0.278)	0.205 (0.276)	0.202 (0.277)
white-collar worker	-0.206 (0.272)	-0.211 (0.272)	-0.202 (0.271)	0.000 (.)	0.000 (.)	0.000 (.)	0.113 (0.227)	0.120 (0.223)	0.111 (0.226)
overtime hours _{t-1}	0.042** (0.021)	0.046** (0.020)	0.042** (0.021)	0.034** (0.017)	0.036** (0.017)	0.033* (0.017)	0.031* (0.018)	0.034* (0.018)	0.030* (0.018)
working from home (ref.: not working from home _{t-1})									
working from home not possible _{t-1}	0.168 (0.271)	0.156 (0.277)	0.126 (0.273)	0.137 (0.238)	0.130 (0.242)	0.115 (0.241)	0.232 (0.263)	0.219 (0.267)	0.209 (0.264)
working from home _{t-1}				-0.115 (0.195)	-0.119 (0.197)	-0.110 (0.195)	-0.179 (0.194)	-0.181 (0.197)	-0.172 (0.193)
Establishment characteristics									
development plans (ref: no development plans)	0.147 (0.160)	0.135 (0.161)	0.152 (0.160)	-0.069 (0.132)	-0.074 (0.132)	-0.068 (0.131)	0.114 (0.136)	0.106 (0.136)	0.115 (0.136)
appraisal interviews (ref: no appraisal interviews)	-0.370* (0.197)	-0.362* (0.196)	-0.372* (0.195)	-0.255* (0.154)	-0.252* (0.152)	-0.257* (0.153)	-0.394*** (0.152)	-0.380** (0.150)	-0.396*** (0.151)
flexible working hours	-0.069 (0.082)	-0.059 (0.082)	-0.070 (0.082)	-0.030 (0.069)	-0.031 (0.069)	-0.030 (0.069)	0.007 (0.066)	0.005 (0.066)	0.007 (0.066)

2 The leadership gap between full-time and part-time female employees

	Subsample: working from home possible			Subsample: without unskilled and semi-skilled employees			Subsample: employees without children		
	(r7)	(r8)	(r9)	(r10)	(r11)	(r12)	(r13)	(r14)	(r15)
promotion based on professional expertise (ref: no)	-0.834* (0.428)	-0.844** (0.410)	-0.811* (0.422)	-0.549 (0.369)	-0.539 (0.350)	-0.545 (0.367)	-0.568 (0.373)	-0.550 (0.350)	-0.565 (0.371)
promotion based on personal competence (ref: no)	0.251 (0.246)	0.263 (0.245)	0.257 (0.246)	0.386* (0.228)	0.386* (0.227)	0.385* (0.228)	0.235 (0.242)	0.237 (0.240)	0.232 (0.242)
establishment size: small and medium-sized enterprises: 10–249 employees (ref.: large enterprises: 250 and more employees)	0.289 (0.182)	0.255 (0.182)	0.290 (0.182)	0.213 (0.152)	0.180 (0.153)	0.212 (0.151)	0.129 (0.150)	0.098 (0.150)	0.131 (0.149)
establishment's supervisor-to-staff ratio	11.443*** (3.870)	11.081*** (3.877)	11.390*** (3.861)	9.608*** (3.098)	9.481*** (3.096)	9.585*** (3.089)	5.657* (3.253)	5.666* (3.236)	5.578* (3.252)
establishment's proportion of females	1.724*** (0.464)	1.731*** (0.459)	1.772*** (0.469)	1.776*** (0.388)	1.813*** (0.385)	1.800*** (0.390)	2.137*** (0.399)	2.188*** (0.397)	2.164*** (0.399)
constant	-3.207** (1.491)	-0.920 (1.831)	-2.989** (1.481)	-4.831*** (1.227)	-2.685* (1.581)	-4.678*** (1.236)	-4.382*** (1.222)	-2.076 (1.563)	-4.222*** (1.231)
number of observations	622	622	622	870	870	870	791	791	791
number of individuals	575	575	575	689	689	689	633	633	633
number of establishments	276	276	276	321	321	321	306	306	306
pseudo R-squared	0.318	0.322	0.321	0.269	0.274	0.270	0.248	0.254	0.249
correctly predicted	0.849	0.847	0.844	0.849	0.845	0.849	0.833	0.834	0.833

Notes: Dependent variable: leadership with supervisory responsibility_i; dummy variables for survey wave, state (16), and industry (11) included; standard errors clustered at employee level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2012–2019 and the IAB Establishment Panel 2012–2019

2 The leadership gap between full-time and part-time female employees

Table 10: Definitions and descriptions of all variables used in the analyses on the leadership gap between full-time and part-time female employees⁷

Variable name (label Do-File)	Original variable(s)	Dataset(s)	Description
supervisory responsibility _t (PV)	mleitung	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual supervises others • 0, otherwise
working hours _{t-1} (Arbeitsstunden t1)	maz_vertrag	lpp_employee	contractual weekly working hours (in hours)
overtime culture (Überstunden Anteil)	maz_gesamt, maz_vertrag	lpp_employee	the proportion of surveyed employees in an establishment that work overtime
work-from-home policies (Anteil_HO_Stunden)	mheimstd, mheim, mheim_tageszeit_a, mheim_tageszeit_b, mheim_kompno, mheim_wn, mheim_verweigert, maz_gesamt	lpp_employee	proportion of hours worked from home in an establishment to the total working hours of that establishment
country of birth: Germany (Deutschland)	mgebdeutsch	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual is born in Germany • 0, otherwise
age (Alter)	mgebjahr	lpp_employee	the age of the individual (in years)
number of children (Kinder)	mkind_anz, mhhgroesse, mpartner_hh	lpp_employee	the number of children under 14 years that live within the household
partner (partner)	mpartner, mpartner_hh	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual has a partner • 0, otherwise
extraversion (Extraversion)	mbig_komm, mbig_gesell, mbig_zur	lpp_employee	measure of the Big Five personality characteristic extraversion on a scale from 1 to 5
agreeableness (Verträglichkeit)	mbig_grob, mbig_verzeih, mbig_freundl	lpp_employee	measure of the Big Five personality characteristic agreeableness on a scale from 1 to 5
conscientiousness (Gewissenhaftigkeit)	mbig_gruend, mbig_faul, mbig_effi	lpp_employee	measure of the Big Five personality characteristic conscientiousness on a scale from 1 to 5
neuroticism (Neurotizismus)	mbig_sorgen, mbig_nervoes, mbig_entsp	lpp_employee	measure of the Big Five personality characteristic neuroticism on a scale from 1 to 5

⁷ This table is not part of the paper submitted to the *European Management Journal*.

2 The leadership gap between full-time and part-time female employees

Variable name (label Do-File)	Original variable(s)	Dataset(s)	Description
openness (<i>Offenheit</i>)	mbig_origi, mbig_kunst, mbig_phant, mbig_wissb	lpp_employee	measure of the Big Five personality characteristic openness on a scale from 1 to 5
vigor (<i>vigour</i>)	menga_energie, menga_fit, menga_freude	lpp_employee	measure of vigor as an aspect of work engagement on a scale from 1 to 5
dedication (<i>dedication</i>)	menga_begeist, menga_insp, menga_stolz	lpp_employee	measure of dedication as an aspect of work engagement on a scale from 1 to 5
absorption (<i>absorption</i>)	menga_glueck, menga_aufgeh, menga_mitreiss	lpp_employee	measure of absorption as an aspect of work engagement on a scale from 1 to 5
risk-seeking (<i>risikofreudig</i>)	mrisiko	lpp_employee	measure of risk-taking on a scale from 0 to 10 (with 0 meaning “risk averse” and 10 meaning “fully prepared to take risks”)
commitment (<i>commitment</i>)	mcom_rest, mcom_bedeut, mcom_identif, mcom_zugehoer, mcom_emo, mcom_teil	lpp_employee	measure of commitment of an employee toward his organization on a scale from 0 to 30
training at the workplace (<i>Training</i>)	mwb	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual has participated in any courses of further vocational training in the last two years • 0, otherwise
educational level (<i>Ausbildung</i>)	mausb	lpp_employee	
apprenticeship (<i>Lehre</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is an apprenticeship • 0, otherwise
training college (<i>Beruflich_schulisch</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a training college • 0, otherwise
technical college (<i>Fachschule</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a technical college • 0, otherwise
university degree (<i>Fach_Hochschulabschluss</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a university degree • 0, otherwise

2 The leadership gap between full-time and part-time female employees

Variable name (label Do-File)	Original variable(s)	Dataset(s)	Description
occupational position (<i>berufliche_Stellung</i>)	mstib, mstib_diff	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual is an unskilled or semi-skilled worker • 2, if the individual is a skilled worker or a foreman/forewoman • 3, if the individual is a white-collar worker
overtime hours _{t-1} (<i>Überstunden t1</i>)	maz_gesamt, maz_vertrag	lpp_employee	the difference between the total working hours and the contractual working hours of an employee in t-1 (in hours)
working from home _{t-1} (<i>homeoffice_t1</i>)	mheim, mheimnein_unm, mheimnein_tech, mheimnein_erl, bhomeoffn_tech, bhomeoffn_dat, bhomeoffn_taeftig	lpp_employee lpp_employer	<ul style="list-style-type: none"> • 0, if an individual is not working from home in t-1 • 1, if an individual is working from home in t-1 • 2, if for an individual working from home is not possible or not allowed in t-1
establishment size (<i>Betriebsgröße_kategorial</i>)	t30ges, v25ges, x26ges, z27ges	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if the establishment has 1–249 employees (small and medium-sized enterprises) • 2, if the establishment has 250 and more employees (large enterprises)
establishment's supervisor-to-staff ratio (<i>Anteil FK MA</i>)	t59a, v70a, x75a, z54a, t30ges, v25ges, x26ges, z27ges	IAB Establishment Panel	proportion of supervisors on the first hierarchy level to the total number of employees of an establishment
development plans (<i>Entwicklungsplaene</i>)	bentwplan	lpp_employer	<ul style="list-style-type: none"> • 1, if development plans for employees in the establishment exist • 0, otherwise
appraisal interviews (<i>MAGespraeche</i>)	bimagespr	lpp_employer	<ul style="list-style-type: none"> • 1, if the establishment conducts structured appraisal interviews at least once a year • 0, otherwise
flexible working hours (<i>MABindung_faz</i>)	bmabind_flexaz	lpp_employer	rating by the employer toward the importance of flexible working hours to strengthen employee loyalty to the establishment on a scale from 1 to 5 (with 1 meaning “unimportant” and 5 meaning “very important”)

2 The leadership gap between full-time and part-time female employees

Variable name (label Do-File)	Original variable(s)	Dataset(s)	Description
establishment's proportion of females (<i>Anteil Frauen</i>)	t30ges_f, v25ges_f, x26ges_f, z27ges_f, t30ges, v25ges, x26ges, z27ges	IAB Establishment Panel	proportion of female employees to the total number of employees of an establishment
promotion based on professional expertise (<i>bef_fachkompetenz</i>)	bbfoerd_fachkomp, bbfoerd_fachkomp_v1	lpp_employer	<ul style="list-style-type: none"> • 1, if professional competence is an important criterion for promotions • 0, otherwise
promotion based on personal competence (<i>bef_perskompetenz</i>)	bbfoerd_perskomp, bbfoerd_perskomp_v1	lpp_employer	<ul style="list-style-type: none"> • 1, if personal skills such as communication, presentation, self-management competence are an important criterion for promotions • 0, otherwise
survey wave (<i>jahr</i>)	YEAR	IAB Establishment Panel	<ul style="list-style-type: none"> • 2014: wave 2 (2014/2015) • 2016: wave 3 (2016/2017) • 2018: wave 4 (2018/2019)
state (<i>Bundesland</i>)	bula2012, bula2014, bula2016, bula2018	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if state is Schleswig-Holstein • 2, if state is Hamburg • 3, if state is Lower Saxony • 4, if state is Bremen • 5, if state is North Rhine-Westphalia • 6, if state is Hesse • 7, if state is Rhineland-Palatinate • 8, if state is Baden-Württemberg • 9, if state is Bavaria • 10, if state is Saarland • 11, if state is Berlin • 12, if state is Brandenburg • 13, if state is Mecklenburg Western Pomerania • 14, if state is Saxony • 15, if state is Saxony-Anhalt • 16, if state is Thuringia
industry (<i>Branche15</i>)	t89b, v89b, x89b, z91b	IAB Establishment Panel	<ul style="list-style-type: none"> • 2, if industry is mining and quarrying

2 The leadership gap between full-time and part-time female employees

Variable name (label Do-File)	Original variable(s)	Dataset(s)	Description
			<ul style="list-style-type: none"> • 3, if industry is electricity, gas and water supply, water and scrap, disposal, recycling • 4, if industry is manufacturing • 5, if industry is construction • 6, if industry is trade • 7, if industry is transport and storage • 8, if industry is information, communication • 9, if industry is accommodation and food services • 10, if industry is financial and insurance services • 11, if industry is business support, scientific and other professional services • 12, if industry is education • 13, if industry is human health and social work • 14, if industry is other services • 15, if industry is non-profit organizations, public administration
pers_id (pers_id)	persnr	lpp_employee	unique individual identification number
lpp_betnr (lpp_betnr)	betnr	lpp_employee, lpp_employer, IAB Establishment Panel	unique establishment identification number

Does being a leader make them stay? Short- and long-term effects of supervisory responsibility on turnover intentions

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- the 17th International (Post-)Doctoral-Workshop “Personnel, Education, and Organizational Economics“ 2022 in Riederau, Germany,
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Abstract: Employers want to avoid fluctuation, especially when qualified personnel is involved. This raises the question of whether promoting employees into leadership positions with supervisory responsibility helps to retain them. Based on social exchange theory, this article predicts that in the short run, employees have lower turnover intentions due to reciprocal feelings. In the long run, following human capital theory, supervisory responsibility increases an employee’s turnover intentions due to the general skills acquired in the leadership position. This article argues that human resource management practices that enhance an individual’s internal career development counteract this long-term turnover-increasing effect by offering employees internal advancement opportunities. This study empirically tests these predictions using German linked employer-employee data. The results support the predicted short-term turnover-reducing and the long-term turnover-increasing effect of supervisory responsibility. The results also reveal that for long-term supervisors appraisal interviews and development plans, two examples of human resource management practices, counteract the effect by reducing an employee’s intention to quit.

Keywords: supervisory responsibility, turnover intentions, leadership, retention, human resource management practices

⁸ The data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access.

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3.1 Introduction

Fluctuation is costly and employers, therefore, strive to avoid it. Productivity losses, an increased administrative burden, a loss of social capital and tacit knowledge as well as turnover being contagious all cause the price of fluctuation to be high (D. J. Chung et al., 2022; Mohr et al., 2012; Rubenstein et al., 2018). In an economic sense, the financial burden of turnover is staggering, often ranging from 90% to 200% of an employee's annual salary (Allen et al., 2010). Consequently, employers have an incentive to minimize employee turnover, particularly when it concerns highly skilled and qualified personnel. Especially in times of skills and managerial shortage, it is indispensable to retain highly talented employees.

One possibility to retain qualified employees is to promote them, e.g. into a leadership position with supervisory responsibility. This promotion closely relates to the phenomenon of the employability paradox which has been widely discussed in the literature and revolves around the question of whether development activities that enhance employees' ability also increase the risk of employee turnover (Nelissen et al., 2017). In line with this, this study seeks to address whether promoting employees into a leadership position with supervisory responsibility helps to retain them or whether this promotion increases the risk of turnover because of increased marketable skills. Since turnover intentions are verified to be a direct antecedent of actual turnover and, therefore, represent one of its best predictors (Steel and Ovalle, 1984), this study will, in the following, rely on turnover intentions as the central phenomenon.

For the theoretical framework, this article integrates perspectives from social exchange and human capital theory by explicitly acknowledging that the underlying theoretical mechanism of the relationship between supervisory responsibility and turnover intentions differs in the short and the long run. This advances the literature on social exchange and human capital theory by differentiating the short- and long-term aspects of the relationship between supervisory responsibility and turnover intentions. When considering the short-term effect of supervisory responsibility on turnover intentions, this study draws upon social exchange theory. This perspective posits that obtaining supervisory responsibility evokes reciprocal feelings in employees, thereby reducing intentions to leave the current employer. In contrast, the exploration of the long-term effect of supervisory responsibility aligns with human capital theory. In line with this theory, individuals occupying leadership positions with supervisory

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responsibility over an extended period tend to accumulate general skills. This heightened general human capital, in turn, enhances their attractiveness to external career prospects, increasing their long-term turnover intentions. For an employer, this imposes the question of how to address this long-term turnover-increasing effect. This article argues that human resource management (HRM) practices that enhance an employee's internal career development counteract this long-term turnover-increasing effect by offering employees more internal options for advancement. These advancement opportunities, provided by appraisal interviews and development plans, make the internal labor market more attractive to the employee in comparison to the outside one which leads to lower intentions to leave the employer.

This article offers contributions to the existing literature in two key areas. First, it addresses the ongoing debate concerning the explanation of turnover intentions by social exchange versus human capital theory. While a large strand of literature stresses that human capital theory explains the relationship between employee development activities and turnover intentions (Benson, 2006; Benson et al., 2004; D. Dietz and Zwick, 2021; Green et al., 2000; Manchester, 2012; Pattie et al., 2006; Sieben, 2007; Trevor, 2001), another strand of literature has investigated this relation from a social exchange perspective (Dysvik and Kuvaas, 2008; Ertas, 2019; C. H. Lee and Bruvold, 2003). Although some papers use both theoretical concepts when investigating training (Kampkötter and Marggraf, 2015; Koster et al., 2011) or employee development (Martini et al., 2023; Rahman and Nas, 2013), none of these scholars has systematically differentiated the relationship with turnover intentions from a short- and long-term perspective. When considering a leadership position, previous research has yielded mixed results when empirically controlling for supervisory responsibility (Elvira and Cohen, 2001; Manchester, 2012), the employment position level (Baranchenko et al., 2020), or satisfaction with the level of responsibility (Ertas, 2019) in the context of turnover intentions. This variability in findings implies that the effect might not be constant over time and underscores the importance of considering short- and long-term effects separately. This article extends the existing research by placing a specific focus on the influence of supervisory responsibility, explicitly differentiating between its short- and long-term effects on turnover intentions. Given the practical significance of understanding both short- and long-term turnover effects for organizations, this study provides valuable insights into this nuanced issue.

Second, although existing literature has underscored the importance of career-supporting HRM practices to lower turnover intentions (Ertas, 2019; Kraimer et al., 2011; Shuck et al.,

2014), especially among employees with career aspirations, it has not been investigated if internal career development practices can act as a retention device for supervisors. Consequently, I address this void by identifying two HRM practices that enhance internal career development, namely appraisal interviews and development plans, as potential instruments for employers to mitigate the turnover intentions of long-term supervisors.

3.2 Literature and theoretical background

In the literature, the two most prominent theories to explain the relationship between training or development opportunities and turnover (intentions) are the social exchange and the human capital theory. On the one side, there is a vast amount of research that asserts the effect of actual training, employee development practices, and skills acquisition on turnover intentions from a human capital perspective (Benson, 2006; Benson et al., 2004; D. Dietz and Zwick, 2021; Green et al., 2000; Manchester, 2012; Pattie et al., 2006; Sieben, 2007; Trevor, 2001). This literature claims that, in the light of human capital theory, individuals' acquiring skills and knowledge through training increases their marketable skills and external job opportunities. The transferability of these general skills will enhance employability and the likelihood that employees will market their skills elsewhere. On the other side, there is a large strand of literature following social exchange theory that rather focuses on the employee's perception of training and development opportunities instead of the actual skills acquisition itself (Dysvik and Kuvaas, 2008; Ertas, 2019; C. H. Lee and Bruvold, 2003). Social exchange theory emphasizes the notion that relationships between individuals and organizations are based on reciprocity and mutual benefits. Thus, the perception of training or development opportunities induces feelings of reciprocity which reduces employees' turnover intentions. Even though a couple of scholars base their argumentation on both central theories (Kampkötter and Marggraf, 2015; Koster et al., 2011; Martini et al., 2023; Rahman and Nas, 2013), they do not consider differences between the short- and long-term effect of supervisory responsibility and turnover intentions. By specifically distinguishing between short- and long-term supervisory responsibility and turnover intentions, I shed more light on the application of social exchange and human capital theory.

3.2.1 The short-term effect of supervisory responsibility

The argumentation for the short-term negative effect of obtaining supervisory responsibility on an employee's intention to leave the current employer is based on social exchange theory. Following Homans (1958, 1961), any kind of human behavior is based on social exchange. The

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concept of social exchange, which is defined as the “exchange of activity, tangible or intangible, and more or less rewarding or costly, between at least two persons” (Homans, 1961, p. 13), incorporates that exchange relations are based on trust and reciprocity. Thus, it induces feelings of personal obligation, trust, and gratitude (Blau, 1964, p. 94). Generally, the higher the value of the activity a member of the exchange relationship receives, the more value they must give back to restore the social equilibrium (Homans, 1958). Following Maurer et al. (2002, p. 438), development opportunities, especially those transferring general skills (Kampkötter and Marggraf, 2015, p. 2891), oblige to reciprocal behavior. Therefore, I argue that if an employer transfers supervisory responsibility to an employee this can be seen as a development opportunity entailing general skills causing the individual to feel valued and important to their employer (Kampkötter and Marggraf, 2015, 2891, 2900). As a consequence, the respective employee intends to restore the social equilibrium through higher efforts and greater affective commitment (Eisenberger et al., 2001, p. 42). Since the reciprocal reaction only occurs immediately after the advantageous treatment by the employer (Kampkötter and Marggraf, 2015, p. 2891), this results in temporarily lowered turnover intentions. Basing my argumentation on the social exchange mechanism, I put forward the following hypothesis:

Hypothesis 1: If an individual obtains supervisory responsibility, it temporarily lowers their turnover intentions compared to an individual without supervisory responsibility.

3.2.2 The long-term effect of supervisory responsibility

As argued above, the employee behaves reciprocally only immediately after obtaining supervisory responsibility until the social equilibrium is restored. Thus, the long-term effect of supervisory responsibility on turnover intentions can be argued from a human capital perspective. Standard human capital theory (Becker, 1962) posits that general human capital increases an individual’s productivity in multiple firms in addition to the one providing it leading to a higher labor market value of the employee. In consequence, the transferability of general skills increases an employee’s outside options and makes them more attractive to other firms (Benson et al., 2004; Manchester, 2012). These outside options can outbid the employer that provided the general skills due to not having to compensate for these human capital investments (D. Dietz and Zwick, 2021, p. 711), which leads to higher turnover intentions. Additionally, Schneider and Flore (2019) show that when individuals are employed over a longer period, general skills negatively affect an employee’s calculative and normative commitment because the employee might interpret the general skills as a signal of job insecurity.

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Given that the skills obtained from having supervisory responsibility are of general nature (Kampkötter and Marggraf, 2015, p. 2900), holding a leadership position with supervisory responsibility can be seen as an investment in general human capital. Although it takes some time for an individual in a leadership position with supervisory responsibility to acquire these general skills, they are eventually acquired. Consequently, in the long run, an individual who holds such a position acquires more general human capital than one who does not hold such a position. While the acquisition of these skills occurs in the early stages of being a leader, the application, utilization, and development of these skills are related to stages later on in the trajectory of being in a leadership position (Mumford, Marks, et al., 2000, pp. 88–90). While previous research does not ensure an exact timeframe of when these skills are acquired, I base my arguments on the notion that leadership development programs show effects of supervisors acquiring leadership skills within the first year after the leadership training (Abrell et al., 2011) and the fact that leadership development programs tend to last around one year (Hirst et al., 2004; Karagianni and Jude Montgomery, 2018). Nevertheless, and irrespective of the quality or the utilization of these skills, the mere possession of these general skills enhances an individual's employability in the labor market, as argued above. To conclude, the higher employability and the greater outside options of those with supervisory responsibility, i.e. more general human capital increase an employee's intentions to leave their current employer. This leads to the following hypothesis:

Hypothesis 2: If an individual obtains supervisory responsibility, it increases their turnover intentions in the long run compared to an individual without supervisory responsibility.

3.2.3 Human resource management practices that enhance internal career development

In the long run, as argued above, supervisory responsibility positively impacts an employee's turnover intentions. Generally, the employer wants to counteract sentiments that increase the intent to leave the current employer (Firth et al., 2004). In the next step, I, therefore, scrutinize factors that reduce the turnover intentions of long-term supervisors. I assert that, for long-term supervisors, HRM practices that foster their internal career development reduce their turnover intentions. Following the literature that states that an employee's turnover intentions can be reduced by illustrating internal career advancement opportunities (Ertas, 2019; Kraimer et al., 2011; Shuck et al., 2014) and in line with the above arguments on human capital theory, the employer could counteract the effect of supervisory responsibility as a form of general human capital leading to better outside options by offering the employee better internal options. I argue this being especially relevant for qualified personnel, e.g., employees with long-term

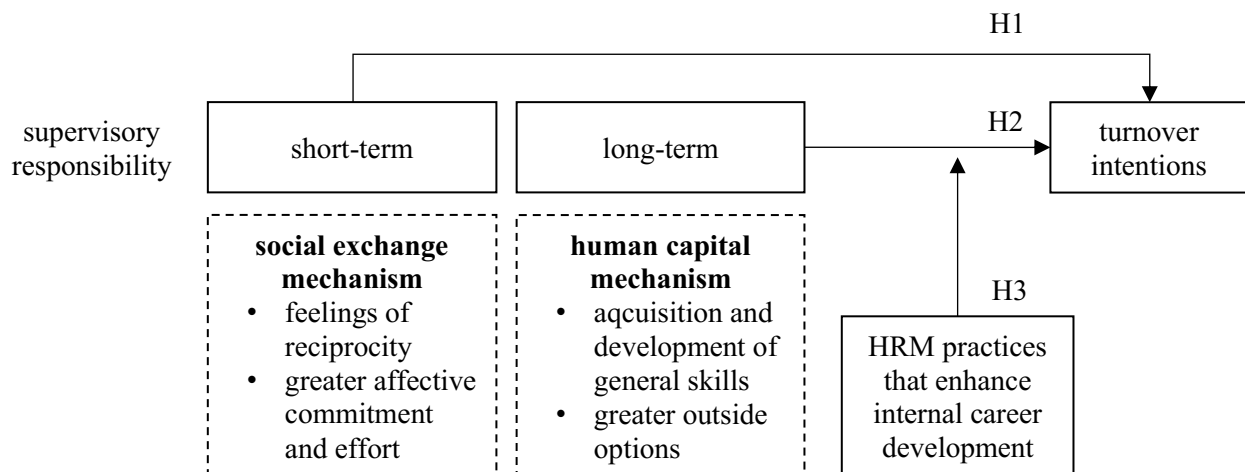
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supervisory responsibility because they have a special interest in career advancement. The better internal options due to HRM practices would, in consequence, lower the intent of an employee with long-term supervisory responsibility to leave their current employer. Consequently, I hypothesize the following:

Hypothesis 3: If an individual with long-term supervisory responsibility is offered HRM practices that enhance their internal career development, their turnover intentions decrease compared to an individual without such practices.

As shown in Figure 1, the theorizing of this article links the short- and long-term perspective of supervisory responsibility and turnover intentions. In the conceptual model, I argue that it is through the social exchange mechanism that short-term supervisors have lowered turnover intentions and through the human capital mechanism that long-term supervisors have increased turnover intentions.

Figure 1: Conceptual model of the relationship between supervisory responsibility and turnover intentions



3.3 Data and methodology

3.3.1 Sample

To test the hypotheses, this study uses data from the Linked Personnel Panel (LPP) which is a German linked employer-employee panel data set provided by the Research Data Center of the German Federal Employment Agency at the Institute for Employment Research (IAB) (Mackeben et al., 2023). I combine the data of the LPP with the administrative data from the Integrated Employment Biographies (IEB) to obtain highly reliable information on an individual's employment history, more precisely information on an individual's tenure with their current employer. The IEB are sourced by the German Employment Agency and comprise

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individual-level administrative data from, among other sources, annual reports of employers to social security authorities. Since the LPP employer survey is a follow-up questionnaire of the IAB Establishment Panel, I can additionally link the data to the IAB Establishment Panel to acquire more information on the establishment level (e.g., industry indicators). The LPP consists of 4 waves that were conducted in the years 2012/2013, 2014/2015, 2016/2017, 2018/2019. The dataset is representative of German private sector establishments with 50 or more employees liable to social security and entails information on employees' personal attitudes, socio-demographics, and working conditions at the employee level and information on HRM instruments, corporate culture, and structural features at the establishment level (Ruf, Mackeben, Grunau, and Wolter, 2020). The major benefits of the dataset are that it contains detailed information on the employees' attitudes towards work (e.g., job satisfaction), which are highly relevant to explain turnover intentions (Trevor, 2001), and that the information on employees and their employers can be linked. This is necessary for making statements about the effects of HRM practices on the turnover intentions of long-term supervisors.

Since information on the main variables was not observed in the first wave, I only use waves 2 to 4 for the empirical analyses. Moreover, for the empirical analyses, I also exclude individuals that are older than 67 due to the statutory retirement age in Germany and I restrict the sample to individuals working for the same employer in at least two waves because it is only plausible to analyze turnover intentions for individuals that are still working for the same employer. To address the research question of this study correctly, it is crucial to ensure that individuals are still with the employer from whom they obtained supervisory responsibility. This does not mean excluding individuals with previous supervisory responsibility experience per se but instead, ensuring that individuals being considered are still employed by the same employer that granted them supervisory responsibility. This assures that the results are not confounded by the long-term effects of supervisory responsibility from previous workplaces because it becomes challenging to isolate the mechanism, as there could be additional unobservable influences from the possibility of changing employers or unknown reasons for the employment transitions which can impact turnover intentions. As a result, I eliminate all individuals who obtained supervisory responsibility with a different employer than the one where they are working when observed within this study. Thus, the final sample consists of 4,351 observations from 1,924 individuals working for 458 employers. Within this final sample, each individual included is observed for a minimum of two and a maximum of three observation points.

3.3.2 Variables

Main variables

In the analyses, *turnover intention* is the dependent variable and is captured by the question “How many times in the past 12 months have you thought about changing your job?”. The answers ranged from “daily” to “never” on a five-point Likert scale. Since the distribution of this variable is strongly-right-skewed⁹, I recoded the dependent variable *turnover intentions* into three categories low, moderate, and high turnover intentions (low=“never”, moderate=“a few times a year”, high=“a few times a month”, “a few times a week”, “daily”)¹⁰. Additionally, I claim that the difference between thinking about leaving your current employer “a few times a year” and “a few times a month” is notably bigger than the difference between “a few times a month” and “a few times a week”. Furthermore, I only consider the question regarding professional (and not private) reasons for turnover intention in the analyses. This is done to ensure that the dependent variable captures only the work-related turnover effect because personal turnover intentions might be correlated to multiple other individual factors that cannot be observed in the data.

The short-term and long-term effects of supervisory responsibility were measured by using the question “For how many years have you been in charge of other persons regardless of your current position?” which is a follow-up question for individuals who claimed to supervise others. I operationalize the main independent variable *supervisory responsibility* into three categories following the operationalization of the training variable from Kampkötter and Marggraf (2015, p. 2895). The variable takes the value 1 if the individual does not have supervisory responsibility, 2 if the individual has obtained supervisory responsibility within the last year (short-term), and 3 if the individual has had supervisory responsibility for a year or longer (long-term). I group individuals with at least one year of experience in a leadership position with supervisory responsibility into one category, since I rely on the theoretical notion that after one year of occupying a leadership position with supervisory responsibility, an individual has acquired the skills associated with this position and, thus, to ensure that I am

⁹ “never”: 2,943, “a few times a year”: 950, “a few times a month”: 310, “a few times a week”: 118, “daily”: 30

¹⁰ A test of summarizing the categories of the dependent variable even more was rejected. Cronbach’s alpha is 0.7, indicating that the scale of the dependent variable is reliable.

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measuring the acquisition of general leadership skills and not the application and utilization of these skills.¹¹

For the second step of the empirical analysis, HRM practices that enhance an individual's career development are of interest. I quantify these by the two dummy variables *appraisal interview*, which takes the value 1 if the individual has had a structural appraisal interview during the last year and 0 otherwise (employee level), and *development plans*, which takes the value 1 if development plans for supervisors exist and are systematically reviewed at the respective establishment (establishment level).

Control variables

In addition to supervisory responsibility, a variety of other factors can influence an employee's likelihood of intending to leave their current employer. To account for these factors, this study draws on previous research on turnover and turnover intentions and includes a range of employee-level and establishment-level characteristics as control variables. On the employee level, these include whether an individual is *female* (Blomme et al., 2010) due to the differences between men and women in terms of career expectations. Specifically, women may face difficulties in obtaining leadership positions and may also have restricted opportunities to change employers due to family responsibilities, which are traditionally associated with women. In line with the aspect of family responsibilities and career advancement, I also control for the *number of children* under the age of 14 that live within the same household (T. W. Lee and Maurer, 1999). I further include an employee's *age* (Yuan, Kroon, & Kramer, 2022) since employees from different age groups may have varying employment preferences. Additionally, I include five dummy variables indicating an individual's *education level* (Chowdhury, 2015), since education is indicative of an individual's employability in the labor market. Finally, I consider the *Big Five personality characteristics* (Albrecht and Marty, 2017; Barrick and Zimmerman, 2009; Jeswani and Dave, 2012) as control variables, given their potential impact on both, the occupancy of leadership positions and turnover intentions.

Job-related factors on the employee level include an individual's level of *commitment* (Armstrong-Stassen and Schlosser, 2010; Brunetto et al., 2012) since committed employees are more attached and loyal to their organization, which makes them less likely to leave.

¹¹ While I acknowledge that previous studies do not ensure a one-year period for acquiring leadership skills, some studies (Abrell et al., 2011; Hirst et al., 2004; Karagianni and Jude Montgomery, 2018; Lord and Hall 2005) hint to or base their arguments on the idea that approximately after one year, a supervisor has typically completed a leadership development programme and/or acquired general management skills needed within that position.

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Table 11: Descriptive statistics of all variables in the analyses on supervisory responsibility and turnover intentions

	Mean	SD	Min	Max
Main variables				
turnover intention				
low turnover intentions	0.676	–	0	1
moderate turnover intentions	0.218	–	0	1
high turnover intentions	0.105	–	0	1
supervisory responsibility ^a				
no supervisory responsibility	0.737	–	0	1
supervisory responsibility < 1 year	0.004	–	0	1
supervisory responsibility ≥ 1 year	0.259	–	0	1
appraisal interviews	0.548	–	0	1
development plans	0.341	–	0	1
Employee characteristics				
female	0.276	–	0	1
age	50.15	9.277	20	67
number of children	0.338	0.705	0	4
education				
apprenticeship	0.473	–	0	1
training college	0.081	–	0	1
technical college	0.217	–	0	1
university degree	0.208	–	0	1
no/other education	0.020	–	0	1
extraversion	3.611	0.728	1.333	5
agreeableness	4.043	0.572	1.667	5
conscientiousness	4.354	0.459	2.333	5
neuroticism	2.717	0.769	1	5
openness	3.606	0.622	1.250	5
commitment	22.26	5.173	0	30
training	0.410	–	0	1
tenure	17.14	10.46	0	44
job satisfaction	7.503	1.609	0	10
fair treatment by the supervisor	3.922	0.910	1	5
perceived support	3.478	1.200	1	5
Establishment characteristics				
establishment size				
small enterprises (10–49)	0.011	–	0	1
medium-sized enterprises (50–249)	0.599	–	0	1
large enterprises (250 and more)	0.390	–	0	1

Notes: Descriptive statistics of individual level variables are based on 4,351 individual level observations from 1,924 employees, descriptive statistics of establishment characteristics are based on 458 establishments

^a The observations in each category are as follows: no supervisory responsibility (3,207), supervisory responsibility < 1 year (17), supervisory responsibility ≥ 1 year (1,127)

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

As supervisors may receive more training in the workplace than non-supervisors, the study also controls whether an individual has participated in *training at the workplace* in the last 12 months (Kampkötter and Marggraf, 2015). Together with training, *tenure* with the current employer (I. W. Lee and Lee, 2021) captures an individual's skills which impact employability.

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Furthermore, I include an individual's overall *job satisfaction* (Flickinger et al., 2016). Since a leadership position with supervisory responsibility can be seen as a development opportunity that is typically granted or influenced by an employee's supervisor, the study also controls for an individual's perception of *fair treatment by the supervisor* (Zhang et al., 2019), as well as for their *perceived support* (Koster et al., 2011). This is because the perception of fair treatment and organizational support can reinforce an employee's reciprocal behavior within the exchange relationship, resulting in reduced turnover intentions.

The control variables on the establishment level are the *establishment size* and 15 *industry* dummy variables to control for labor market differences within an establishment or an industry (Haines III et al., 2010), as well as the *state* in which the corporation is based to control for regional labor market disparities since individuals in a leadership position with supervisory responsibility may base their decisions on when to leave their current employer on the available job market opportunities within their firm, industry or region. Finally, I add a dummy variable for each survey wave to correct for time effects. Table 11 provides a summary of descriptive statistics for all variables included in the analyses. Table 12 displays correlations of the main variables.

Table 12: Correlation matrix of the main variables included in the analyses on supervisory responsibility and turnover intentions

	(1)	(2)	(3)	(4)
(1) turnover intention	1.000			
(2) supervisory responsibility	-0.057***	1.000		
(3) development plans	-0.028	-0.016	1.000	
(4) appraisal interviews	-0.075***	0.065***	0.210***	1.000

Notes: Descriptive statistics of individual level variables are based on 4,351 individual level observations from 1,924 employees, descriptive statistics of establishment characteristics are based on 458 establishments
Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

3.3.3 Estimation strategy

To take into account the ordinal scaling of the dependent variable *turnover intentions* (low, moderate, high) and the panel structure of the data, I apply a random-effects ordered probit model. The ordered probit model jointly estimates the probability that an employee falls into each of the three categories of turnover intentions given the values of the independent variables using maximum likelihood. Finally, since multiple individuals are drawn from the same employer, I account for correlations within establishments by clustering standard errors at the establishment level.

3.4 Results

3.4.1 Baseline results

To quantify the short-term and long-term effect of supervisory responsibility on turnover intentions, I examine the results of the ordered probit regression which are displayed in Table 13 (Model M1). Column 1 shows the regression coefficients whereas Columns 2 to 4 give deeper insights on the effect sizes by displaying average marginal effects for the different outcome categories of the dependent variable. Hypothesis 1 states that if an individual obtains supervisory responsibility, it temporarily lowers their turnover intentions compared to an individual without supervisory responsibility. The statistically significant and negative coefficient of *supervisory responsibility < 1 year* in Column 1 of Table 13 supports the theoretical prediction that in the short run supervisory responsibility lowers an employee's intentions to leave the current employer compared to an employee without supervisory responsibility. To evaluate the magnitude of the effect size, I examine average marginal effects: When an employee obtains supervisory responsibility, their probability of low turnover intentions, i.e. never thinking about changing their job increases on average by 15.4 percentage points. Conversely, the probability of high turnover intentions decreases by 4.7 percentage points when obtaining supervisory responsibility.

Looking at the results of the variable *supervisory responsibility ≥ 1 year* in Column 1 of Table 13, I find a statistically significant and positive coefficient. This supports hypothesis 2, which claims that obtaining supervisory responsibility has a long-term positive effect on an employee's turnover intentions compared to an individual without supervisory responsibility. The average marginal effects of having supervisory responsibilities for at least a year indicate that the probability for an individual to have low turnover intentions is on average 3.2 percentage points lower compared to employees without supervisory responsibilities (Column 2). Moreover, the probability for an individual to have high turnover intentions is on average 1.2 percentage points higher when comparing employees having supervisory responsibilities for a year or more to non-leaders. I, additionally, tested the short- and long-term effects of supervisory responsibility on turnover intentions to be statistically different from each other. This shows that employees who have had supervisory responsibility for a year or more also have higher turnover intentions than employees who have just shortly been promoted into a leadership position with supervisory responsibility. To sum up, the empirical findings support the theoretical predictions that obtaining a leadership position with supervisory responsibility temporarily lowers turnover intentions while increasing them in the long run.

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Table 13: Ordered probit estimation of turnover intentions

	coefficients		average marginal effects	
	M1	low turnover intentions	moderate turnover intentions	high turnover intentions
supervisory responsibility				
no supervisory responsibility	ref.	ref.	ref.	ref.
supervisory responsibility < 1 year	-0.989*** (0.365)	0.154*** (0.041)	-0.107*** (0.031)	-0.047*** (0.010)
supervisory responsibility ≥ 1 year	0.155* (0.080)	-0.032* (0.016)	0.020* (0.010)	0.012* (0.006)
appraisal interviews	-0.007 (0.079)	0.001 (0.016)	-0.001 (0.010)	-0.000 (0.006)
development plans	-0.047 (0.072)	0.010 (0.014)	-0.006 (0.009)	-0.003 (0.005)
Employee characteristics				
female	0.020 (0.079)	-0.004 (0.016)	0.002 (0.010)	0.001 (0.006)
age	-0.046*** (0.005)	0.009*** (0.001)	-0.006*** (0.001)	-0.003*** (0.000)
number of children	-0.044 (0.042)	0.009 (0.008)	-0.006 (0.005)	-0.003 (0.003)
education				
apprenticeship	ref.	ref.	ref.	ref.
training college	-0.075 (0.145)	0.015 (0.029)	-0.010 (0.018)	-0.005 (0.011)
technical college	0.125 (0.097)	-0.025 (0.019)	0.016 (0.012)	0.009 (0.007)
university degree	0.419*** (0.103)	-0.084*** (0.021)	0.053*** (0.013)	0.031*** (0.008)
no/other education	-0.053 (0.238)	0.011 (0.048)	-0.007 (0.030)	-0.004 (0.017)
extraversion	0.001 (0.054)	-0.000 (0.011)	0.000 (0.007)	0.000 (0.004)
agreeableness	-0.040 (0.066)	0.008 (0.013)	-0.005 (0.008)	-0.003 (0.005)
conscientiousness	-0.108 (0.085)	0.022 (0.017)	-0.014 (0.011)	-0.008 (0.006)
neuroticism	0.200*** (0.049)	-0.040*** (0.010)	0.025*** (0.006)	0.015*** (0.004)
openness	0.202*** (0.064)	-0.040*** (0.013)	0.026*** (0.008)	0.015*** (0.005)
commitment	-0.081*** (0.008)	0.016*** (0.002)	-0.010*** (0.001)	-0.006*** (0.001)
training	0.129* (0.068)	-0.026* (0.013)	0.016* (0.009)	0.009* (0.005)

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	coefficients		average marginal effects	
	M1	low turnover intentions	moderate turnover intentions	high turnover intentions
tenure	-0.012*** (0.004)	0.002*** (0.001)	-0.002*** (0.001)	-0.001*** (0.000)
job satisfaction	-0.342*** (0.027)	0.069*** (0.005)	-0.044*** (0.003)	-0.025*** (0.002)
fair treatment by the supervisor	-0.308*** (0.040)	0.062*** (0.008)	-0.039*** (0.005)	-0.023*** (0.003)
perceived support	-0.151*** (0.030)	0.030*** (0.006)	-0.019*** (0.004)	-0.011*** (0.002)
Establishment characteristics				
establishment size				
small enterprises (10–49)	ref.	ref.	ref.	ref.
medium-sized enterprises (50–249)	0.604*** (0.173)	-0.130*** (0.040)	0.078*** (0.022)	0.052*** (0.018)
large enterprises (250 and more)	0.293*** (0.097)	-0.060*** (0.020)	0.038*** (0.013)	0.022*** (0.008)
cut point 1	-6.735*** (0.562)			
cut point 2	-5.141*** (0.547)			
number of observations	4,351	4,351	4,351	4,351
number of individuals	1,924	1,924	1,924	1,924
number of establishments	458	458	458	458
log pseudo-likelihood	-2,594.555			

Notes: Dependent variable: turnover intention; dummy variables for year, state and industry included; standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

To counteract this long-term turnover-increasing effect, I have argued that HRM practices that enhance internal career development can oppose this effect by lowering the turnover intentions of long-term supervisors (H3). Therefore, in a second step, I restrict the sample to only individuals with supervisory responsibility and I include an interaction term between supervisory responsibility and appraisal interviews (Table 14, Model M2), respectively development plans (Table 14, Model M3), as proxies of HRM practices that enhance internal career development, into the regression.

To interpret the results of the interaction terms, I further calculate average marginal effects which are displayed in Table 15. In line with the theoretical expectations, the results show that whether an employee with long-term supervisory responsibility has had a structural appraisal interview during the last year increases the probability of having low turnover intentions by 5.9 percentage points and decreases the probability of high turnover intentions by 1.8

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percentage points. In addition, development plans for supervisors increase the probability of low turnover intentions by 3.8 percentage points and decrease the chance of high turnover intentions by 1.1 percentage points. Altogether, this supports hypothesis 3. As expected, for short-term supervisors, the average marginal effects of both HRM practices are not statistically significantly different from zero. This indicates that these particular HRM practices are only effective for long-term supervisors.

In conclusion, HRM practices that enhance internal career development can increase the retention of individuals with long-term supervisory responsibilities by lowering long-term supervisors' turnover intentions.

Table 14: Ordered probit estimation of turnover intentions for supervisors considering HRM practices moderations

	coefficients	
	M2	M3
supervisory responsibility		
supervisory responsibility < 1 year	ref.	ref.
supervisory responsibility ≥ 1 year	1.449*	0.630
	(0.773)	(0.527)
appraisal interviews	0.303	-0.316**
	(0.891)	(0.150)
appraisal interviews x supervisory responsibility ≥ 1 year	-0.620	
	(0.907)	
development plans	-0.218*	-1.172
	(0.126)	(0.823)
development plans x supervisory responsibility ≥ 1 year		0.964
		(0.831)
cut point 1	-7.273***	-8.046***
	(1.429)	(1.288)
cut point 2	-5.508***	-6.284***
	(1.384)	(1.240)
employee characteristics	yes	yes
establishment characteristics	yes	yes
number of observations	1,144	1,144
number of individuals	629	629
number of establishments	284	284
log pseudo-likelihood	-603.158	-602.865

Notes: Dependent variable: turnover intention; employee and establishment characteristics as in Model M1 (Table 13); standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

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Table 15: Average marginal effects of career-enhancing HRM practices on turnover intentions for supervisors

average marginal effect of...	low turnover intentions	moderate turnover intentions	high turnover intentions
...appraisal interviews			
supervisory responsibility < 1 year	-0.029 (0.081)	0.023 (0.065)	0.006 (0.016)
supervisory responsibility ≥ 1 year	0.059** (0.029)	-0.041** (0.020)	-0.018** (0.009)
...development plans			
supervisory responsibility < 1 year	0.111 (0.081)	-0.088 (0.062)	-0.024 (0.019)
supervisory responsibility ≥ 1 year	0.038* (0.023)	-0.026* (0.016)	-0.011* (0.007)

Notes: Dependent variable: turnover intention; calculations based on Model M2 (Table 14) for appraisal interviews and Model M3 (Table 14) for development plans; standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

3.4.2 Robustness checks

The following supplemental analyses show the validity of the empirical results regarding two different model specifications. For brevity, Table 16 only presents the results relating to the main variables. The results relating to control variables accord with those from the main model and can be obtained from the author on request. First, since an approximate likelihood ratio test implies that the parallel regression assumption of the ordered probit model is rejected, I reestimate the analyses using a linear random effects probability model which does not rely on this assumption (Table 16, Models R1, R2, R3). Briefly, the results are robust concerning the significance and the sign of the main variables.

Second, in the data set of this study employees are nested within establishments and the estimations are therefore based on hierarchically structured data. Following Steenbergen and Jones (2002, pp. 219–220), a multilevel model is more appropriate in this case since it calculates inferences more precisely by explicitly acknowledging that observations are more similar within establishments than between them and, therefore, taking into account information from all levels when explaining the variance of the dependent variable (Steenbergen and Jones, 2002, p. 219). The results of the random-intercept multilevel ordered probit models (Models R4, R5, R6), which are displayed in Table 16, confirm the effects of the main analyses and, therefore, strengthen the results of this study. In conclusion, the results appear to be robust concerning the specifications of the model.

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Table 16: Robustness checks for the analyses on supervisory responsibility and turnover intentions

	linear random effects			multilevel ordered probit		
	R1	R2	R3	R4	R5	R6
supervisory responsibility						
no supervisory responsibility	ref.			ref.		
supervisory responsibility < 1 year	-0.304** (0.123)	ref.	ref.	-0.992*** (0.357)	ref.	ref.
supervisory responsibility ≥ 1 year	0.041* (0.022)	0.564** (0.236)	0.284 (0.186)	0.143* (0.078)	1.449* (0.773)	0.630 (0.527)
appraisal interviews	0.007 (0.020)	0.281 (0.270)	-0.085** (0.037)	-0.018 (0.078)	0.303 (0.891)	-0.316** (0.151)
appraisal interviews x supervisory responsibility ≥ 1 year		-0.372 (0.271)			-0.621 (0.907)	
development plans	-0.010 (0.018)	-0.050 (0.033)	-0.054 (0.240)	-0.084 (0.067)	-0.218* (0.126)	-1.172 (0.823)
development plans x supervisory responsibility ≥ 1 year			0.004 (0.241)			0.964 (0.831)
employee characteristics	yes	yes	yes	yes	yes	yes
establishment characteristics	yes	yes	yes	yes	yes	yes
number of observations	4,351	1,144	1,144	4,351	1,144	1,144
number of individuals	1,924	629	629	1,924	629	629
number of establishments	458	284	284	458	284	284
R ² (linear model)/ log pseudo-likelihood (multilevel model)	0.362	0.386	0.386	-2,583.089	-603.156	-602.862

Notes: Dependent variable: turnover intention; employee and establishment characteristics as in Model M1 (Table 13); standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

3.5 Discussion and conclusion

The results of the present research extend the findings of the social exchange literature on the relation between employee development and turnover intentions (Dysvik and Kuvaas, 2008; Ertas, 2019; C. H. Lee and Bruvold, 2003) and the literature which addresses this relationship from a human capital perspective (Benson, 2006; Benson et al., 2004; D. Dietz and Zwick, 2021; Green et al., 2000; Pattie et al., 2006; Sieben, 2007). It provides suggestive support for the application of social exchange and human capital theory by examining the impact of supervisory responsibility on an employee's turnover intentions, distinguishing between short-term and long-term effects. This approach offers a perspective to possibly deconstruct the theoretical constructs of social exchange and human capital theory into short- and long-term effects.

Using German linked employer-employee data, the current research provides insights into the prediction of social exchange theory that obtaining supervisory responsibility increases an employee's intention to stay with the current employer for a short period. Additionally, the results support the theoretical prediction of human capital theory that in the long run supervisory responsibility increases the intentions to leave the current employer as a consequence of the general skills acquired in the leadership position. Since turnover intentions decrease not only from having short-term compared to long-term supervisory responsibility (which could be explained due to the diminishing reciprocal feelings) but also by comparing individuals having supervisory responsibility on a long-term basis to employees without supervisory responsibility, explicitly tests the human capital mechanism.

The findings of this study also illustrate that HRM practices that enhance internal career development, like appraisal interviews or development plans, oppose this effect for long-term supervisors and reduce their intentions to leave the current employer since they then see more options for internal career progression and, therefore, internal utilization of their newly acquired general human capital. Conversely, these HRM practices do not affect the turnover intentions of short-term supervisors and should, therefore, be targeted at long-term supervisors only. Additionally, it reinforces the importance of career-supporting HRM practices whose relevance has already been stressed by previous literature (Ertas, 2019; Kraimer et al., 2011; Shuck et al., 2014) and extends it by specifically showing how these HRM practices reduce turnover intentions of long-term supervisors. Thus, it contributes to the literature by investigating how appraisal interviews and development plans can lower these increased turnover intentions of

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employees who have, through having long-term supervisory responsibility, acquired marketable skills.

The present findings are economically relevant and have several practical implications. For employers, handing over supervisory responsibility to an employee can be used as a short-term retention device. This might be particularly useful for employers that try to retain qualified personnel. Nevertheless, it needs to be noted that on a long-term basis solely promoting an employee into a leadership position with supervisory responsibility even increases their turnover intentions. Therefore, employers need to explicitly counteract this turnover-increasing effect when wanting to retain these managerial skills for a long period. As the results suggest, employers should combine transferring supervisory responsibility and, thus, giving employees broadly marketable skills with career development opportunities to retain qualified personnel. Since employers cannot develop every employee who gains new general skills, they should explicitly aim to retain high-performers (Benson, 2006, p. 186). For employees, the skills acquired through a leadership position with supervisory responsibility are of high market value and, therefore, desirable. If an employee is not offered additional internal career opportunities, they might use the acquired skills to pursue better outside options. Briefly, since obtaining supervisory responsibility is a development opportunity per se, additional development opportunities have to follow or employees will leave.

Although this research makes several contributions to the literature, it is nevertheless limited. First, the utilization of appraisal interviews and development plans as proxies for HRM practices that enhance internal career development might have some shortcomings. It is not clear how well they represent the chances of internal career development but they were the best options due to data availability. Future research could attempt to determine additional career-supporting HRM practices that counteract the long-term turnover-increasing effect of supervisory responsibility e.g. talent management programs. Another potential concern of this study is that even though the analyses include copious control variables in conformance with the literature on the individual and the establishment level to rule out an omitted variable bias as well as a selection problem, the coefficients should be interpreted with caution to causality since endogeneity cannot be fully precluded from the analyses. Second, I acknowledge that the present study focuses on turnover intentions instead of actual turnover due to data restrictions. Even though, the two constructs are said to be highly correlated, further research could compare the findings of this study to actual turnover behavior over a longer period. Furthermore, the limited number of observations with less than one year of supervisory responsibility

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(17 observations) may appear to present a challenge in the statistical analyses. This rare occurrence in the independent variable results in heightened uncertainty in estimating the point estimate of short-term supervisory responsibility. Nevertheless, given the substantial effect observed in this study, this degree of statistical uncertainty does not appear to be a significant concern. However, future studies could consider incorporating data that deliberately oversamples individuals having supervisory responsibility for a very short period. Additionally, the underlying social exchange mechanism of the short-term effect remains speculative at this time. I encourage future research to quantify this mechanism, especially considering the differences in the magnitude of reciprocal behavior between employees that were neglected in this study. Future work should attempt to determine differences in the amount of reciprocal feelings between employees to further investigate which employees can be retained by leadership positions with supervisory responsibility and for how long. Depending on the degree of reciprocal behavior of employees, HRM practices that focus on retaining long-term supervisors could differ in their effectiveness across firms and employees. This is especially relevant in times of skills and managerial shortages when employers need to counteract turnover intentions of qualified personnel to retain their high-performing supervisors.

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3.6 Appendix

Table 17: Ordered probit estimation of turnover intentions for supervisors considering HRM practices moderations (showing the coefficients of all control variables)¹²

	coefficients	
	M2	M3
supervisory responsibility		
supervisory responsibility < 1 year	ref.	ref.
supervisory responsibility ≥ 1 year	1.449* (0.773)	0.630 (0.527)
appraisal interviews	0.303 (0.891)	-0.316** (0.150)
appraisal interviews x supervisory responsibility ≥ 1 year	-0.620 (0.907)	
development plans	-0.218* (0.126)	-1.172 (0.823)
development plans x supervisory responsibility ≥ 1 year		0.964 (0.831)
Employee characteristics		
female	0.012 (0.189)	0.018 (0.188)
age	-0.042*** (0.011)	-0.042*** (0.011)
number of children	0.061 (0.093)	0.062 (0.093)
education		
apprenticeship	ref.	ref.
training college	0.015 (0.387)	0.014 (0.386)
technical college	0.480*** (0.185)	0.477*** (0.184)
university degree	0.827*** (0.211)	0.824*** (0.211)
no/other education	0.150 (0.608)	0.151 (0.607)
extraversion	-0.102 (0.106)	-0.098 (0.105)
agreeableness	-0.476*** (0.124)	-0.472*** (0.124)
conscientiousness	0.124 (0.169)	0.122 (0.168)
neuroticism	0.012 (0.098)	0.011 (0.098)

¹² This table is not part of the paper submitted to the *Human Resource Management Journal*.

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	coefficients	
	M2	M3
openness	0.280** (0.136)	0.277** (0.136)
commitment	-0.056*** (0.017)	-0.056*** (0.017)
training	0.163 (0.126)	0.168 (0.127)
tenure	-0.015* (0.008)	-0.015* (0.008)
job satisfaction	-0.482*** (0.073)	-0.479*** (0.073)
fair treatment by the supervisor	-0.300*** (0.086)	-0.298*** (0.086)
perceived support	-0.197*** (0.069)	-0.199*** (0.069)
Establishment characteristics		
establishment size		
small enterprises (10–49)	ref.	ref.
medium-sized enterprises (50–249)	-0.006 (0.413)	-0.014 (0.414)
large enterprises (250 and more)	0.155 (0.153)	0.153 (0.153)
cut point 1	-7.273*** (1.429)	-8.046*** (1.288)
cut point 2	-5.508*** (1.384)	-6.284*** (1.240)
number of observations	1,144	1,144
number of individuals	629	629
number of establishments	284	284
log pseudo-likelihood	-603.158	-602.865

Notes: Dependent variable: turnover intention; dummy variables for year, state and industry included; standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012-2019 and the IAB Establishment Panel 2012-2019

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Table 18: Robustness checks for the analyses on supervisory responsibility and turnover intentions (showing the coefficients of all control variables)¹³

	linear random effects			multilevel ordered probit		
	R1	R2	R3	R4	R5	R6
supervisory responsibility						
no supervisory responsibility	ref.			ref.		
supervisory responsibility < 1 year	-0.304** (0.123)	ref.	ref.	-0.992*** (0.357)	ref.	ref.
supervisory responsibility ≥ 1 year	0.041* (0.022)	0.564** (0.236)	0.284 (0.186)	0.143* (0.078)	1.449* (0.773)	0.630 (0.527)
appraisal interviews	0.007 (0.020)	0.281 (0.270)	-0.085** (0.037)	-0.018 (0.078)	0.303 (0.891)	-0.316** (0.151)
appraisal interviews x supervisory responsibility ≥ 1 year		-0.372 (0.271)			-0.621 (0.907)	
development plans	-0.010 (0.018)	-0.050 (0.033)	-0.054 (0.240)	-0.084 (0.067)	-0.218* (0.126)	-1.172 (0.823)
development plans x supervisory responsibility ≥ 1 year			0.004 (0.241)			0.964 (0.831)
Employee characteristics						
female	-0.003 (0.025)	-0.004 (0.053)	-0.003 (0.053)	-0.004 (0.078)	0.012 (0.189)	0.018 (0.188)
age	-0.013*** (0.001)	-0.010*** (0.003)	-0.010*** (0.003)	-0.047*** (0.005)	-0.042*** (0.011)	-0.042*** (0.011)
number of children	-0.020 (0.014)	0.004 (0.026)	0.004 (0.026)	-0.052 (0.043)	0.061 (0.093)	0.062 (0.093)
education						
apprenticeship	ref.	ref.	ref.	ref.	ref.	ref.

¹³ This table is not part of the paper submitted to the *Human Resource Management Journal*.

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	linear random effects			multilevel ordered probit		
	R1	R2	R3	R4	R5	R6
training college	-0.015 (0.038)	0.029 (0.081)	0.030 (0.081)	-0.103 (0.143)	0.015 (0.387)	0.014 (0.386)
technical college	0.037 (0.027)	0.135*** (0.046)	0.136*** (0.046)	0.124 (0.096)	0.480*** (0.185)	0.477*** (0.184)
university degree	0.110*** (0.029)	0.207*** (0.050)	0.207*** (0.050)	0.447*** (0.100)	0.827*** (0.211)	0.824*** (0.211)
no/other education	-0.011 (0.072)	0.056 (0.157)	0.055 (0.157)	0.012 (0.240)	0.150 (0.608)	0.151 (0.607)
extraversion	0.007 (0.015)	0.002 (0.029)	0.003 (0.029)	0.010 (0.053)	-0.102 (0.106)	-0.098 (0.105)
agreeableness	-0.006 (0.019)	-0.115*** (0.034)	-0.113*** (0.034)	-0.034 (0.066)	-0.476*** (0.124)	-0.472*** (0.124)
conscientiousness	-0.012 (0.024)	0.054 (0.046)	0.055 (0.046)	-0.117 (0.084)	0.124 (0.169)	0.122 (0.168)
neuroticism	0.053*** (0.014)	0.002 (0.026)	0.001 (0.026)	0.203*** (0.048)	0.012 (0.098)	0.011 (0.098)
openness	0.061*** (0.017)	0.069** (0.035)	0.068** (0.035)	0.201*** (0.065)	0.280** (0.136)	0.277** (0.136)
commitment	-0.025*** (0.002)	-0.018*** (0.004)	-0.018*** (0.004)	-0.081*** (0.008)	-0.056*** (0.017)	-0.056*** (0.017)
training	0.026 (0.018)	0.032 (0.033)	0.034 (0.033)	0.117* (0.067)	0.163 (0.126)	0.168 (0.127)
tenure	-0.003** (0.001)	-0.003 (0.002)	-0.003 (0.002)	-0.012*** (0.004)	-0.015* (0.008)	-0.015* (0.008)
job satisfaction	-0.115*** (0.006)	-0.141*** (0.013)	-0.141*** (0.013)	-0.339*** (0.027)	-0.482*** (0.073)	-0.479*** (0.073)
fair treatment by the supervisor	-0.095*** (0.010)	-0.093*** (0.021)	-0.093*** (0.021)	-0.314*** (0.039)	-0.300*** (0.086)	-0.298*** (0.086)

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	linear random effects			multilevel ordered probit		
	R1	R2	R3	R4	R5	R6
perceived support	-0.043*** (0.008)	-0.048*** (0.017)	-0.049*** (0.017)	-0.148*** (0.029)	-0.198*** (0.069)	-0.199*** (0.069)
Establishment characteristics						
establishment size						
small enterprises (10–49)	ref.	ref.	ref.	ref.	ref.	ref.
medium-sized enterprises (50–249)	0.152 (0.119)	0.072 (0.220)	0.071 (0.220)	0.551*** (0.173)	-0.007 (0.413)	-0.014 (0.414)
large enterprises (250 and more)	0.072*** (0.024)	0.034 (0.043)	0.034 (0.043)	0.253*** (0.096)	0.155 (0.153)	0.153 (0.153)
number of observations	4,351	1,144	1,144	4,351	1,144	1,144
number of individuals	1,924	629	629	1,924	629	629
number of establishments	458	284	284	458	284	284
R ² (linear model)/ log pseudo-likelihood (multilevel model)	0.362	0.386	0.386	-2,583.089	-603.156	-602.862

Notes: Dependent variable: turnover intention; dummy variables for year, state and industry included; standard errors clustered at the establishment level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2012–2019 and the IAB Establishment Panel 2012–2019

Table 19: Definitions and descriptions of all variables used in the analyses on supervisory responsibility and turnover intentions¹⁴

Variable name (label in Do-File)	Original variable(s)	Dataset(s)	Description
turnover intention (toi_beruflich)	mturnover, mturnover_grund	lpp_employee	categorical measure on a scale from 1 to 3 of how often an employee thinks about changing their job due to professional reasons: <ul style="list-style-type: none"> • 1: low turnover intentions = “never” • 2: moderate turnover intentions = “a few times a year” • 3: high turnover intentions = “a few times a month”, “a few times a week”, “daily”

¹⁴ This table is not part of the paper submitted to the *Human Resource Management Journal*.

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Variable name (label in Do-File)	Original variable(s)	Dataset(s)	Description
supervisory responsibility (<i>PV_Zeit</i>)	mleitung, mleitung_seit	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual does not have supervisory responsibility (=does not supervise others) • 2, if the individual has obtained supervisory responsibility within the last year (short-term) • 3, if the individual has had supervisory responsibility for a year or longer (long-term)
appraisal interviews (<i>MAGespraeche_AN</i>)	mmagespr	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual has had a structural appraisal interview during the least year • 0, otherwise
development plans (<i>Entwicklungsplaene_FK_pruef</i>)	bentwplan, bentwplan_fk_v1, bentwplan_fk, entwplan_pruef, bentwplan_fk	lpp_employer	<ul style="list-style-type: none"> • 1, if development plans for supervisors exist and are systematically reviewed at the respective establishment • 0, otherwise
female (<i>female</i>)	msex	lpp_employee	<ul style="list-style-type: none"> • 1, if the employee is female • 0, otherwise
age (<i>Alter</i>)	mgebjahr	lpp_employee	the age of the individual (in years)
number of children (<i>Kinder</i>)	mkind_anz, mhhgroesse, mpartner_hh	lpp_employee	the number of children under 14 years that live within the household
educational level (<i>Ausbildung</i>)	mausb	lpp_employee	
apprenticeship (<i>Lehre</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is an apprenticeship • 0, otherwise
training college (<i>Beruflich_schulisch</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a training college • 0, otherwise
technical college (<i>Fachschule</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a technical college • 0, otherwise
university degree (<i>Fach_Hochschulabschluss</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a university degree • 0, otherwise

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Variable name (label in Do-File)	Original variable(s)	Dataset(s)	Description
no/other education (keine_andere_Ausbildung)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is other or no education • 0, otherwise
extraversion (Extraversion)	mbig_komm, mbig_gesell, mbig_zur	lpp_employee	measure of the Big Five personality characteristic extraversion on a scale from 1 to 5
agreeableness (Verträglichkeit)	mbig_grob, mbig_verzeih, mbig_freundl	lpp_employee	measure of the Big Five personality characteristic agreeableness on a scale from 1 to 5
conscientiousness (Gewissenhaftigkeit)	mbig_gruend, mbig_faul, mbig_effi	lpp_employee	measure of the Big Five personality characteristic conscientiousness on a scale from 1 to 5
neuroticism (Neurotizismus)	mbig_sorgen, mbig_nervoes, mbig_entsp	lpp_employee	measure of the Big Five personality characteristic neuroticism on a scale from 1 to 5
openness (Offenheit)	mbig_origi, mbig_kunst, mbig_phant, mbig_wissb	lpp_employee	measure of the Big Five personality characteristic openness on a scale from 1 to 5
commitment (commitment)	mcom_rest, mcom_bedeut, mcom_identif, mcom_zugehoer, mcom_emo, mcom_teil	lpp_employee	measure of commitment of an employee toward his organization on a scale from 0 to 30
training at the workplace (Training)	mwb	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual has participated in any courses of further vocational training in the last two years • 0, otherwise
tenure (tenure)	jahr, eintritt	Integrated Employment Biographies	length of time an individual has been employed by the current employer (in years)
job satisfaction (satisfaction_job)	msat_job	lpp_employee	measure of an employee's overall job satisfaction on a scale from 1 to 10
fair treatment by the supervisor (fairness_supervisor)	mfair_fk	lpp_employee	measure of an employee's perception of fair treatment by its supervisor on a scale from 1 to 5
perceived support (support_development)	merf_entw	lpp_employee	measure of an employee's perceived support from their organization concerning the development of their professional knowledge and competences on a scale from 1 to 5
establishment size (Betriebsgröße_kategorial)	t30ges, v25ges, x26ges, z27ges	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if the establishment has 1–9 employees (micro enterprises) – not in the sample

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Variable name (label in Do-File)	Original variable(s)	Dataset(s)	Description
			<ul style="list-style-type: none"> • 2, if the establishment has 10–49 employees (small enterprises) • 3, if the establishment has 50–249 employees (medium-sized enterprises) • 4, if the establishment has 250 and more employees (large enterprises)
survey wave (jahr)	YEAR	IAB Establishment Panel	<ul style="list-style-type: none"> • 2014: wave 2 (2014/2015) • 2016: wave 3 (2016/2017) • 2018: wave 4 (2018/2019)
state (Bundesland)	bula2012, bula2014, bula2016, bula2018	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if state is Schleswig-Holstein • 2, if state is Hamburg • 3, if state is Lower Saxony • 4, if state is Bremen • 5, if state is North Rhine-Westphalia • 6, if state is Hesse • 7, if state is Rhineland-Palatinate • 8, if state is Baden-Württemberg • 9, if state is Bavaria • 10, if state is Saarland • 11, if state is Berlin • 12, if state is Brandenburg • 13, if state is Mecklenburg Western Pomerania • 14, if state is Saxony • 15, if state is Saxony-Anhalt • 16, if state is Thuringia
industry (Branche15)	t89b, v89b, x89b, z91b	IAB Establishment Panel	<ul style="list-style-type: none"> • 2, if industry is mining and quarrying • 3, if industry is electricity, gas and water supply, water and scrap, disposal, recycling • 4, if industry is manufacturing • 5, if industry is construction • 6, if industry is trade

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Variable name (label in Do-File)	Original variable(s)	Dataset(s)	Description
			<ul style="list-style-type: none"> • 7, if industry is transport and storage • 8, if industry is information, communication • 9, if industry is accommodation and food services • 10, if industry is financial and insurance services • 11, if industry is business support, scientific and other professional services • 12, if industry is education • 13, if industry is human health and social work • 14, if industry is other services • 15, if industry is non-profit organizations, public administration
persnr (<i>persnr</i>)	persnr	lpp_employee	unique individual identification number
idnum (<i>idnum</i>)	betnr, idnum	lpp_employee, lpp_employer, IAB Establishment Panel	unique establishment identification number

Sick of leading? Supervisory responsibility and its consequences for sickness absenteeism and sickness presenteeism

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- the 19th Research Colloquium “Economic and Corporate Policy” in Sion, Switzerland,
- the Annual Meeting of the European Academy of Management (EURAM) 2023 in Dublin, Ireland,
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- the Annual Meeting of the British Academy of Management (BAM) 2023 in Brighton, United Kingdom,
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Abstract: This research examines the impact of leadership positions with supervisory responsibility on two labor-market related health behaviors – sickness absenteeism and sickness presenteeism, i.e., working while being sick. Drawing on the job demands-resources (JD-R) model, this study posits that supervisory responsibility, serving as both a job resource and a demand, increases work engagement among leaders. This heightened work engagement, in turn, reduces sickness absenteeism while concurrently increasing sickness presenteeism behavior. The study identifies two key aspects of leadership positions with supervisory responsibility –

¹⁵ The data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access.

permanent availability and time pressure – as two underlying mechanisms driving the observed reduction in sickness absenteeism and the increase in sickness presenteeism. Using German linked employer-employee data, the empirical results suggested that having supervisory responsibility reduces sickness absenteeism while at the same time elevating the engagement in sickness presenteeism. Furthermore, these relationships are partially mediated by leaders' need for permanent availability and the time pressure inherent in positions with supervisory responsibility. Intriguingly, the results reveal that the decreased sickness absenteeism among leaders can be attributed to improved overall health rather than higher rates of sickness presenteeism. In summary, this research advances our understanding of job characteristics of leadership positions by illustrating that job demands can yield favorable outcomes, offering valuable insights into the complex interplay between leadership positions and leaders' health behaviors.

Keywords: supervisory responsibility, leadership, sickness absenteeism, sickness presenteeism, job demands-resources model

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4.1 Introduction

Nowadays, many young professionals no longer aspire to attain leadership positions within their careers anymore. This paradigmatic change can be attributed to the growing concern among potential leaders regarding the inherent demands associated with such positions that can have adverse health outcomes, including severe stress and high burnout rates. As a result, it becomes increasingly hard for organizations to fill leadership positions. But is it really true: Does leading make you sick? And is this caused by the expectation for leaders to be permanently available, coupled with time pressures inherent to such positions? Recognizing that a transition into a leadership position with supervisory responsibility can be both fulfilling and challenging, the relationship between leadership and health remains unclear, as highlighted by Fletcher and French (2021). More research on leadership and health is needed, calling for deeper investigation into various aspects of leadership positions and their potential effects on health (Inceoglu et al., 2021; Wegge et al., 2014).

To shed more light on the relationship between a leadership position with supervisory responsibility and health, this study focuses on two labor-market related health behaviors: sickness absenteeism and sickness presenteeism. These health behaviors hold critical significance for organizations due to their economic costs, including productivity losses (C. Dietz and Zacher, 2022; Grinza and Rycx, 2020; Keloharju et al., 2023; Yang et al., 2023) and heightened sickness absenteeism among other employees (C. Dietz et al., 2020). Furthermore, sickness absenteeism and sickness presenteeism serve as good indicators of an individual's health (Gerich, 2015a) making them pertinent for both employees and society. Understanding the factors within leadership positions that influence these health behaviors is imperative. This knowledge can assist organizations in providing support to their leaders, enabling them to effectively navigate the demands of their positions and retain qualified personnel. Thus, this study aims to investigate how leadership positions with supervisory responsibility impact an employee's sickness absenteeism and sickness presenteeism behavior, particularly examining the role of the demands for permanent availability and time pressure.

Based on the job demands-resources (JD-R) model by Demerouti et al. (2001), this paper posits that supervisory responsibility can function as both a job resource and demand. The model predicts that it may reduce sickness absenteeism but increase sickness presenteeism behavior. More precisely, this study follows Crawford et al.'s. (2010) differentiation of job

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demands and classifies supervisory responsibility as a challenge job demand due to the expectations of permanent availability and time pressures inherent to these positions: Supervisory responsibility acts as a job resource, fostering work engagement, while concurrently also serving as a challenge demand, promoting personal growth and motivation, leading to higher work engagement as well. The increased work engagement reduces sickness absenteeism but raises presenteeism behavior. Thus, I argue that the characteristics of supervisory responsibility that categorize it as a challenge job demand – namely, permanent availability and time pressure – are the driving factors explaining sickness absenteeism and presenteeism.

This research contributes to the literature in several aspects. Although prior studies have explored leadership's influence on followers' health (see, e.g., physical health, Franke et al., 2014; Zwingmann et al., 2014; psychological health, Walsh et al., 2014; burnout, Schaufeli, 2015; sickness absenteeism, C. Dietz et al., 2020; K. Nielsen and Daniels, 2016; Rugulies et al., 2021), little attention has been given to leaders' own health. Furthermore, studies on leadership positions with supervisory responsibility and related health outcomes have primarily focused on well-being (Fletcher and French, 2021; W.-D. Li et al., 2018), mental health (Boyce and Oswald, 2012), emotional exhaustion (Debus et al., 2019), or health in general (Schieman and Reid, 2009), presenting mixed results and often overlooking sickness absenteeism. Despite some of these studies suggested that leadership positions with supervisory responsibility may lead to increased emotional exhaustion (see, e.g., Debus et al., 2019), others found no significant association, citing a balance between stress and resources at higher status levels (see, e.g., Schieman and Reid, 2009). Additionally, Fletcher and French (2021) disclosed that individuals experience a higher level of tension through supervisory responsibility in the short run but in the long run, a leader's emotional well-being is improved. Notably, although a limited number of studies have explored sickness absenteeism, none have specifically investigated the phenomenon of supervisory responsibility in this context. Existing research by Kröger (2017), M. L. Nielsen et al. (2004), and Keloharju et al. (2023) has examined sickness absenteeism in higher job levels, decision authority, and CEO positions, respectively, but did not delve into the unique attributes of leadership positions with supervisory responsibility.

As such, this research stands out as the first to quantify the impact of leadership positions with supervisory responsibility on sickness absenteeism. By addressing this neglected aspect, this study aids in enhancing the understanding of how supervisory responsibility may influence absenteeism patterns within the workplace. This is particularly relevant for organizations as it

sheds light on a critical aspect of leadership positions with supervisory responsibility and its potential implications for employee health and productivity, ultimately benefiting organizations in optimizing their leadership strategies.

Second, although there is evidence in the literature that supervisory responsibility induces sickness presenteeism (Arnold, 2016; Hansen and Andersen, 2008; Miraglia and Johns, 2016), this study extends existing research by distinguishing the effects of supervisory responsibility on sickness presenteeism and sickness absenteeism. It suggests that supervisors' reduced absenteeism is not driven by their engagement in sickness presenteeism but by better overall health.

Third, this study responds to Bakker and Demerouti's (2017) call to investigate challenge job demands more explicitly within the JD-R model. Specifically, it extends the model's explanatory power by demonstrating that the two challenge job demands permanent availability and time pressure are mediating factors partially explaining the relationship between leadership positions with supervisory responsibility and sickness absenteeism and presenteeism. Even though some studies have previously examined job demands like time pressure (Stiglbauer, 2017) and work cell phone use (Ragsdale and Hoover, 2016), their focus has been narrower, and they uncovered adverse effects on well-being and emotional exhaustion. Additionally, Nyberg et al. (2022) found that high job demands did not mediate the relationship between employment in the Swedish healthcare industry and sickness absenteeism. Thus, this research contributes by empirically quantifying that permanent availability and time pressure in leadership positions with supervisory responsibility partially explain sickness absenteeism and presenteeism. This work adds a crucial layer to the limited body of literature exploring the association between job demands, job resources, and health consequences within the JD-R model and is particularly relevant for organizations seeking to understand and mitigate the health-related consequences of leadership roles with supervisory responsibility.

4.2 Theoretical background and hypotheses development

To develop the theoretical argument, I draw upon the JD-R model (Demerouti et al., 2001). Though it was originally formulated to identify the antecedents of engagement and burnout, it has also been widely used to explain other health-related outcomes (see, e.g., well-being (Stiglbauer, 2017), sickness absenteeism (Schaufeli et al., 2009)). Accordingly, it embodies an excellent theoretical basis to investigate the relationship between a leadership position with supervisory responsibility, its job characteristics, and health-related outcomes, i.e., sickness absenteeism and sickness presenteeism.

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The JD-R model states that the characteristics of any job can be classified into two general categories: job demands and job resources. Within the model, job demands refer to “physical, social, or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs” (Demerouti et al., 2001, p. 501). These can be stressors such as noise, time and work pressure, or quantitative workload. Conversely, job resources can be described as those aspects of a job that reduce job demands, stimulate personal development, or are functional in achieving work goals (Demerouti et al., 2001, p. 501).

Generally, the JD-R model implies two diverging processes: First, job resources activate a motivational process that, consequently, leads to work engagement. Second, the model assumes that job demands cause constant overtaxing which, in the end, results in exhaustion and disengagement. To explain why previous research has revealed inconsistent findings in the latter process, Crawford et al. (2010) refined the JD-R model. In their extension of the JD-R model, they claimed that although the effects of job resources on work engagement are consistent, the relationships between job demands and (dis)engagement highly depend on the nature of the demand. More precisely, the authors differentiated between challenge and hindrance job demands. Concerning hindrance demands, Crawford et al. (2010) argued that employees perceive these demands as stressful because they potentially constrain personal growth, learning, and goal attainment. They tend to trigger negative emotions and a passive style to cope with the demand because the effort expended on coping with the demand is not reasonable concerning the likelihood that the demand is adequately dealt with. Therefore, individuals are less willing to invest effort which leads to little motivation to cope with the demand and consequently results in disengagement. Challenge demands, on the contrary, are controllable demands that have the potential to promote opportunities to learn, personal growth, or future gains. They trigger positive emotions and an active, problem-focused coping style. Individuals believe that this job demand can be met through a reasonable amount of effort and that the outcome is valued. This sense of goal achievement and the meaningfulness of the expended effort to cope with the demand leads to motivation, eagerness, and excitement which in consequence, increases work engagement.

When I apply this model to the context of interest, supervisory responsibility seems to be an ambiguous job characteristic. On the one hand, supervisory responsibility can be seen as a job resource: While it implies a high level of job control (Blom et al., 2016; Christie and Barling, 2009; W.-D. Li et al., 2018), it, concurrently, also entails regular participation in decision-

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making (Debus et al., 2019). On the other hand, previous research has also perceived supervisory responsibility as a job demand (Blom et al., 2016; Lovelace et al., 2007) because a job with high responsibility is characterized by time pressure and a high workload (Debus et al., 2019; Kröger, 2017). However, these characteristics are not only aspects of job demands stated in the JD-R model but more explicitly, following Crawford et al. (2010) characteristics of a challenge demand because they potentially stimulate personal growth and evoke future gains.

This ambiguity of supervisory responsibility is also reflected in the two induced processes of the JD-R model. First, supervisory responsibility being a job resource motivates an employee and leads to work engagement. Second, supervisory responsibility can also be classified as a job demand, in particular a challenge demand. This also increases an employee's motivation and effort, so that employees will be more engaged in their work. Both primarily ambiguous processes lead to higher work engagement. Considering that engagement is associated with lower levels of absenteeism (Soane et al., 2013), I put forward the following hypothesis:

Hypothesis 1 (H1): Supervisory responsibility relates negatively to sickness absenteeism.

As argued above, supervisory responsibility being a job resource and a challenge demand leads to fewer sickness absenteeism days as a result of higher work engagement. However, work engagement as a consequence of supervisory responsibility not only reduces sickness absenteeism days per se but can also lead to working while being sick, i.e. engaging in sickness presenteeism (Miraglia and Johns, 2016). An engaged employee has positive feelings toward work and is overly motivated which stimulates sickness presenteeism behavior (Miraglia and Johns, 2016). To conclude, I expect supervisory responsibility to also have a positive effect on sickness presenteeism which leads to the following hypothesis:

Hypothesis 2 (H2): Supervisory responsibility relates positively to sickness presenteeism.

Following the call of Bakker and Demerouti (2017) to consider challenge job demands more explicitly and to test their causality within the JD-R model, I examine whether the aspects of supervisory responsibility that identify it as a challenge job demand are the causal mechanisms explaining sickness absenteeism and respectively sickness presenteeism. Leadership positions with supervisory responsibility are, among other things, characterized by the need to be permanently available, e.g., to give support, answer questions, or solve upcoming problems (McDonald et al., 2009). Employees transitioning into a leadership position with supervisory responsibility are also confronted with an increased number of tasks and responsibilities where,

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at first, no problem-solving strategies are available. This challenges leaders' time-related resources and, therefore, induces time pressure (Debus et al., 2019; Rigotti et al., 2014).

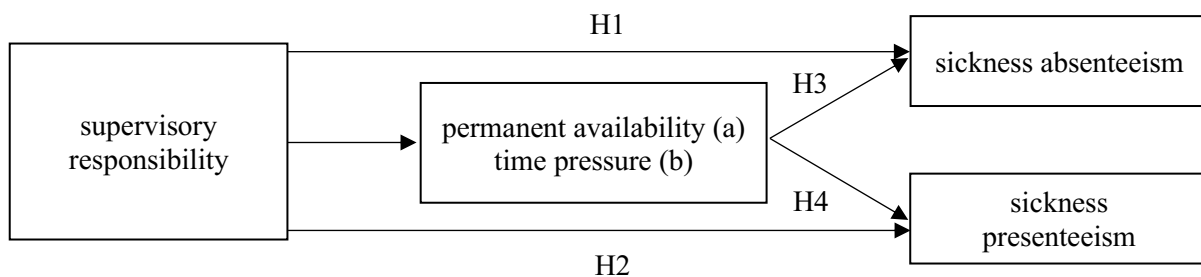
Both of these aspects of a leadership position with supervisory responsibility follow the definition of a challenge demand according to the theoretical argumentation of Crawford et al. (2010). Permanent availability assumes that leaders react to work-related demands also in their leisure time (Müller et al., 2018; Steffensen et al., 2022). This gives the leader the feeling of being indispensable but also the opportunity to grow professionally and resolve upcoming problems. In line with this, time pressure, as an indicator of work intensity (Müller et al., 2018), gives the respective leader the feeling of having important tasks and responsibilities and of being essential to their organization. Accordingly, the need to be permanently available and the time pressure experienced in a leadership position with supervisory responsibility promote opportunities to learn and stimulate personal growth. This increases an employee's work engagement and in consequence, reduces the number of sickness absenteeism days of an employee respective increases the sickness presenteeism behavior as discussed above. I, therefore, advance the following hypotheses:

Hypothesis 3 (H3a/b): Permanent availability (a) and time pressure (b) mediate the relationship between supervisory responsibility and sickness absenteeism.

Hypothesis 4 (H4a/b): Permanent availability (a) and time pressure (b) mediate the relationship between supervisory responsibility and sickness presenteeism.

Figure 1 visualizes the conceptual framework of this study.

Figure 2: Conceptual framework of the relation between supervisory responsibility, permanent availability, time pressure, and sickness absenteeism respectively sickness presenteeism



4.3 Methods

4.3.1 Sample

For the empirical analyses, this article used data from the Linked Personnel Panel (LPP). This is a unique employer-employee panel data set provided by the German Institute of

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Employment Research (IAB), representative of German private-sector establishments with at least 50 employees liable to social security (Mackeben et al., 2023). Additionally, I linked the LPP data to the administrative individual-level data from the Integrated Employment Biographies provided by the Federal Employment Agency (LPP-ADIAB). Furthermore, I matched the LPP data to the IAB Establishment Panel (Bellmann et al., 2021) to obtain more structural information on the establishments (e.g., industry, establishment size). These multiple sources are a major benefit of the data set that warrants its use: it links employee-level information (e.g., attitudes towards work, personality, job characteristics) with establishment-level information on management practices, corporate culture, and firm policies (Ruf, Mackeben, Grunau, and Wolter, 2020). This allows a simultaneous consideration of employee and employer perspectives. Additionally, it entails copious details on job demands relevant to examine the mediating effects. Although five waves of the data set have been conducted up to the present time, only the four waves from the years 2012/2013, 2014/2015, 2016/2017, and 2018/2019 can currently be linked to the administrative data. Consequently, I used the first four waves for the empirical analyses.

For the analyses, I restricted the sample to employees aged 67 or younger following the statutory retirement age in Germany. Consequently, the final sample considering *sickness absenteeism* as the dependent variable comprised 12,676 observations from 9,179 employees, working in 1,216 firms (sample I). Because information on the main variable *sickness presenteeism* is only observed from wave 3 onwards, I only used waves 3 and 4 for the analyses considering *sickness presenteeism* as the dependent variable (sample II). Thus, the final sample of Sample II consisted of 4,945 observations from 4,262 individuals working for 768 employers.

4.3.2 Measures

Main variables

In the analyses, the two dependent variables were *sickness absenteeism* and *sickness presenteeism*. I measured the dependent variable *sickness absenteeism* by the self-reported number of days an individual was unable to work in the last year due to illness. This explicitly included the total number of days and not only the number of days with an official doctor's note. Considering that research has shown that self-reported days of sickness absenteeism are strongly associated with recorded sickness absenteeism days from employers' registers (Ferrie et al., 2005), they are a reliable predictor for sickness absenteeism. In addition, the effect of an employee working while being sick is captured by the variable *sickness presenteeism*, which

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relies on employee self-reported information of how many days an individual went to work albeit being sick within the last year. Following Gerich (2015b), I calculated the variable as the propensity of presenteeism days to the sum of presenteeism and absenteeism days¹⁶.

The central independent variable was *supervisory responsibility*. It was operationalized as a binary variable that takes the value one if the individual is supervising other employees and zero otherwise. To examine the theoretically derived mediating effects of the job demands of being permanently available (a) and having time pressure at work (b), I measured *permanent availability* by the question “How often do you receive business phone calls during your leisure time or how often do you answer business e-mails?”. The categorical single-item measure is operationalized with values from 1=“never” to 5=“daily” on a five-point Likert scale. I quantified the categorical variable *time pressure* by the statement “I often have time pressure over a long period, or I have to deal with several important tasks at the same time” with answers ranging from “does not apply” (=1) to “fully applies” (=5) on a five-point Likert scale.

Control variables

Additionally, several other factors determine the number of sickness absenteeism days as well as sickness presenteeism behavior. I, consequently, followed the literature on sickness absenteeism and sickness presenteeism (Brborović et al., 2017; Gosselin et al., 2013) and controlled for three groups of explanatory factors: individual characteristics, job characteristics, and establishment characteristics. Factors on the individual level comprised whether an employee is *female* (Bekker et al., 2005; Lidwall and Marklund, 2006), their *age* (Gosselin et al., 2013), a subjective ranking of an individual’s current *health status* measured on a five-point Likert scale (Gosselin et al., 2013; Montani et al., 2020), and the *Big Five personality characteristics* in line with the literature that emphasizes an individual’s personality in determining sickness absenteeism and presenteeism (Consiglio et al., 2013; Lu et al., 2013). Furthermore, based on the vast amount of literature claiming the importance of an individual’s socioeconomic status when estimating sickness absenteeism and presenteeism (Bratberg et al., 2002; Kristensen et al., 2010; Marmot, 1994; Vahtera et al., 1996), I included the variables of having a *partner that lives in the same household*, the *number of children* under the age of 14, the *size of the household*, five dummy variables indicating an individual’s *education level* as well as an individual’s *gross income*.

¹⁶ It should be noted that this propensity is only computable for employees whose number of sickness absenteeism and sickness presenteeism days exceeds zero.

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Within the group of job characteristics, I controlled for an individual's *tenure* with the current employer (Tompa et al., 2008) and an individual's working time (Bernstrøm, 2013), measured by the binary variable *part-time* and the number of *overtime hours*. In line with the JD-R model (Demerouti et al., 2001) and research that has examined the influence of job resources and job demands on sickness absenteeism and sickness presenteeism (Jacobsen and Fjeldbraaten, 2018; Johns, 2010; Pousette and Hanse, 2002; Schaufeli et al., 2009), I further included the amount of supervisory responsibility captured by the *number of subordinates* an individual supervises, whether the individual can *work from home*, and measures for *physical exertion* and a *bad working environment*.

Finally, the last group assessed influencing factors on the establishment level and encompassed the *establishment size* as well as 15 *industry* dummy variables. Finally, I included a dummy variable for each survey wave to correct for time effects.

Descriptive statistics

Table 20 reports summary statistics for all the variables used in the analyses. As Column 1 (Sample I) depicts, the average yearly number of sickness absenteeism days in the sample was 12.1, which only slightly exceeds the average number of registered sickness absenteeism days in Germany with 10.9 reported by the German Federal Statistical Office (2022) in 2019. Also, around 30% of the sample were in a leadership position with supervisory responsibility and 27% percent were female. Although most individuals did not feel the need to be permanently available (2.0), they did experience high time pressure at work (3.6). Table 21 provides initial insights into the proposed relationships: as expected, the average number of sickness absenteeism days and the propensity of sickness presenteeism differed significantly if comparing supervisors to non-supervisors. Additionally, permanent availability and time pressure were both more common for supervisors than for non-supervisors.

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Table 20: Descriptive statistics of all variables included in the analyses on supervisory responsibility and sickness absenteeism respectively sickness presenteeism

	Mean	SD	Min	Max
Main variables				
sickness absenteeism	12.08	24.27	0	230
sickness presenteeism ^a	0.454	0.346	0	1
supervisory responsibility	0.295	–	0	1
permanent availability	2.022	1.112	1	5
time pressure	3.570	1.194	1	5
Individual characteristics				
female	0.267	–	0	1
age	47.270	10.170	18	67
health status	3.660	0.931	1	5
extraversion	3.643	0.741	1	5
openness	3.636	0.634	1	5
agreeableness	4.047	0.570	1.667	5
neuroticism	2.691	0.766	1	5
conscientiousness	4.349	0.482	1.333	5
partner in the same household	0.790	–	0	1
number of children	0.384	0.750	0	7
size of the household	2.776	1.208	1	14
education				
apprenticeship	0.454	–	0	1
training college	0.089	–	0	1
technical college	0.215	–	0	1
university degree	0.221	–	0	1
no/other education	0.021	–	0	1
income	2,494.5	2,286.8	1	170,000
Job characteristics				
tenure	14.75	10.56	0	44
part-time	0.126	–	0	1
overtime hours	3.792	4.538	0	60.20
number of subordinates	2.260	1.411	1	5
physical exertion	2.743	1.523	1	5
bad working environment	14.75	10.56	0	44
work from home	0.126	–	0	1
Establishment characteristics				
establishment size				
micro enterprises (less than 10)	0.001	–	0	1
small enterprises (10–49)	0.019	–	0	1
medium-sized enterprises (50–249)	0.609	–	0	1
large enterprises (250 and more)	0.371	–	0	1

Notes: Descriptive statistics of individual-level variables are based on 12,676 individual-level observations from 9,179 employees, descriptive statistics of establishment characteristics are based on 1,216 establishments (Sample I), ^a Descriptive statistics of the variable sickness presenteeism are based on Sample II (4,945 observations from 4,262 individuals)

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

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Table 21: Descriptive statistics of the main variables included in the analyses on supervisory responsibility and sickness absenteeism respectively sickness presenteeism by leadership position

	Non-supervisors	Supervisors	Difference
sickness absenteeism	13.105	9.623	3.481***
sickness presenteeism ^a	0.433	0.514	-0.081***
permanent availability	1.790	2.577	-0.786***
time pressure	3.419	3.932	-0.513***

Notes: Descriptive statistics of the variables sickness absenteeism, permanent availability and time pressure are based on Sample I; ^a Descriptive statistics of the variable sickness presenteeism are based on Sample II;

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

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

4.3.3 Estimation strategy

To test the predicted relationships of Hypotheses 1 and 2, I estimated two different model specifications. First, I run a random-effects negative binomial regression to examine the relation between supervisory responsibility and sickness absenteeism. Given that the dependent variable *sickness absenteeism* is a count variable and highly right-skewed, an ordinary least squares regression model is not suitable. Instead, a count data model should be favored. The commonly used model for the estimation of count data is the Poisson model, which assumes equidispersion, meaning that the (conditional) variance equals the (conditional) mean. However, a formal test of overdispersion revealed that the present data are significantly overdispersed¹⁷. In this case, a Poisson model would underestimate the dispersion in the outcome. A negative binomial regression model addresses this problem of the Poisson model by adding a parameter α that reflects unobserved heterogeneity among observations (Long and Freese, 2014, p. 243). Seeing that there is significant evidence of overdispersion in the present data, I followed the suggestions of Long and Freese (2014) and previous research on sickness absenteeism (Johns, 2011; Platts et al., 2020) and preferred a negative binomial model over a Poisson model. When estimating *sickness presenteeism* (H2), I run a linear random-effects model. Considering that the panel only consists of two waves, a random-effects model is preferred over a fixed-effects model.

Furthermore, to estimate the causal mechanisms of permanent availability and time pressure transmitting the effect of supervisory responsibility on the outcome variables sickness absenteeism and sickness presenteeism, I employed multiple mediation analyses. More precisely, I run two separate models for each dependent variable to test Hypotheses 3 (a/b) and

¹⁷ The test rejects the null hypothesis of equidispersion with $p < 0.001$ ($t = 15.66$). This means that the (conditional) variance of the data exceeds the (conditional) mean (Cameron and Trivedi 2009, p. 561).

4 (a/b) as depicted in Figure 2. For the calculation of the causal mediation effects, I follow the approach of Hicks and Tingley (2011), which produces identical results to the traditional approach by Baron and Kenny (1986) for continuous variables.¹⁸ Considering that this approach only allows the computation of OLS, probit, and logit models and no panel estimators, I estimated a pooled linear model for both *sickness absenteeism* and *sickness presenteeism*.

4.4 Results

4.4.1 Baseline results

To test hypothesis 1, I examined the results of the negative binomial regression, which are displayed in Table 22 (Model M1). Column 1 shows the regression coefficients whereas Column 2 gives deeper insights into the effect sizes by displaying average marginal effects and incidence rate ratios (IRR). The latter display how the expected count changes for a unit change in the independent variable (Long and Freese, 2014). The statistically significant and negative coefficient of *supervisory responsibility* in the first column provides empirical support for hypothesis 1. To be more precise, an individual in a leadership position with supervisory responsibility reported on average around 1.7 fewer sickness absenteeism days ($p < 0.01$) respectively missed 13.0 percent less ($IRR = 0.870$; $p < 0.01$) due to sickness compared to an individual without supervisory responsibility (Column 2). This not only supports the postulated hypothesis (H1) but, also, stresses the economic relevance of this result.

Table 22: Estimation results of sickness absenteeism and sickness presenteeism

variable	sickness absenteeism (M1)		sickness presenteeism (M2)
	coefficient	average marginal effect [IRR]	coefficient
supervisory responsibility	-0.139*** (0.030)	-1.654*** (0.352) [0.870***]	0.062*** (0.012)
Individual characteristics			
female	0.130*** (0.033)	1.545*** (0.388) [1.139***]	0.009 (0.014)
age	-0.007*** (0.001)	-0.087*** (0.018) [0.993***]	-0.002*** (0.001)
health status	-0.387*** (0.014)	-4.587*** (0.193) [0.679***]	0.002 (0.007)

¹⁸ As suggested by Imai et al. (2010), I conduct sensitivity analyses of a potential violation of the key underlying assumption of sequential ignorability. The results are available in Appendix A.

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variable	sickness absenteeism (M1)		sickness presenteeism (M2)
	coefficient	average marginal effect [IRR]	coefficient
extraversion	0.094*** (0.018)	1.109*** (0.206) [1.098***]	-0.005 (0.007)
openness	0.072*** (0.022)	0.852*** (0.263) [1.075***]	-0.004 (0.008)
agreeableness	0.047* (0.025)	0.553* (0.299) [1.048**]	-0.031*** (0.009)
neuroticism	0.048*** (0.018)	0.569*** (0.214) [1.049***]	0.023*** (0.006)
conscientiousness	-0.105*** (0.033)	-1.243*** (0.389) [0.900***]	0.057*** (0.010)
partner in the same household	0.136*** (0.034)	1.611*** (0.407) [1.146***]	0.015 (0.014)
number of children	0.078*** (0.018)	0.922*** (0.216) [1.081***]	-0.003 (0.009)
size of the household	-0.039*** (0.013)	-0.460*** (0.155) [0.962***]	-0.000 (0.006)
education (ref.: apprenticeship)			
training college	0.021 (0.045)	0.245 (0.529) [1.021]	0.006 (0.020)
technical college	-0.035 (0.032)	-0.415 (0.378) [0.966]	0.022* (0.013)
university degree	-0.070** (0.035)	-0.836** (0.420) [0.932**]	-0.018 (0.014)
no/other education	-0.029 (0.100)	-0.346 (1.183) [0.971]	-0.014 (0.035)
income ^a	-0.027 (0.098)	-0.320 (1.167) [1.000]	-0.029*** (0.010)
Job characteristics			
tenure	-0.001 (0.001)	-0.014 (0.016) [0.999]	0.001*** (0.001)
part-time	-0.159*** (0.046)	-1.885*** (0.549) [0.853***]	0.005 (0.017)

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variable	sickness absenteeism (M1)		sickness presenteeism (M2)
	coefficient	average marginal effect [IRR]	coefficient
overtime hours	-0.013*** (0.003)	-0.156*** (0.036) [0.987***]	0.007*** (0.002)
number of subordinates	-0.001 (0.001)	-0.012 (0.010) [0.999]	0.000 (0.000)
physical exertion	0.025** (0.011)	0.300** (0.133) [1.026**]	0.005 (0.005)
bad working environment	0.060*** (0.009)	0.716*** (0.109) [1.062***]	-0.003 (0.004)
work from home	-0.093*** (0.030)	-1.103*** (0.351) [0.911***]	0.017 (0.014)
Establishment characteristics			
establishment size (ref.: small enterprises (10–49))			
micro enterprises (less than 10)	-0.408 (6.900)	-4.206 (57.472) [0.665]	
medium-sized enterprises (50–249)	-0.073 (0.167)	-0.885 (2.093) [0.929]	0.419*** (0.085)
large enterprises (250 and more)	-0.049 (0.170)	-0.596 (2.131) [0.952]	0.024 (0.068)
constant	0.513*** (0.239)		0.312*** (0.106)
number of observations	12,676	12,676	4,945
number of individuals	9,179	9,179	4,262
number of establishments	1,216	1,216	768
log (pseudo-)likelihood (m1)/R ² (m2)	-4,0547.447		0.041

Notes: Dummy variables for survey wave and industry included; standard errors in parentheses (M1: bootstrapped standard errors with 200 resamples, M2: standard errors clustered at the establishment level). Incidence rate ratios in brackets; ^a Coefficients and standard errors multiplied by 10,000; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

Next, to quantify the relationship between supervisory responsibility and sickness presenteeism (H2), I examined the results of the random-effects regression, which are displayed in Table 22 (Model M2). Looking at the results of the variable *supervisory responsibility*, the coefficient is statistically significant and positive. Thus, hypothesis 2, stating that supervisory responsibility increases sickness presenteeism, finds support. The results suggest that for

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individuals in a leadership position with supervisory responsibility the propensity of working while being sick is 6.2 percentage points higher ($p < 0.01$) than for individuals in a position without supervisory responsibility.

In the next step, I examined the results of the mediating effects of permanent availability and time pressure, which are displayed in Table 23.¹⁹

Table 23: Mediating effects of permanent availability and time pressure

estimated relationship	average direct effect (ADE)	average indirect effect (ACME)	total effect (TE)	% of TE mediated
H3a: supervisory responsibility → permanent availability → sickness absenteeism	-1.530*** (0.479)	-0.352*** (0.102)	-1.882*** (0.455)	18.719%
H3b: supervisory responsibility → time pressure → sickness absenteeism	-1.751*** (0.478)	-0.131* (0.075)	-1.882*** (0.457)	6.958%
H4a: supervisory responsibility → permanent availability → sickness presenteeism	0.041* (0.013)	0.022*** (0.003)	0.063*** (0.012)	34.912%
H4b: supervisory responsibility → time pressure → sickness presenteeism	0.051** (0.012)	0.012*** (0.002)	0.063*** (0.012)	19.074%

*Notes: Control variables as in Models M1 and M2 (Table 22); standard errors clustered at the establishment level in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

Looking at the results regarding the effect of supervisory responsibility on sickness absenteeism that is caused by the mediator permanent availability (H3a), the average causal mediation effect was statistically significant and negative (ACME=-0.352, $p < 0.01$). Furthermore, the average direct effect of the treatment was statistically significant and negative as well (ADE=-1.530, $p < 0.01$). In this case, the mediation, i.e., being permanently available, accounted for around 18.7 percent of the total effect of supervisory responsibility reducing sickness absenteeism (TE=-1.882, $p < 0.01$). Thus, in the light of hypothesis 3a, permanent availability partially mediated the effect of supervisory responsibility on sickness absenteeism. Put differently, being permanently available partially caused the reduction of sickness absenteeism. Concerning time pressure, I also identified a partial mediation with a statistically

¹⁹ For brevity, Table 23 only presents the results of the average direct, the average indirect mediation effects as well as the total effects. The results relating to the first step of the mediation analyses as well as to the control variables can be obtained from the author on request.

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significant negative average causal treatment effect (ACME = -0.131, $p < 0.1$). In detail, approximately 7.0 percent of the total effect of supervisory responsibility on sickness absenteeism ran through an employee experiencing time pressure.

Further, I examined the results concerning sickness presenteeism. The average direct effect of supervisory responsibility on sickness presenteeism was statistically significant and positive when considering permanent availability as a mediator (ADE=0.041, $p < 0.1$) and the average causal mediation effect was also statistically significant and positive (ACME=0.022, $p < 0.01$). This infers that there is empirical support for hypothesis 4a, i.e., that permanent availability transmits the effect of supervisory responsibility on sickness presenteeism, at least partially. In line with the theoretical expectations of hypothesis 4b, the results also suggest that time pressure, correspondingly, acts as a partial mediator of the effect of supervisory responsibility on sickness presenteeism (ACME=0.012, $p < 0.01$).

To sum up, the results suggest that the two challenge job demands, permanent availability and time pressure, are partially the causal mechanisms why individuals in a leadership position with supervisory responsibility report fewer sickness absenteeism days respectively engage in sickness presenteeism more often than individuals without supervisory responsibility.

4.4.2 Additional analyses

To provide supplementary support for the theoretical predictions, I present two additional analyses regarding the causal mechanism between supervisory responsibility and sickness absenteeism. First, I want to disclose that the effect of supervisory responsibility in reducing sickness absenteeism was not due to supervisors engaging in sickness presenteeism but because supervisory responsibility improves an employee's health. Therefore, I run a mediation model with an individual's current *health status* as the mediator transmitting the effect of supervisory responsibility on sickness absenteeism. For brevity, Table 24 only presents the results of the average direct, the average indirect mediation effects, and the total effects.²⁰ Concerning the mediation analysis, I analyzed the average effect of the treatment variable on the outcome variable that operates through the mediator, i.e., the average causal treatment effect. The results, which are displayed in Table 24, reveal that the average causal mediation effect (ACME), i.e., the effect of supervisory responsibility that is caused by an individual's current health status, was statistically significant and negative (ACME= -0.450, $p < 0.1$). Additionally, the average direct effect (ADE) of the treatment, i.e., all other causal mechanisms linking supervisory

²⁰ The results relating to the first step of the mediation analyses as well as to the control variables can be obtained from the author on request.

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responsibility to sickness absenteeism, was statistically significant and negative as well (ADE=-1.901, $p < 0.01$). The results of the negative mediation effect of an individual's *health status* indicate that supervisory responsibility, indeed, reduces the number of sickness absenteeism days partially through improving an employee's health.

Also, I estimated another mediation model with sickness presenteeism as the mediator of the relationship between supervisory responsibility and sickness absenteeism (Table 24). However, the corresponding results show that the average causal mediation effect of sickness presenteeism was not statistically significant. This implies that sickness presenteeism is not the causal mechanism for fewer sickness absenteeism days of supervisors. In sum, these results provide additional evidence for the predicted theoretical mechanism of supervisory responsibility reducing sickness absenteeism.

Table 24: Additional analyses regarding the causal mechanism between supervisory responsibility and sickness absenteeism

estimated relationship	average direct effect (ADE)	average indirect effect (ACME)	total effect (TE)	% of TE mediated
supervisory responsibility → health status → sickness absenteeism	-1.901*** (0.419)	-0.450* (0.124)	-2.350*** (0.436)	19.130%
supervisory responsibility → sickness presenteeism (binary) ^a → sickness absenteeism	-2.218*** (0.588)	-0.018 (0.029)	-2.236*** (0.601)	0.786%

*Notes: Control variables as in Models M1 and M2 (Table 22); standard errors clustered at the establishment level in parentheses; ^a sickness presenteeism is treated as a binary variable in this context, taking a value of one if an individual worked while being sick within the last year. This approach is favored because using the propensity of presenteeism, as a constructed measure of sickness absenteeism, is not suitable for explaining sickness absence within the mediation model, and following Demerouti et al. (2009) the absolute number of sickness presenteeism days might be biased due to response errors caused by retrospective recalling; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$*

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

4.4.3 Robustness checks

To lend further support to the empirical results, I conducted several robustness tests. These address alternative model specifications, the hierarchical structure of the data, and the time structure of the dataset. For brevity, Table 25 only presents the results relating to the main variables. The results concerning the control variables accorded with those from the main model and can be obtained from the author on request.

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Table 25: Robustness checks for the analyses on supervisory responsibility and sickness absenteeism respectively sickness presenteeism

	R1	R2	R3	R4	R5	R6
	linear	poisson	multilevel	multilevel	lagged model	lagged model
dependent variable	sickness absenteeism	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness absenteeism _t	sickness presenteeism _t
supervisory responsibility	-1.851*** (0.479)	-0.071*** (0.019)	-0.166*** (0.038)	0.062*** (0.012)		
supervisory responsibility _{t-1}					-0.093* (0.053)	0.052** (0.021)
individual characteristics	yes	yes	yes	yes	yes	yes
job characteristics	yes	yes	yes	yes	yes	yes
establishment characteristics	yes	yes	yes	yes	yes	yes
number of observations	12,676	12,676	12,676	4,945	3,497	1,851
number of individuals	9,179	9,179	9,179	4,262	2,545	1,513
number of establishments	1,216	1,216	1,216	768	623	440
R ² (for R1, R6)/ log (pseudo)-likelihood	0.125	-56,488.472	-40,541.132	-1,622.298	-11,656.490	0.045

Notes: Control variables as in Models M1 and M2 (Table 22); standard errors in parentheses (R1, R5: bootstrapped standard errors with 200 resamples, R3, R4: robust standard errors, R6: standard errors clustered at the establishment level); in R5 and R6 the one-period lag of all control variables is included; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

First, previous research applied (various) different empirical methods when estimating the number of sickness absenteeism days. Therefore, I showed that the results of this study are robust concerning alternative estimation methods. First, I display the results of a linear random-effects model in Model R1 (Table 25). Second, even though I showed that overdispersion is a problem in the present data, I nevertheless followed Leineweber et al. (2017), M. L. Nielsen et al. (2004), and Rugulies et al. (2007) and re-estimated the results of Model M1 from the main analyses using a Poisson model (Table 25, Model R2). All the above alternative model specifications did not change the results qualitatively.

Second, the multisource data set used in this study implies that employees are nested within establishments. It should be considered that corporate culture relating to attendance norms, values, and behaviors differs between establishments and can play an important role when determining sickness absenteeism and presenteeism (Ruhle and Süß, 2020). Therefore, to acknowledge the hierarchical structure of the data and the greater similarity within establishments than between them, I followed Steenbergen and Jones (2002) and conducted a multilevel model. This approach calculates inferences more precisely by explicitly acknowledging that observations are more similar within establishments than between them (Table 25, Models R3 and R4). The findings suggest robust results.

Lastly, sickness absenteeism and sickness presenteeism are measured retrospectively relating to the year leading up to the survey. To account for possible confoundings in the time-series information of the data, I reestimated the results of the main analyses using one-period lags of all independent variables with the results staying qualitatively robust (Table 25, Models R5 and R6).

4.5 Discussion

As it becomes harder for employers to fill leadership positions, it is critical to address the concerns of employees about such positions. Contributing to the ongoing discussion of the literature on health-related outcomes of supervisory responsibility, the present results are informative for several reasons.

First, the results of this study suggest that a leadership position with supervisory responsibility reduces sickness absenteeism. This sheds light on the mixed results of previous research when considering health-related consequences of supervisory responsibility (Boyce and Oswald, 2012; Debus et al., 2019; Fletcher and French, 2021; W.-D. Li et al., 2018; Schieman and Reid, 2009). This article further contributes to research on sickness absenteeism of supervisors by showing that engaging in sickness presenteeism is not the underlying

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mechanism why employees in a leadership position with supervisory responsibility report fewer sickness absenteeism days, but improved health is.

Second, this research contributes to the application of the JD-R model (Demerouti et al., 2001) by inferring that supervisory responsibility, being a job demand and a job resource, reduces sickness absenteeism but increases sickness presenteeism. Moreover, I explicitly focus on the extension of the JD-R model by Crawford et al. (2010) and provide empirical insights into their theoretical differentiation of job demands into challenge and hindrance demands. Correspondingly, I followed the call of Bakker and Demerouti (2017, p. 278) to “uncover the conditions under which job demands act as hindrances versus challenges”. Accordingly, this study illustrates that the two aspects that characterize supervisory responsibility as a challenge job demand, namely being permanently available and the time pressure experienced in the position, partially mediate the relationship of a leadership position with supervisory responsibility and sickness absenteeism respectively sickness presenteeism. Though there has been some discussion on whether time pressure functions as a challenge or a hindrance demand (Abbas and Raja, 2019; Schilbach et al., 2023), I relate to this discussion by showing that time pressure decreases sickness absenteeism but increases sickness presenteeism. Additionally, I relate to previous literature stating that permanent availability via email context acts as a job demand (Steffensen et al., 2022) by arguing that more specifically it acts as a challenge job demand. The results of this study reconcile with the theoretical assertions of Crawford et al. (2010) that challenge demands can also play a motivational and engaging role. This suggests that job demands are not necessarily negative but can also induce a motivational process through opportunities to grow and, therefore, reduce sickness absenteeism. This finding reinforces the importance of differentiating job demands into challenge and hindrance demands. Briefly, the empirical findings supported the theoretical predictions and imply that it is relevant for employers to reflect if a job demand acts as a challenge or a hindrance demand before considering reducing job demands of certain positions because as the results suggest, job demands can also induce positive consequences.

The results of this research also have several practical implications. Taking into account that the costs of absenteeism and sickness presenteeism for organizations are high (Grinza and Rycx, 2020; Johns, 2011), it is relevant for employers to understand how to reduce this behavior. Therefore, this study infers that being in a leadership position with supervisory responsibility does not make employees sick. This is not just pertinent for leaders themselves but also for organizations because having unhealthy leaders can negatively affect an organization's

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performance (Keloharju et al., 2023; Sirén et al., 2018). Employers could, additionally, counteract the negative consequences of sickness presenteeism by reducing the need for permanent availability and the time pressure of supervisors. This may seem ambiguous because the aspects that lead to sickness presenteeism seem to reduce sickness absenteeism. However, this challenges employers to avoid sickness presenteeism among supervisors by not just reducing all job demands of a position but to encouraging their supervisors to be aware of the negative consequences of sickness presenteeism without lowering job demands. Another organization-driven JD-R intervention that is proposed by Bakker and Demerouti (2014) is to train employees to better deal with job demands. Organizations could integrate such training into leadership development programs to improve their leaders' skills to operate under challenging job demands (Harms et al., 2017). Finally, for employees, the results suggest that obtaining a leadership position with supervisory responsibility can reduce sickness absenteeism by improving their own health, which could make obtaining a leadership position more attractive to the young workforce.

Although this research makes several contributions to the literature, this study has some shortcomings that need to be addressed. There is literature that argues that employees with fewer sickness absenteeism days, i.e. better health, are more prone to obtaining supervisory responsibility in the first place (Boyce and Oswald, 2012; Kröger, 2017). To counteract this problem, at least to a certain degree, this study controls for a vast number of individual characteristics, in particular an individual's current *health status*. This minimizes the possibility that the reported relationship is confounded by leaders having privileged health. Nevertheless, I cannot fully preclude endogeneity from the analyses and the empirical results need to be interpreted cautiously with respect to causality.

Another possible limitation might be that this study only focuses on the two challenge job demands permanent availability and time pressure of a leadership position with supervisory responsibility due to data availability. However, future research could investigate additional job demands of leadership positions with supervisory responsibility but specifically differentiate between challenge and hindrance demands. Additionally, this article only focuses on job demands of leadership positions. I, therefore, encourage future research to also identify the effects of job resources that transmit the effect of supervisory responsibility on sickness absenteeism and sickness presenteeism. Finally, the measures of permanent availability and time pressure are both single-item measures, which I note as a constraint of using pre-existing data.

4.6 Conclusion

This article provides evidence that holding a leadership position with supervisory responsibility affects sickness absenteeism and sickness presenteeism through the partial mediation of permanent availability and time pressure. Even though a leadership position with supervisory responsibility reduces the number of sickness absenteeism days, it increases sickness presenteeism behavior. In summary, this study enriches our understanding of the demands of a leadership position with supervisory responsibility and their consequences for labor-market related health behaviors. Comprehending the importance of differentiating job demands of a leadership position with supervisory responsibility into challenge and hindrance demands could help employers mitigate the current difficulty of recruiting and retaining supervisors.

4.7 Appendix

4.7.1 Appendix A²¹

Furthermore, a set of sensitivity analyses deals with the results of the mediation analyses. Imai et al. (2010) assert that it is a key component of causal mediation analysis to state how sensitive the findings are to a potential violation of the key identification assumption, i.e. the sequential ignorability assumption. This assumption of sequential ignorability is satisfied if (a) there are no unobserved pre-treatment covariates that influence both treatment and outcome/mediator and (b) the mediator is independent with respect to the outcome, conditional on the treatment (Imai et al., 2010, p. 310). Even though I included a full set of covariates in the mediation model to make the key assumption of sequential ignorability more credible, I follow the approach of Imai et al. (2010) and conduct a separate sensitivity analysis for each mediation. This procedure determines a sensitivity parameter ρ as the correlation of the error of the mediation model and the error of the outcome model for which the ACME is zero. Put differently, the higher the value of ρ , the more the errors have to correlate for the average causal mediation effect to disappear and, therefore, the less sensitive the results. Appendix A depicts the ACME contingent on ρ for all four mediation effects. The results show that the results for H3b are the most sensitive whereas the results for H4a are the least sensitive to a potential violation of the underlying sequential ignorability assumption.

Table 26: Sensitivity analyses – Average causal mediation effects at different values of ρ

	ρ at which ACME equals zero
H3a: supervisory responsibility → permanent availability → sickness absenteeism	-0.030
H3b: supervisory responsibility → time pressure → sickness absenteeism	-0.019
H4a: supervisory responsibility → permanent availability → sickness presenteeism	0.110
H4b: supervisory responsibility → time pressure → sickness presenteeism	0.102

Notes: Calculations of the sensitivity analyses are based on the mediation analyses in Table 23

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

²¹ I provided this information in the submission to the *Journal of Business and Psychology* as online supporting material.

4.7.2 Appendix B

Table 27: Mediating effects between supervisory responsibility and sickness absenteeism respectively sickness presenteeism (showing the coefficients of all control variables)²²

dependent variable	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness presenteeism	sickness absenteeism	sickness absenteeism
supervisory responsibility	-1.529*** (0.468)	-1.750*** (0.467)	0.041*** (0.012)	0.051*** (0.012)	-1.879*** (0.467)	-2.217*** (0.698)
Mediators						
permanent availability	-0.745*** (0.207)		0.040*** (0.005)			
time pressure		-0.387* (0.213)		0.032*** (0.004)		
health status					-7.294*** (0.376)	
sickness presenteeism (binary)						-0.426 (0.868)
Individual characteristics						
female	0.834 (0.625)	0.996 (0.624)	0.016 (0.014)	0.007 (0.014)	0.967 (0.623)	0.916 (0.956)
age	0.081*** (0.026)	0.079*** (0.026)	-0.002*** (0.001)	-0.002*** (0.001)	0.082*** (0.026)	0.129*** (0.045)
health status	-7.298*** (0.375)	-7.320*** (0.378)	0.004 (0.007)	0.005 (0.007)		-6.674*** (0.563)
extraversion	1.960*** (0.334)	1.901*** (0.333)	-0.008 (0.007)	-0.005 (0.007)	1.894*** (0.332)	1.474*** (0.449)
openness	1.008** (0.411)	1.048** (0.413)	-0.004 (0.008)	-0.005 (0.008)	0.995** (0.411)	1.474** (0.642)

²² This table is not part of the paper submitted to the *Journal of Business and Psychology*.

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dependent variable	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness presenteeism	sickness absenteeism	sickness absenteeism
agreeableness	1.276*** (0.418)	1.283*** (0.416)	-0.032*** (0.009)	-0.028*** (0.009)	1.314*** (0.418)	1.287** (0.600)
neuroticism	0.267 (0.316)	0.316 (0.315)	0.020*** (0.006)	0.016*** (0.006)	0.254 (0.315)	-0.001 (0.417)
conscientiousness	-0.009 (0.524)	0.055 (0.526)	0.060*** (0.010)	0.053*** (0.010)	0.024 (0.527)	0.230 (0.725)
partner in the same household	0.435 (0.648)	0.427 (0.649)	0.013 (0.014)	0.011 (0.014)	0.410 (0.650)	-0.417 (1.053)
number of children	0.566* (0.329)	0.544* (0.330)	-0.003 (0.009)	-0.002 (0.009)	0.550* (0.330)	0.765 (0.497)
size of the household	-0.340* (0.194)	-0.338* (0.194)	-0.001 (0.006)	-0.000 (0.005)	-0.338* (0.194)	-0.428 (0.298)
education (ref.: apprenticeship)						
training college	-0.458 (0.832)	-0.482 (0.833)	0.010 (0.020)	0.009 (0.019)	-0.485 (0.834)	-1.006 (1.363)
technical college	-0.525 (0.570)	-0.555 (0.572)	0.014 (0.013)	0.014 (0.013)	-0.642 (0.569)	-0.816 (0.860)
university degree	-1.978*** (0.552)	-1.946*** (0.565)	-0.025* (0.014)	-0.031** (0.014)	-2.108*** (0.552)	-2.479*** (0.816)
no/other education	5.762** (2.500)	5.691** (2.507)	-0.006 (0.037)	-0.001 (0.036)	5.793** (2.503)	6.397 (4.025)
income	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Job characteristics						
tenure	-0.049* (0.026)	-0.049* (0.026)	0.001** (0.001)	0.001** (0.001)	-0.050* (0.026)	-0.082* (0.042)
part-time	-1.826** (0.786)	-1.938** (0.786)	0.004 (0.016)	0.012 (0.017)	-1.878** (0.786)	-0.775 (1.274)

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dependent variable	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness presenteeism	sickness absenteeism	sickness absenteeism
overtime hours	-0.058 (0.049)	-0.086* (0.047)	0.005*** (0.002)	0.006*** (0.002)	-0.099** (0.047)	-0.109 (0.070)
number of subordinates	-0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.000** (0.000)
physical exertion	0.761*** (0.221)	0.755*** (0.221)	0.004 (0.004)	0.005 (0.005)	0.753*** (0.222)	0.804** (0.340)
bad working environment	0.976*** (0.166)	0.984*** (0.166)	-0.002 (0.004)	-0.003 (0.004)	0.965*** (0.166)	1.159*** (0.260)
work from home	-0.537 (0.473)	-1.088** (0.454)	-0.022 (0.014)	0.004 (0.014)	-1.211*** (0.450)	-0.572 (0.659)
constant	-601.253*** (193.299)	-597.313*** (194.954)	-5.357 (10.289)	-6.748 (10.481)	-596.460*** (193.586)	1093.974* (636.546)
number of observations	12,676	12,676	4,945	4,945	12,676	5,615

Notes: Control variables for firm size, survey wave, and industry included; standard errors clustered at the establishment level in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

Table 28: Robustness checks for the analyses on supervisory responsibility and sickness absenteeism respectively sickness presenteeism (showing the coefficients of all control variables)²³

	R1	R2	R3	R4	R5	R6
dependent variable	linear sickness absenteeism	poisson sickness absenteeism	multilevel sickness absenteeism	multilevel sickness presenteeism	lagged model sickness absenteeism _t	lagged model sickness presenteeism _t
supervisory responsibility	-1.851*** (0.479)	-0.071*** (0.019)	-0.166*** (0.038)	0.062*** (0.012)		
supervisory responsibility _{t-1}					-0.093* (0.053)	0.052** (0.021)

²³ This table is not part of the paper submitted to the *Journal of Business and Psychology*.

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	R1	R2	R3	R4	R5	R6
	linear	poisson	multilevel	multilevel	lagged model	lagged model
dependent variable	sickness absenteeism	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness absenteeism _t	sickness presenteeism _t
Individual characteristics						
female	0.949 (0.681)	0.069 (0.043)	0.077** (0.039)	0.009 (0.014)	0.100 (0.065)	-0.020 (0.024)
age	0.084*** (0.025)	0.002 (0.002)	0.001 (0.002)	-0.002*** (0.001)	-0.006** (0.003)	-0.003*** (0.001)
health status	-7.097*** (0.356)	-0.331*** (0.007)	-0.525*** (0.016)	0.002 (0.007)	-0.268*** (0.022)	0.012 (0.009)
extraversion	1.909*** (0.324)	0.169*** (0.025)	0.127*** (0.021)	-0.005 (0.007)	-0.020 (0.032)	0.018 (0.013)
openness	1.000** (0.412)	0.069** (0.029)	0.072*** (0.025)	-0.004 (0.008)	0.133*** (0.041)	-0.030** (0.014)
agreeableness	1.314*** (0.443)	0.055* (0.031)	0.073*** (0.027)	-0.031*** (0.009)	0.007 (0.044)	-0.022 (0.016)
neuroticism	0.369 (0.336)	0.179*** (0.023)	0.073*** (0.020)	0.022*** (0.006)	0.068** (0.032)	0.021** (0.010)
conscientiousness	0.054 (0.460)	-0.096** (0.038)	-0.029 (0.034)	0.057*** (0.010)	-0.044 (0.052)	0.045** (0.020)
partner in the same household	0.297 (0.639)	-0.007 (0.025)	0.094** (0.041)	0.015 (0.014)	0.293*** (0.072)	-0.021 (0.025)
number of children	0.561* (0.305)	0.060*** (0.015)	0.080*** (0.023)	-0.003 (0.009)	0.087** (0.035)	0.000 (0.014)
size of the household	-0.351 (0.219)	-0.007 (0.009)	-0.041*** (0.014)	-0.000 (0.005)	-0.088*** (0.023)	-0.010 (0.009)
education (ref.: apprenticeship)						
training college	-0.427 (0.895)	-0.059 (0.062)	-0.037 (0.054)	0.006 (0.020)	0.040 (0.092)	-0.001 (0.034)

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	R1	R2	R3	R4	R5	R6
	linear	poisson	multilevel	multilevel	lagged model	lagged model
dependent variable	sickness absenteeism	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness absenteeism _t	sickness presenteeism _t
technical college	-0.820 (0.613)	-0.222*** (0.046)	-0.099** (0.040)	0.022 (0.013)	0.039 (0.067)	-0.021 (0.021)
university degree	-2.237*** (0.557)	-0.435*** (0.048)	-0.312*** (0.043)	-0.018 (0.014)	-0.061 (0.062)	-0.028 (0.023)
no/other education	5.665** (2.348)	-0.008 (0.114)	0.129 (0.110)	-0.014 (0.035)	0.293 (0.211)	-0.057 (0.058)
income	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000* (0.000)
Job characteristics						
tenure	-0.056** (0.024)	-0.003 (0.002)	-0.005*** (0.002)	0.001*** (0.001)	-0.004 (0.002)	0.003*** (0.001)
part-time	-2.074*** (0.776)	-0.180*** (0.027)	-0.159*** (0.053)	0.005 (0.017)	-0.096 (0.091)	0.005 (0.029)
overtime hours	-0.108** (0.046)	-0.017*** (0.002)	-0.011*** (0.004)	0.007*** (0.002)	-0.000 (0.006)	0.006*** (0.002)
number of subordinates	-0.001 (0.003)	-0.001** (0.000)	-0.001** (0.001)	0.000 (0.000)	-0.002 (0.001)	0.000 (0.000)
physical exertion	0.771*** (0.208)	-0.026*** (0.006)	0.056*** (0.013)	0.005 (0.004)	0.051** (0.020)	-0.007 (0.007)
bad working environment	0.968*** (0.168)	0.047*** (0.005)	0.086*** (0.011)	-0.003 (0.004)	0.043*** (0.018)	-0.008 (0.007)
work from home	-1.216** (0.484)	-0.213*** (0.023)	-0.147*** (0.042)	0.017 (0.014)	-0.089 (0.061)	0.057** (0.024)
Establishment characteristics						
establishment size (ref.: small enterprises (10–49))						

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	R1	R2	R3	R4	R5	R6
	linear	poisson	multilevel	multilevel	lagged model	lagged model
dependent variable	sickness absenteeism	sickness absenteeism	sickness absenteeism	sickness presenteeism	sickness absenteeism _t	sickness presenteeism _t
micro enterprises (less than 10)	-6.890* (3.531)	-1.372 (1.313)	-1.329*** (0.219)	0.418*** (0.084)		
medium-sized enterprises (50–249)	-1.298 (2.903)	-0.241** (0.118)	-0.063 (0.163)	0.023 (0.068)	0.168 (0.394)	-0.073 (0.140)
large enterprises (250 and more)	-1.223 (2.800)	-0.273** (0.120)	-0.057 (0.161)	0.012 (0.068)	0.287 (0.400)	-0.080 (0.139)
constant	15.861*** (4.191)	1.794*** (0.254)	2.724*** (0.275)	0.313*** (0.106)	-0.039 (0.539)	0.503*** (0.192)
number of observations	12,676	12,676	12,676	4,945	3,497	1,851
number of individuals	9,179	9,179	9,179	4,262	2,545	1,513
number of establishments	1,216	1,216	1,216	768	623	440
R ² (for R1, R6)/ log (pseudo)-likelihood	0.125	-56,488.472	-40,541.132	-1,622.298	-11,656.490	0.045

Notes: Dummy variables for survey wave and industry included; standard errors in parentheses (R1, R5: bootstrapped standard errors with 200 resamples, R3, R4: robust standard errors, R6: standard errors clustered at the establishment level); in R5 and R6 the one-period lag of all control variables is included; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019

Table 29: Definitions and descriptions of all variables used in the analyses on supervisory responsibility and sickness absenteeism respectively sickness presenteeism²⁴

Variable name (label in Do-File)	Original variable	Dataset	Description
sickness absenteeism (kranktage)	mgesund_kranktage	lpp_employee	self-reported number of days an individual was unable to work in the last year due to illness
sickness presenteeism (sp_propensity)	mgesund_prestage	lpp_employee	self-reported number of days the individual went to work within the last year although they should have stayed at home due to their state of health (= sickness presenteeism days) / (sickness presenteeism days + sickness absenteeism days)

²⁴ This table is not part of the paper submitted to the *Journal of Business and Psychology*.

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Variable name (label in Do-File)	Original variable	Dataset	Description
supervisory responsibility (<i>PV</i>)	mleitung	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual supervises others • 0, otherwise
permanent availability (<i>availability</i>)	maz_freizeit	lpp_employee	measure of how often the individual receives business phone calls during their leisure time or how often they answer business e-mails on a scale from 1 to 5
time pressure (<i>time_pressure</i>)	mbed_stress	lpp_employee	measure of how often the individual feels time pressure at work over a long period or has to deal with several important tasks at the same time on a scale from 1 to 5
female (<i>female</i>)	msex	lpp_employee	<ul style="list-style-type: none"> • 1, if the employee is female • 0, otherwise
age (<i>age</i>)	mgebjahr	lpp_employee	the age of the individual (in years)
health status (<i>gesund</i>)	mgesund_allg	lpp_employee	measure of the individual's self-rated current health status on a scale from 1 to 5
extraversion (<i>Extraversion</i>)	mbig_komm, mbig_gesell, mbig_zur	lpp_employee	measure of the Big Five personality characteristic extraversion on a scale from 1 to 5
agreeableness (<i>Verträglichkeit</i>)	mbig_grob, mbig_verzeih, mbig_freundl	lpp_employee	measure of the Big Five personality characteristic agreeableness on a scale from 1 to 5
conscientiousness (<i>Gewissenhaftigkeit</i>)	mbig_gruend, mbig_faul, mbig_effi	lpp_employee	measure of the Big Five personality characteristic conscientiousness on a scale from 1 to 5
neuroticism (<i>Neurotizismus</i>)	mbig_sorgen, mbig_nervoes, mbig_entsp	lpp_employee	measure of the Big Five personality characteristic neuroticism on a scale from 1 to 5
openness (<i>Offenheit</i>)	mbig_origi, mbig_kunst, mbig_phant, mbig_wissb	lpp_employee	measure of the Big Five personality characteristic openness on a scale from 1 to 5
partner in the same household (<i>partner_haushalt</i>)	mpartner, mpartner_hh	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual has a partner who lives in the same household • 0, otherwise
number of children (<i>Kinder</i>)	mkind_anz, mhhgroesse, mpartner_hh	lpp_employee	the number of children under 14 years that live within the household
size of the household (<i>haushaltsgroesse</i>)	mhhgroesse	lpp_employee	the number of individuals that live in the same household

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Variable name (label in Do-File)	Original variable	Dataset	Description
educational level (Ausbildung)	mausb	lpp_employee	
apprenticeship (Lehre)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is an apprenticeship • 0, otherwise
training college (Beruflich_schulisch)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a training college • 0, otherwise
technical college (Fachschule)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a technical college • 0, otherwise
university degree (Fach_Hochschulabschluss)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a university degree • 0, otherwise
no/other education (keine_andere_Ausbildung)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is other or no education • 0, otherwise
income (mnetto)	mbrutto	lpp_employee	the individual's gross income per month (in €)
tenure (tenure)	jahr, eintritt	Integrated Employment Biographies	length of time an individual has been employed by the current employer (in years)
part-time (Teilzeit)	maz_voll_teil	lpp_employee	<ul style="list-style-type: none"> • 1, if the individual works part-time • 0, otherwise
overtime hours (overtime)	maz_gesamt, maz_vertrag	lpp_employee	the difference between the total working hours and the contractual working hours of an employee (in hours)
number of subordinates (Menge_PV)	mleitung_anz, mleitung	lpp_employee	the number of subordinates an individual supervises
work from home (homeoffice)	mheim	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual is working from home • 0, otherwise
physical exertion (physical_work)	mbed_kraft	lpp_employee	measure of how much physical effort an individual's job requires on a scale from 1 to 5

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Variable name (label in Do-File)	Original variable	Dataset	Description
bad working environment (<i>bad_environment</i>)	mbed_umgeb	lpp_employee	measure of how exposed an individual is to unpleasant ambient conditions such as noise, extreme temperature, unpleasant lightning or odors in their job on a scale from 1 to 5
establishment size (<i>Betriebsgröße_kategorial</i>)	t30ges, v25ges, x26ges, z27ges	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if the establishment has 1–9 employees (micro enterprises) – not in the sample • 2, if the establishment has 10–49 employees (small enterprises) • 3, if the establishment has 50–249 employees (medium-sized enterprises) • 4, if the establishment has 250 and more employees (large enterprises)
survey wave (<i>jahr</i>)	YEAR	IAB Establishment Panel	<ul style="list-style-type: none"> • 2012: wave 1 (2012/2013) • 2014: wave 2 (2014/2015) • 2016: wave 3 (2016/2017) • 2018: wave 4 (2018/2019)
state (<i>Bundesland</i>)	bula2012, bula2014, bula2016, bula2018	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if state is Schleswig-Holstein • 2, if state is Hamburg • 3, if state is Lower Saxony • 4, if state is Bremen • 5, if state is North Rhine-Westphalia • 6, if state is Hesse • 7, if state is Rhineland-Palatinate • 8, if state is Baden-Württemberg • 9, if state is Bavaria • 10, if state is Saarland • 11, if state is Berlin • 12, if state is Brandenburg • 13, if state is Mecklenburg Western Pomerania • 14, if state is Saxony • 15, if state is Saxony-Anhalt • 16, if state is Thuringia

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Variable name (label in Do-File)	Original variable	Dataset	Description
industry (<i>Branche15</i>)	t89b, v89b, x89b, z91b	IAB Establishment Panel	<ul style="list-style-type: none"> • 2, if industry is mining and quarrying • 3, if industry is electricity, gas and water supply, water and scrap, disposal, recycling • 4, if industry is manufacturing • 5, if industry is construction • 6, if industry is trade • 7, if industry is transport and storage • 8, if industry is information, communication • 9, if industry is accommodation and food services • 10, if industry is financial and insurance services • 11, if industry is business support, scientific and other professional services • 12, if industry is education • 13, if industry is human health and social work • 14, if industry is other services • 15, if industry is non-profit organizations, public administration
persnr (<i>persnr</i>)	persnr	lpp_employee	unique individual identification number
idnum (<i>idnum</i>)	idnum	lpp_employee, lpp_employer, IAB Establishment Panel	unique establishment identification number

On an ego trip: The relationship between supervisory responsibility and leader altruism

Stephanie Funk²⁵

This manuscript is under review at the *International Journal of Manpower*; status: revise and resubmit.

Abstract: Purpose – Prominent corporate scandals involving companies like Wirecard, Enron, VW, and Tyco underscore the corrupting influence of power, with leaders often engaging in antisocial behaviors. Provoked by this, this study investigates the relationship between supervisory responsibility and altruistic behavior. Understanding the dynamics of how structural power, particularly supervisory responsibility, affects altruistic behavior over time is essential for organizations, given the well-documented advantages of altruistic leaders in terms of performance, innovation, or ethical leadership.

Approach – Drawing upon the approach-inhibition theory of power, this article proposes that individuals with greater structural power in terms of prolonged duration and greater scope of supervisory responsibility will show a decline in altruistic behavior. Following theoretical considerations, power influences leaders' behavior by decreasing attentiveness, reducing empathy, and increasing self-focus. The study uses recent German linked employer-employee data to test the relationship between supervisory responsibility and leader altruism (n=2,752).

Findings – The results support that a prolonged duration and a greater scope of supervisory responsibility correlate negatively with leaders' altruistic behavior.

Originality/value – The research empirically validates the findings on behavioral consequences of structural power from experimental settings for organizational leaders by explicitly focusing on the duration and the scope of supervisory responsibility. The findings provide useful insights for organizations concerning leader selection and leader governance mechanisms.

Keywords: supervisory responsibility, leadership, altruism, egoism

²⁵ The data access was provided via on-site use at the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access.

5 On an ego trip: The relationship between supervisory responsibility and leader altruism

5.1 Introduction

Wirecard, Enron, VW, or Tyco are just a few of the names included in high-profile corporate scandals, providing anecdotal evidence of the corrupting influence of power. This influence often leads individuals to exploit others, enrich themselves, and engage in antisocial behaviors. However, having more moral leaders is not only essential to the merit of society but also for achieving sustainable organizational success (Lemoine et al., 2019). Above all, organizations should be particularly interested in having altruistic leaders, as research indicates that such leaders increase performance (Barghouti et al., 2023; Mallén et al., 2015; Melis and Nawaz, 2023), foster innovation (Domínguez Escrig et al., 2016), enhance organizational learning (Guinot et al., 2016), promote ethical leadership (Haar et al., 2019), and contribute to greater workplace happiness (Boddy and Taplin, 2016; Salas-Vallina and Alegre, 2018). Additionally, altruism as one dimension of organizational citizenship behavior contributes to an organization's overall effectiveness (Kim, 2006). Concerning individual consequences, previous literature found that the power leaders have can motivate both positive and negative behavior (Foulk et al., 2020) but the precise relationship between power and different moral behaviors remains unclear (Bendahan et al., 2015). While power typically stems from an individual's organizational position and personal characteristics (Ladkin and Probert, 2021), this study specifically focuses on supervisory responsibility as a form of structural power, which is the power coming from an individual's position within an organizational hierarchy.

Based on the approach-inhibition theory of power (Keltner et al., 2003), I posit that individuals possessing greater structural power, characterized by longer duration and a greater scope of supervisory responsibility, tend to exhibit behavior characterized by diminished attentiveness, reduced empathy, and increased self-focus, which leads to a decline in altruistic behavior. Therefore, to investigate the moral behavior of leaders within an organization, this study delves into the association of supervisory responsibility and leader altruism, as one dimension of moral behavior. In particular, this study explores the roles of both the duration and the scope of supervisory responsibility in shaping these dynamics.

Based on recent linked employer-employee data from Germany, the results suggest that extended durations in leadership positions and an increased scope of supervisory responsibility diminish leaders' levels of altruism. A more profound comprehension of the question of how structural power, particularly supervisory responsibility, shapes altruistic behavior over time

may help organizations in predicting leaders' behavior to adequately shape leader selection and leader governance mechanisms more effectively.

This research contributes to the literature in two key dimensions. There have been discussions in the literature on the relationship between (the sense of) power and selfish or pro- and antisocial behavior (Bendahan et al., 2015; Cai and Liu, 2019; Cremer and van Dijk, 2005; DeCelles et al., 2012; Dubois et al., 2015; Foulk et al., 2018; Giurge et al., 2021; Handgraaf et al., 2008; van Kleef et al., 2008). Whereas these studies explore the psychological experience of power in controlled laboratory settings and not in the employment context, I complement this literature by focusing on structural power, i.e., having supervisory responsibility over time and the actual scope of supervisory responsibility, prevalent in organizational settings. While psychological power refers to feeling powerful, structural power entails actual control over valuable resources (Tost and Johnson, 2019). This distinction is crucial, as leaders in real hierarchical settings must navigate numerous responsibilities (Giurge et al., 2021) and competing cognitive demands (Schmid Mast et al., 2009), making it imperative to move beyond the mere contemplation of power or the recalling of past events of power which significantly differs from real structural power (Flynn et al., 2011). By scrutinizing the generalizability of findings from experimental settings and psychological power studies to actual leadership positions with supervisory responsibility in the field, this research enhances the external validity of these conclusions (Rus et al., 2010). This, in turn, provides valuable insights for organizations when adjusting their leadership governance mechanisms in order to monitor the behavior of specific leaders more closely.

Furthermore, this article contributes to the existing literature by addressing the temporal dimension of the relationship between structural power and leaders' behavioral patterns. Previous research conducted in controlled experimental settings dedicated little attention to time-scaling, which differs significantly from real-life organizational scenarios (Berger et al., 2020). While Bendahan et al. (2015) attempted to incorporate a time dimension through a two-period game within their laboratory contexts, this does not capture prolonged timespans characterizing leadership positions. Given that supervisors typically occupy their leadership positions over multiple years and organizations rarely revoke their decision on supervisory responsibility once granted, it is relevant to explore the long-term dynamics of supervisory responsibility and its influence on leader altruism within organizational contexts. Briefly, this research not only advances our understanding of structural power and its connection with leader behavior by scrutinizing supervisory responsibility and its scope on leader altruism but also

enriches our insights into how this relationship evolves over extended periods in real-world settings.

This paper proceeds as follows. The next section provides a brief discussion of previous literature and describes the theoretical background deriving the hypotheses of this paper. I describe the German linked employer-employee dataset, the variables, and the empirical strategy that I use for the empirical analyses in the proceeding section. In the following, I present the estimation results, which support the predicted relationships. This section is followed by a discussion section, where I discuss the results, their robustness, potential implications, and limitations. Finally, the last section concludes.

5.2 Literature and hypotheses development

As already stated above, structural power in the workplace predominantly emanates from their organizational positions (Ladkin and Probert, 2021). Correspondingly, this article focuses on supervisory responsibility as a facet of structural power within organizational contexts. Therefore, this study builds upon existing research concerning structural power and leaders' behavioral patterns that argue that power fosters self-interest (Burke, 2006), induces the perception that the less powerful are less worthy, and increases prejudice (Bendahan et al., 2015). Bendahan et al. (2015) intended to construct structural power within experimental settings, whereas Tost and Johnson (2019) and Wisse and Rus (2012) investigated the relationship between power and solidarity respectively self-interested behavior within an organizational context. Although Tost and Johnson (2019) found that power induces feelings of solidarity, they did not find any impact of supervisor tenure on behavioral solidarity. The same is true for the study of Wisse and Rus (2012) concerning power and leader self-interested behavior. Additionally, even though both articles limit their studies to supervisors, they rely on self-rated power measures and do not quantify structural power objectively within an organizational setting. Moreover, in the context of organizations, Rus et al. (2010) examined the associations between structural power and self-serving behavior among leaders building on the approach-inhibition theory of power by Keltner et al. (2003).

I follow the line of argumentation of Rus et al. (2010) to develop the theoretical argument for why supervisory responsibility reduces altruistic behavior. The approach-inhibition theory of power (Keltner et al., 2003) claims that individuals with varying levels of power exhibit distinct behavioral patterns within the same social environment. Low-power individuals tend to express inhibition-related behavior, as they carefully attend to others to navigate more threatening social environments (Keltner et al., 2003). Conversely, high-power individuals tend

to display behavior characterized by approach-related tendencies because the experience of power is associated with elevated self-esteem and a sense of independence and freedom (Keltner et al., 2003; Kipnis, 1972). When individuals feel independent of others, they focus more on pursuing their own interests and goals (Tost and Johnson, 2019). This shift in behavior is associated with powerholders being less attentive and responsive to others' needs (Keltner et al., 2003; Tost and Johnson, 2019). With an increasing scope of power, individuals also experience difficulty in empathizing with others and focus less on the psychological experiences of those around them (Galinsky et al., 2006). Consequently, those in power maintain greater psychological distance from the less powerful (Kipnis, 1972), inhibit their compassion for others (Kipnis, 1976), and show an egocentric orientation to social encounters (Blader and Chen, 2012), sometimes even enacting in socially inappropriate ways (Keltner et al., 2003).

Considering scenarios within organizational structures, one specific form of power are leadership positions with supervisory responsibility because individuals in such positions hold authority and decision-making power over others. When I transfer the observed behavior patterns associated with power to leadership positions with supervisory responsibility, I claim that the decreased attentiveness to others, the reduced empathy, and the increased focus on personal goals and desires – all associated with the inhibition of structural power – contribute to a decline in altruistic behavior.

Two directions emerge from this line of argumentation: First, when individuals become manifested in their positions of power, their behavior associated with this structural power, and therefore supervisory responsibility, does not change immediately when obtaining a leadership position with supervisory responsibility but rather evolves over time. Consequently, I propose that the impact of supervisory responsibility on altruistic behavior will be a gradual change that occurs over the duration of holding such a position. This leads to the following hypothesis:

Hypothesis 1 (H1): The duration of having supervisory responsibility is negatively related to leader altruism.

Second, not only the duration of being in a leadership position with supervisory responsibility but also how much supervisory responsibility an individual has matters. Previous research has provided only limited insights into the influence of the scope of power referring to the number of subordinates on leaders' behavioral patterns. Rus et al. (2010) reported no significant association between the number of subordinates and self-serving behavior among leaders. In contrast, Bendahan et al. (2015) suggested that an increase in the scope of power induces corruptive behavior and Giurge et al. (2021) contended that increased power could lead

to a decline in principled moral reasoning, both owing to enhanced self-interest among leaders. I follow this existing literature and assert that the more supervisory responsibility individuals have, the more powerful they feel. With this increasing scope of structural power, they develop the above-mentioned behavior more profoundly: they become more self-focused, less attentive, and less empathic to others which ultimately results in decreased altruistic behavior. I, therefore, advance the following hypothesis:

Hypothesis 2 (H2): The scope of supervisory responsibility is negatively related to leader altruism.

5.3 Methods

5.3.1 Sample

For the empirical analyses, this study utilizes data from the Linked Personnel Panel (LPP) (Ruf, Mackeben, Grunau, and Wolter, 2020; Ruf et al., 2022) a distinctive dataset provided by the German Institute of Employment Research (IAB). The LPP data is representative of German private-sector establishments with a workforce of at least 50 employees subject to social security contributions. The data collection consisted of five waves conducted in the years 2012/2013, 2014/2015, 2016/2017, 2018/2019, and 2020/2021. These waves are based on surveys conducted with both, employees and their employers, resulting in the availability of a linked employer-employee dataset. Since the dependent variable of *altruism* is only observed from wave 2 onwards, I restrict the sample to the last four waves. Additionally, I merge the LPP data with the IAB Establishment Panel to acquire additional structural information about the establishments, such as their industry and the state where they are located.

To test the theoretical predictions, I restrict the sample to employees aged 67 or younger, in line with the statutory retirement age in Germany. Furthermore, to counteract the argument of less altruistic individuals selecting into leadership positions with supervisory responsibility (Bendahan et al., 2015), I limit the sample to individuals in leadership positions with supervisory responsibility. After implementing these steps, the final sample comprises 2,752 individuals in leadership positions with supervisory responsibility employed by 904 employers.

5.3.2 Measures

I measure the dependent variable *altruism* with employees' self-rated willingness to share with others without expecting anything in return on a scale from 0 (no willingness to share) to 10 (high willingness to share). This measure is observed whenever the individual enters the sample starting from wave 2 onwards.

To quantify the *duration of supervisory responsibility*, I use the question “For how many years have you been in charge of other persons regardless of your current position?” which is a follow-up question for individuals who claim to supervise others. I operationalize the main independent variable, the *duration of supervisory responsibility*, as a continuous measure that reflects the number of years an individual has held a leadership position with supervisory responsibility. To measure the *scope of supervisory responsibility*, I utilize the question “How many people work under your direction?” which is also a follow-up question for individuals who supervise at least one person. The variable is a continuous measure of the number of individuals an employee supervises.

Additionally, several other factors influence both, the duration respectively the scope of supervisory responsibility, and an individual’s altruistic behavior. Thus, I follow the literature on altruism and control for personal as well as situational factors (Andreoni and Vesterlund, 2001; Babalola et al., 2023; Dargan and Schermer, 2022; Furnham et al., 2016; Loi et al., 2011; Nakavachara, 2018; Oda et al., 2014). Since personal attributes shape an individual’s behavior, I include various personal characteristics, in particular, whether an individual is *female*, their *age*, the *number of children* below the age of 14 that live within their household, their personality using the *Big Five personality characteristics*, their willingness to take risks, and five dummy variables indicating an individual’s *education level*. Further, within this group, I control whether the individual is born in *Germany* to capture any cultural differences in altruistic behavior. Situational factors comprise whether an individual has a *permanent contract* to represent job (in)security, 15 industry dummy variables to capture any selection effects into specific industries, and 16 state dummies to control for historic or financial regional differences in altruistic behavior. Finally, to control for time effects, I add a dummy variable for each survey wave.

5.3.3 Estimation strategy

To capture the effect of the duration and the scope of supervisory responsibility on altruism, I estimate a pooled ordinary least squares (OLS) model. Because altruism is only measured once employees enter the survey, there is no variation in altruism within individuals over time. Therefore, I use the time structure of the data implicitly: I do not estimate the incident of occupying a leadership position with supervisory responsibility on altruism over various years. Instead, I analyze how supervisory responsibility correlates with the level of altruism over time by comparing altruism between individuals with different durations in positions with supervisory responsibility, solely relying on variation in altruism between individuals. To

account for correlations within establishments, as multiple individuals are drawn from the same employer, I cluster standard errors at the establishment level.

5.4 Results

Table 30 provides descriptive statistics for all study variables, whereas Table 31 presents correlations among the variables of interest. Notably, the altruism scores reveal a mean of 7.7 out of a maximum of 10. Moreover, the descriptive statistics highlight that individuals within the sample have accumulated on average 11.8 years of experience in leadership positions with supervisory responsibility, regardless of employer changes. These leaders are mostly male, comprising 83% of the sample and, on average, supervise 24.2 employees.

Table 30: Descriptive statistics of all variables included in the analyses on supervisory responsibility and altruism

	Mean	SD	Min	Max
Main variables				
altruism	7.651	1.506	0	10
duration of supervisory responsibility	11.771	8.956	0.5	44
scope of supervisory responsibility	24.183	104.014	1	3120
Control variables				
female	0.170	–	0	1
age	47.487	9.427	20	67
number of children	0.481	0.802	0	5
extraversion	3.713	0.740	1	5
agreeableness	3.993	0.567	1.667	5
conscientiousness	4.365	0.474	2.667	5
neuroticism	2.597	0.736	1	5
openness	3.690	0.600	1	5
risk-seeking	5.851	1.839	0	10
education				
apprenticeship	0.331	–	0	1
training college	0.065	–	0	1
technical college	0.287	–	0	1
university degree	0.305	–	0	1
no/other education	0.012	–	0	1
country of birth: Germany	0.940	–	0	1
permanent contract	0.976	–	0	1

Notes: $N(\text{individuals})=2,752$, $N(\text{establishments})=904$

Source: Own calculations based on data from the LPP 2014–2021 and the IAB Establishment Panel 2014–2021

Table 31: Correlation matrix of the main variables included in the analyses on supervisory responsibility and altruism

	(1)	(2)	(3)
(1) altruism	1.000		
(2) duration of supervisory responsibility	-0.059**	1.000	
(3) scope of supervisory responsibility	-0.031	0.066***	1.000

Notes: $N(\text{individuals})=2,752$, $N(\text{establishments})=904$; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2014–2021 and the IAB Establishment Panel 2014–2021

Turning to Table 31, the duration of supervisory responsibility is statistically significantly negatively correlated to leader altruism as expected ($p < 0.05$), whereas the correlation coefficient between the scope of supervisory responsibility and leader altruism is not statistically significant.

To test the relationship between supervisory responsibility and leader altruism, I examine the results of the OLS estimations displayed in Table 32. The results concerning the *duration of supervisory responsibility* (hypothesis 1) reveal a statistically significant negative regression coefficient as depicted in models M1 and M2 of Table 32 (M2: $\beta = -0.011$, $p < 0.05$). These results indicate empirical support for hypothesis 1, suggesting that altruistic tendencies tend to diminish as individuals spend more time in a leadership position with supervisory responsibility. Specifically, for each additional year of experience in a leadership position with supervisory responsibility, the results suggest a decline of around 0.011 points on the altruism scale, which ranges from 0 to 10. This might seem very small but considering a mean duration of 11.8 years of supervisory responsibility (Table 30), this sums up to 0.13 points on the altruism scale and underlines the magnitude of the potential impact of prolonged leadership positions on altruistic behavior.

Table 32: Ordinary least squares estimations of leader altruism

	M1	M2	M3	M4
duration of supervisory responsibility	-0.011** (0.004)	-0.011** (0.005)		
scope of supervisory responsibility ^a			-0.005* (0.003)	-0.005** (0.003)
female (ref.: male)	0.209*** (0.072)	0.152* (0.078)	0.223*** (0.072)	0.162** (0.078)
age ^a	0.065* (0.038)	0.061 (0.039)	0.005 (0.033)	0.004 (0.033)
number of children	0.019 (0.038)	0.013 (0.038)	0.025 (0.038)	0.018 (0.038)
extraversion	0.165*** (0.047)	0.165*** (0.047)	0.164*** (0.047)	0.163*** (0.047)
agreeableness	0.389*** (0.054)	0.385*** (0.055)	0.397*** (0.054)	0.391*** (0.056)
conscientiousness	0.040 (0.064)	0.037 (0.064)	0.038 (0.064)	0.036 (0.065)
neuroticism	0.014 (0.040)	0.024 (0.040)	0.014 (0.040)	0.025 (0.040)
openness	0.248*** (0.053)	0.244*** (0.053)	0.246*** (0.053)	0.243*** (0.054)
risk-seeking	0.066*** (0.017)	0.067*** (0.017)	0.065*** (0.017)	0.066*** (0.017)

	M1	M2	M3	M4
education (ref.: apprenticeship)				
training college	0.006 (0.113)	-0.013 (0.115)	-0.002 (0.113)	-0.021 (0.115)
technical college	-0.061 (0.074)	-0.058 (0.075)	-0.086 (0.073)	-0.081 (0.075)
university degree	-0.155** (0.069)	-0.172** (0.071)	-0.161** (0.069)	-0.179** (0.071)
no/other education	-0.288 (0.327)	-0.384 (0.338)	-0.290 (0.331)	-0.388 (0.342)
country of birth: Germany (ref.: all other countries)	-0.277** (0.117)	-0.290** (0.120)	-0.299** (0.117)	-0.309** (0.120)
permanent contract (ref.: fixed-term)	0.056 (0.161)	0.059 (0.155)	0.042 (0.161)	0.048 (0.155)
constant	4.015*** (0.451)	4.027*** (0.469)	4.213*** (0.455)	4.212*** (0.470)
survey wave dummies	yes	yes	yes	yes
industry fixed effects	no	yes	no	yes
state fixed effects	no	yes	no	yes
number of observations/employees	2,752	2,752	2,752	2,752
adjusted R ²	0.071	0.071	0.069	0.070

Notes: $N(\text{establishments}) = 904$; standard errors clustered at the establishment level in parentheses;

^a coefficient and standard error multiplied by 10; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the LPP 2014–2021 and the IAB Establishment Panel 2014–2021

Regarding hypothesis 2, which postulates a negative association between the scope of supervisory responsibility and altruistic behavior, the relevant findings are presented in columns 3 and 4 of Table 32. As shown, the coefficient of the *scope of supervisory responsibility* is statistically significant and negative (M4: $\beta = -0.0005$, $p < 0.05$). In alignment with the theoretical underpinnings, the number of subordinates under a leader's supervision is negatively correlated with leader altruism. These results provide supportive evidence in favor of the prediction that more supervisory responsibility, i.e., more structural power, tends to induce reduced levels of altruistic behavior among leaders.

5.5 Discussion

5.5.1 Contributions and practical implications

Building on the approach-inhibition theory of power by Keltner et al. (2003), this study provides insights into the relationship between the duration respectively the scope of supervisory responsibility, and leader altruism. Consistent with the theory, the results of the empirical analyses indicate that the longer individuals occupy leadership positions with

supervisory responsibility the less altruistic they become. The same is suggested when reflecting on the scope of supervisory responsibility, represented by the number of subordinates an individual supervises. With these results, this article relates and contributes to the literature in two ways. First, it relates to the literature on power respectively the sense of power and various selfish or pro- and antisocial behaviors (Bendahan et al., 2015; Cai and Liu, 2019; Cremer and van Dijk, 2005; DeCelles et al., 2012; Dubois et al., 2015; Foulk et al., 2018; Giurge et al., 2021; Handgraaf et al., 2008; van Kleef et al., 2008), mostly conducted in experimental settings. Consistent with this previous research, the study's findings support the view that the more powerful individuals become, the more egoistic, i.e., the less altruistic they behave. In contrast to previous research, this study goes beyond the laboratory settings and uses rich employer-employee data to validate the results found in the laboratory setting in the corporate context. In doing so, I not only use data from the field, which has previously only been undertaken in a relatively small sample by Rus et al. (2010), but I also shift the focus from the perception of power to structural power, representing the power given by an organizational hierarchy and the position an individual occupies. These considerations strengthen the practical implications derived from experimental settings, extending their relevance to the corporate domain. Given that altruistic leaders, among others, enhance performance (Melis and Nawaz, 2023), increase innovation (Domínguez Escrig et al., 2016), and improve organizational learning (Guinot et al., 2016), the findings serve to enhance the evaluation and selection of prospective leaders, underscoring the importance of organizations choosing their leaders based on moral values, such as their altruistic conduct, as a means to foster responsible and ethical leadership within their organization (Haar et al., 2019).

Second, the present research extends these findings from prior literature by additionally introducing a temporal dimension. It demonstrates that the prolonged duration of supervisory responsibility reduces leader altruism over time. Investigating these enduring dynamics of supervisory responsibility and its impact on leader altruism within organizational settings is relevant, taking into account that supervisors commonly maintain their leadership positions for extended periods. Given the documented benefits of having altruistic leaders, organizations should factor in this aspect when crafting their leadership governance strategies to effectively oversee their leaders, especially those with long-term tenures to ensure they remain aligned with the organization's objectives.

5.5.2 Robustness, limitations, and future directions

To demonstrate the validity of the empirical results, I present several robustness checks in Table 33. For brevity, Table 33 only presents the results relating to the main variables. The results concerning the control variables accord with those from the main models and can be obtained from the author on request.

First, due to the data collection process, multiple employees are drawn from various establishments. As a result, this study compares supervisors from different establishments with each other. Considering that corporate ethical values differ between establishments and may, in consequence, influence altruistic behavior differently between establishments (Valentine et al., 2011), I explicitly account for this hierarchical structure of the data. Thus, I reestimate models M2 and M4 using a multilevel approach following Steenbergen and Jones (2002). This approach offers more accurate inferences by explicitly recognizing that observations tend to be more alike within workplaces than across them. As the results of Models R1 and R2 in Table 33 show, the outcomes of these multilevel analyses indicate consistent findings.

Second, from a theoretical perspective, it could be interesting to know whether the duration and the scope of supervisory responsibility are complementary or function as independent factors. Thus, I conducted an analysis incorporating both, the duration and the scope of supervisory responsibility, within a single model (Table 33, Model R3). Since both coefficients continue to be statistically significant and negative, the results point towards a complementary effect between both facets of having structural power in the workplace and leader altruism.

Furthermore, sample selection bias could be an issue in the present analyses. If unobservable characteristics influence both, a leader's level of altruism and their chances to occupy a leadership position with supervisory responsibility, the observed sample may be endogenous and no longer representative of the underlying population (Heckman, 1979). In line with Bendahan et al.'s (2015) argument that corrupt individuals select into positions of power, it seems plausible that individuals who inherently exhibit lower levels of altruism may intentionally seek leadership positions with supervisory responsibility. To reduce this bias, I limited the sample of the main analyses to supervisors only. To further address this potential bias stemming from non-random selection into such positions, I follow Bendahan et al.'s (2015) recommended solution and employ Heckman's (1979) two-step approach (Table 33, Models R4, R5). In the first stage of this approach, I estimate a probit selection equation for a binary dependent variable identifying selection into a leadership position with supervisory responsibility. To mitigate collinearity concerns, I added four additional variables into this first-stage estimation: I include vigor, dedication, absorption – as a measure of personality and

engagement – and commitment given that these factors influence the occupancy of leadership positions with supervisory responsibility (Deschacht, 2017; W.-D. Li et al., 2015; Schuh et al., 2014). Notably, the results suggest statistically significant effects for dedication and commitment in the first stage, affirming the validity of the identifying assumption within this framework.

Next, I follow Heckman (1979) and incorporate the estimated probabilities from the first stage as inverse Mill's ratio λ_i into the second stage of the regression model, which predicts leader altruism. This approach ensures that the outcome regression considers the potential impact of selection into leadership positions with supervisory responsibility. The results from the second stage suggest that even after accounting for this selection bias, the effects from the main models do not change.

Last, the dependent variable altruism is slightly left-skewed. To account for this non-normal distribution, I use the natural logarithm of the sum of one plus altruism as an alternative operationalization of the dependent variable altruism (Table 33, Model R6, R7). The findings of the analyses concerning the alternative specification reveal robust results.

Nevertheless, the present study has some limitations that future research should address. First, the assessment of altruism in this study relies on self-reporting and does not exclusively focus on altruism in the work context. An alternative approach might involve considering subordinates' evaluations of their leaders' level of altruism similar to the approach employed by Bell and Hughes-Jones (2008) in their study on moral behavior. This could provide valuable insights to validate the current results from a different perspective.

Second, another limitation of the present study is its (pooled) cross-sectional nature, which restricts the ability to establish causal relationships due to temporal ambiguity. Given that altruism is only observed upon an individual's entry into the sample, it is not possible to assess changes in altruism within individuals over time. Despite the effort to account for the temporal aspect in the analyses of the duration of supervisory responsibility by considering the accumulated years in such positions, the examination of the scope of supervisory responsibility lacks the use of any time structure. Therefore, the results should be interpreted as correlations. Future research could engage in replicating the analyses with a longer panel which would be instrumental in identifying the causal effect of how altruism evolves over time.

5.6 Conclusion

In summary, this research explores the connection between structural power, specifically supervisory responsibility, and leader altruism in organizational contexts.

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Table 33: Robustness checks for the estimations of leader altruism

	R1	R2	R3	R4	R5	R6	R7
	multilevel	multilevel	linear	heckman	heckman	log-lin	log-lin
duration of supervisory responsibility	-0.011** (0.004)		-0.010** (0.004)	-0.011*** (0.004)		-0.002** (0.001)	
scope of supervisory responsibility ^a		-0.005** (0.003)	-0.005* (0.003)		-0.005* (0.003)		-0.0008** (0.0004)
constant	4.006*** (0.468)	4.194*** (0.468)	4.039*** (0.469)	4.963*** (0.659)	5.133*** (0.657)	1.726*** (0.064)	1.758*** (0.066)
Heckman selection equation							
vigor				-0.017 (0.027)	-0.017 (0.027)		
dedication				0.172*** (0.028)	0.172*** (0.028)		
absorption				-0.016 (0.025)	-0.016 (0.025)		
commitment				0.025*** (0.003)	0.025*** (0.003)		
constant				-1.845*** (0.275)	-1.845*** (0.275)		
inverse mill's ratio λ_i				-0.551*** (0.192)	-0.548*** (0.192)		
control variables (as in M2, Table 32)	yes	yes	yes	yes	yes	yes	yes
survey wave dummies, industry fixed effects, state fixed effects	yes	yes	yes	yes	yes	yes	yes
number of observations/individuals	2,752	2,752	2,752	11,747	11,747	2,752	2,752
log-pseudo-Likelihood (R1, R2, R6, R7), adjusted R ² (R3), chi ² (R4, R5)	-4,903.928	-4,905.724	0.072	259.078	254.906	535.590	532.122

Notes: R1, R2: $N(\text{establishments}) = 904$; R4, R5: $N(\text{selected}) = 2,719$, $N(\text{non-selected}) = 9,028$; standard errors clustered at the establishment level in parentheses;

^a coefficient and standard error multiplied by 10; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2014-2021 and the IAB Establishment Panel 2014-2021

Unlike previous studies in controlled laboratory settings, this research focuses on rich observational employer-employee data. It also considers the temporal aspect, examining how supervisory responsibility influences leader altruism over extended periods. The empirical analysis shows that supervisory responsibility negatively correlates with a leader's level of altruism. To be more specific, the results indicate that the duration in a leadership position with supervisory responsibility as well as the scope of supervisory responsibility lead to a decline in a leader's level of altruism. Thus, this study enriches our understanding of long-term leader altruistic behavior and as altruistic leaders benefit organizations in various ways (e.g., Guinot et al., 2016; Melis and Nawaz, 2023), highlights the importance of engaging in behavioral leadership research in the future.

5.7 Appendix

Table 34: Robustness checks for the estimations of leader altruism (showing the coefficients of all control variables)²⁶

	R1	R2	R3	R4	R5	R6	R7
	multilevel	multilevel	linear	heckman	heckman	log-lin	log-lin
duration of supervisory responsibility	-0.011** (0.004)		-0.010** (0.004)	-0.011*** (0.004)		-0.002** (0.001)	
scope of supervisory responsibility ^a		-0.005** (0.003)	-0.005* (0.003)		-0.005* (0.003)		-0.0008** (0.0004)
female (ref.: male)	0.156** (0.078)	0.166** (0.078)	0.147* (0.078)	0.330*** (0.104)	0.339*** (0.104)	0.019* (0.010)	0.021** (0.010)
age ^a	0.006 (0.004)	0.000 (0.003)	0.006 (0.004)	0.004 (0.004)	-0.002 (0.003)	0.001 (0.001)	-0.000 (0.000)
number of children	0.013 (0.038)	0.018 (0.038)	0.013 (0.038)	-0.012 (0.040)	-0.006 (0.039)	0.001 (0.005)	0.002 (0.005)
extraversion	0.165*** (0.046)	0.164*** (0.046)	0.166*** (0.047)	0.133*** (0.045)	0.132*** (0.045)	0.019*** (0.007)	0.018*** (0.007)
agreeableness	0.385*** (0.055)	0.392*** (0.055)	0.385*** (0.055)	0.439*** (0.056)	0.445*** (0.056)	0.048*** (0.008)	0.049*** (0.008)
conscientiousness	0.037 (0.063)	0.036 (0.064)	0.038 (0.064)	-0.003 (0.067)	-0.003 (0.067)	-0.002 (0.009)	-0.003 (0.009)
neuroticism	0.027 (0.040)	0.028 (0.040)	0.022 (0.040)	0.051 (0.042)	0.053 (0.042)	0.003 (0.005)	0.004 (0.005)
openness	0.242*** (0.053)	0.241*** (0.053)	0.247*** (0.053)	0.217*** (0.052)	0.216*** (0.052)	0.027*** (0.007)	0.027*** (0.007)
risk-seeking	0.067*** (0.017)	0.066*** (0.017)	0.067*** (0.017)	0.048*** (0.017)	0.047*** (0.017)	0.009*** (0.003)	0.009*** (0.003)
education (ref.: apprenticeship)							

²⁶ This table is not part of the paper submitted to the *International Journal of Manpower*.

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	R1	R2	R3	R4	R5	R6	R7
	multilevel	multilevel	linear	heckman	heckman	log-lin	log-lin
training college	-0.006 (0.114)	-0.015 (0.114)	-0.013 (0.116)	-0.009 (0.121)	-0.018 (0.121)	0.004 (0.015)	0.002 (0.015)
technical college	-0.059 (0.074)	-0.081 (0.074)	-0.056 (0.075)	-0.251** (0.103)	-0.273*** (0.103)	-0.003 (0.011)	-0.007 (0.011)
university degree	-0.173** (0.071)	-0.180** (0.071)	-0.160** (0.071)	-0.386*** (0.105)	-0.392*** (0.105)	-0.012 (0.010)	-0.014 (0.010)
no/other education	-0.394 (0.336)	-0.397 (0.340)	-0.375 (0.338)	-0.352 (0.267)	-0.357 (0.267)	-0.062 (0.053)	-0.063 (0.054)
country of birth: Germany (ref.: all other countries)	-0.295** (0.120)	-0.314*** (0.120)	-0.288** (0.120)	-0.370*** (0.124)	-0.388*** (0.124)	-0.027 (0.018)	-0.030* (0.018)
permanent contract (ref.: fixed-term)	0.061 (0.153)	0.052 (0.153)	0.046 (0.154)	-0.024 (0.190)	-0.022 (0.190)	0.004 (0.019)	0.002 (0.019)
constant	4.006*** (0.468)	4.194*** (0.468)	4.039*** (0.469)	4.963*** (0.659)	5.133*** (0.657)	1.726*** (0.064)	1.758*** (0.066)
Heckman selection equation							
vigor				-0.017 (0.027)	-0.017 (0.027)		
dedication				0.172*** (0.028)	0.172*** (0.028)		
absorption				-0.016 (0.025)	-0.016 (0.025)		
commitment				0.025*** (0.003)	0.025*** (0.003)		
female (ref.: male)				-0.423*** (0.036)	-0.423*** (0.036)		
age ^a				0.003* (0.001)	0.003* (0.001)		

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	R1	R2	R3	R4	R5	R6	R7
	multilevel	multilevel	linear	heckman	heckman	log-lin	log-lin
number of children				0.058*** (0.018)	0.058*** (0.018)		
extraversion				0.073*** (0.020)	0.073*** (0.020)		
agreeableness				-0.157*** (0.025)	-0.157*** (0.025)		
conscientiousness				0.075** (0.031)	0.075** (0.031)		
neuroticism				-0.054*** (0.019)	-0.054*** (0.019)		
openness				0.005 (0.024)	0.005 (0.024)		
risk-seeking				0.037*** (0.008)	0.037*** (0.008)		
education (ref.: apprenticeship)							
training college				0.033 (0.053)	0.033 (0.053)		
technical college				0.487*** (0.036)	0.487*** (0.036)		
university degree				0.514*** (0.036)	0.514*** (0.036)		
no/other education				-0.104 (0.107)	-0.104 (0.107)		
country of birth: Germany (ref.: all other countries)				0.172*** 0.229***	0.172*** 0.229***		
permanent contract (ref.: fixed-term)				(0.083)	(0.083)		
constant				0.033 -1.845***	0.033 -1.845***		

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	R1	R2	R3	R4	R5	R6	R7
	multilevel	multilevel	linear	heckman	heckman	log-lin	log-lin
				(0.275)	(0.275)		
inverse mill's ratio λ_i				-0.551***	-0.548***		
				(0.192)	(0.192)		
number of observations/individuals	2,752	2,752	2,752	11,747	11,747	2,752	2,752
log-pseudo-Likelihood (R1, R2, R6, R7), adjusted R ² (R3), chi ² (R4, R5)	-4,903.928	-4,905.724	0.072	259.078	254.906	535.590	532.122

Notes: R1, R2: $N(\text{establishments}) = 904$; R4, R5: $N(\text{selected}) = 2,719$, $N(\text{non-selected}) = 9,028$; standard errors clustered at the establishment level in parentheses; ^a coefficient and standard error multiplied by 10; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own calculations based on data from the Linked Personnel Panel 2014-2021 and the IAB Establishment Panel 2014-2021

Table 35: Definitions and descriptions of all variables used in the analyses on supervisory responsibility and altruism²⁷

Variable name (label in Do-File)	Original variable	Dataset	Description
altruism (<i>altruism</i>)	maltruismus	lpp_employee	measure of the willingness to share with others without expecting anything in return on a scale from 0 to 10
duration of supervisory responsibility (<i>PV_years</i>)	mleitung, mleitung_seit	lpp_employee	the number of years an individual has been in a leadership position with supervisory responsibility (irrespective of employer changes)
scope of supervisory responsibility (<i>Menge_PV</i>)	mleitung, mleitung_anz	lpp_employee	the number of people an individual supervises
female (<i>female</i>)	msex	lpp_employee	<ul style="list-style-type: none"> • 1, if the employee is female • 0, otherwise
age (<i>Alter</i>)	mgebjahr	lpp_employee	the age of the individual (in years)
number of children (<i>Kinder</i>)	mkind_anz, mhhgroesse, mpartner_hh	lpp_employee	the number of children under 14 years that live within the household
extraversion (<i>Extraversion</i>)	mbig_komm, mbig_gesell, mbig_zur	lpp_employee	measure of the Big Five personality characteristic extraversion on a scale from 1 to 5

²⁷ This table is not part of the paper submitted to the *International Journal of Manpower*.

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Variable name (label in Do-File)	Original variable	Dataset	Description
agreeableness (<i>Verträglichkeit</i>)	mbig_grob, mbig_verzeih, mbig_freundl	lpp_employee	measure of the Big Five personality characteristic agreeableness on a scale from 1 to 5
conscientiousness (<i>Gewissenhaftigkeit</i>)	mbig_gruend, mbig_faul, mbig_effi	lpp_employee	measure of the Big Five personality characteristic conscientiousness on a scale from 1 to 5
neuroticism (<i>Neurotizismus</i>)	mbig_sorgen, mbig_nervoes, big_entsp	lpp_employee	measure of the Big Five personality characteristic neuroticism on a scale from 1 to 5
openness (<i>Offenheit</i>)	mbig_origi, mbig_kunst, mbig_phant, mbig_wissb	lpp_employee	measure of the Big Five personality characteristic openness on a scale from 1 to 5
risk-seeking (<i>risikofreudig</i>)	mrisiko	lpp_employee	measure of risk-taking on a scale from 0 to 10 (with 0 meaning “risk averse” and 10 meaning “fully prepared to take risks”)
educational level (<i>Ausbildung</i>)	mausb	lpp_employee	
apprenticeship (<i>Lehre</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is an apprenticeship • 0, otherwise
training college (<i>Beruflich_schulisch</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a training college • 0, otherwise
technical college (<i>Fachschule</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a technical college • 0, otherwise
university degree (<i>Fach_Hochschulabschluss</i>)			<ul style="list-style-type: none"> • 1, highest training qualification of the individual is a university degree • 0, otherwise
country of birth: Germany (<i>Deutschland</i>)	mgebdeutsch	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual is born in Germany • 0, otherwise
permanent contract (<i>unbefristet</i>)	mbef	lpp_employee	<ul style="list-style-type: none"> • 1, if an individual has a permanent contract • 0, otherwise
survey wave (<i>jahr</i>)	YEAR	IAB Establishment Panel	<ul style="list-style-type: none"> • 2014: wave 2 (2014/2015) • 2016: wave 3 (2016/2017) • 2018: wave 4 (2018/2019) • 2020: wave 5 (2020/2021)

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Variable name (label in Do-File)	Original variable	Dataset	Description
state (<i>Bundesland</i>)	bula2012, bula2014, bula2016, bula2018	IAB Establishment Panel	<ul style="list-style-type: none"> • 1, if state is Schleswig-Holstein • 2, if state is Hamburg • 3, if state is Lower Saxony • 4, if state is Bremen • 5, if state is North Rhine-Westphalia • 6, if state is Hesse • 7, if state is Rhineland-Palatinate • 8, if state is Baden-Württemberg • 9, if state is Bavaria • 10, if state is Saarland • 11, if state is Berlin • 12, if state is Brandenburg • 13, if state is Mecklenburg Western Pomerania • 14, if state is Saxony • 15, if state is Saxony-Anhalt • 16, if state is Thuringia
industry (<i>Branche15</i>)	t89b, v89b, x89b, z91b	IAB Establishment Panel	<ul style="list-style-type: none"> • 2, if industry is mining and quarrying • 3, if industry is electricity, gas and water supply, water and scrap, disposal, recycling • 4, if industry is manufacturing • 5, if industry is construction • 6, if industry is trade • 7, if industry is transport and storage • 8, if industry is information, communication • 9, if industry is accommodation and food services • 10, if industry is financial and insurance services • 11, if industry is business support, scientific and other professional services • 12, if industry is education • 13, if industry is human health and social work • 14, if industry is other services

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Variable name (label in Do-File)	Original variable	Dataset	Description
			<ul style="list-style-type: none"> 15, if industry is non-profit organizations, public administration
pers_id (<i>pers_id</i>)	persnr	lpp_employee	unique individual identification number
lpp_betnr (<i>lpp_betnr</i>)	betnr	lpp_employee, lpp_employer, IAB Establishment Panel	unique establishment identification number
Additional variables for the Heckman selection model			
commitment (<i>commitment</i>)	mcom_rest, mcom_bedeut, mcom_identif, mcom_zugehoer, mcom_emo, mcom_teil	lpp_employee	measure of commitment of an employee toward his organization on a scale from 0 to 30
vigor (<i>vigour</i>)	menga_energie, menga_fit, menga_freude	lpp_employee	measure of vigor as an aspect of work engagement on a scale from 1 to 5
dedication (<i>dedication</i>)	menga_begeist, menga_insp, menga_stolz	lpp_employee	measure of dedication as an aspect of work engagement on a scale from 1 to 5
absorption (<i>absorption</i>)	menga_glueck, menga_aufgeh, menga_mitreiss	lpp_employee	measure of absorption as an aspect of work engagement on a scale from 1 to 5

6 Conclusion

6.1 Summary

This dissertation aims to improve the understanding of leadership in corporations and gives empirical insights into the determinants and consequences of occupying leadership positions with supervisory responsibility. It becomes evident that leadership is not only important for corporations but also for individuals and society as a whole.

Within this dissertation, the first article sheds light on the concept of part-time leadership within corporations. The research findings infer that female individuals working part-time are less likely to attain leadership positions with supervisory responsibility compared to their full-time counterparts. The probability of obtaining such positions increases as the contractual working hours of part-timers increase and it varies depending on different corporate cultures. In firms that rely heavily on overtime and that restrict working from home, in other words, emphasize availability and visibility, there is a significant gap in occupying leadership positions between full-time and part-time employees. Conversely, this gap narrows in corporate cultures that do not prioritize physical presence in the workplace.

Starting from chapter 3, this dissertation shifts its focus from the factors determining the occupancy of leadership positions to their consequences. The second article of this dissertation highlights that occupying a leadership position with supervisory responsibility decreases individuals' intentions to leave their current employer in the short run. However, in the long run, supervisory responsibility leads to an increase in individuals' turnover intentions. The results suggest that HRM practices that enhance individuals' internal career development can counteract and mitigate this turnover-increasing effect of long-term supervisors. This offers valuable insights for employers seeking to retain their valuable leaders. The third article of this dissertation deals with leaders' labor-market related health behaviors. The findings of this article suggest that occupying a leadership position with supervisory responsibility reduces sickness absenteeism while at the same time increasing sickness presenteeism. Both effects are mediated by the demands of such positions, which require permanent availability and entail time pressure. The article in chapter 5 provides evidence for a negative correlation between supervisory responsibility and leader altruism. Over time, supervisory responsibility, as a form of structural power in the workplace, decreases the level of altruism among leaders. Additionally, altruism decreases as the number of subordinates under a leader's supervision increases.

6.2 Implications, limitations, and future research

The findings of this dissertation have several practical implications for individuals, employers, and politics. When examining the micro-level perspective, individuals aspiring to leadership positions with supervisory responsibility should be aware that their working hours can serve as a signal of their work engagement. In the case of part-time employment, adapting their contractual working hours might be a strategic step in achieving their career goal of reaching a leadership position. Furthermore, aligning themselves with corporate cultures or selecting employers based on their corporate culture can help mitigate obstacles on the path to part-time leadership. Also, employees in leadership positions should be mindful of the specific health concerns and demands associated with such positions in terms of sickness absenteeism and sickness presenteeism as well as the expected availability and time pressure causing these labor-market related health behaviors.

Expanding this to the organizational level, within the context of skills and managerial shortage, organizations may need to exploit all potentials within their workforce by emphasizing education, training, and creating a better work-life balance (Peichl et al., 2022). To achieve this, employers must shape their corporate cultures in ways that attract and self-select qualified part-time employees into their organizations. Additionally, organizations should adapt their governance mechanisms to improve leader recruitment and retention, even considering the incorporation of part-time employees into leadership positions and the implementation of certain career-related HRM practices. To prevail in long-term leadership effectiveness, organizations must monitor long-term supervisors regarding their behavior, as the findings suggest a tendency among leaders to become more self-centered or egoistic over time. Expanding the perspective even further, into the political sphere, policymakers should endeavor to establish more conducive conditions for part-time work. Politicians should strive to facilitate and promote part-time leadership as a means of addressing the shortage of skilled labor, recognizing that this issue extends beyond individual organizations and affects the broader economy.

Although this dissertation offers valuable contributions, it is not without limitations. One primary limitation of this study pertains to the potential issue of endogeneity in the empirical analyses. While simultaneous causality between working hours and supervisory responsibility raises concerns in article I, unobserved heterogeneity poses a challenge across all four articles because characteristics that are not directly observable, such as abilities, may introduce bias into the results. Additionally, the possibility of selection bias arises from certain employees self-selecting into leadership positions with supervisory responsibility, further reinforcing the

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issue of endogeneity in the empirical analyses. Due to data availability constraints, I had to rely on relatively short panel data for articles I, II, and III, and exclusively on cross-sectional data for article IV. To comprehensively address endogeneity concerns, I would need to draw upon long panel data. Despite implementing various robustness tests throughout the articles of this dissertation to mitigate endogeneity concerns (e.g., time lags, Heckmann selection model), it remains challenging to completely exclude the presence of endogeneity from the empirical analyses. As a result, the findings of this dissertation should be interpreted with caution in terms of making causal inferences. This limitation, however, offers avenues for future research to engage in leveraging longer panels to accurately identify causal effects.

Another potential shortcoming of this dissertation is that the data used is exclusively from German employers and their employees, which may raise concerns about the generalizability of the results to other countries. Replicating the studies with data from various countries would be instrumental in enhancing the broader applicability of the findings. This is particularly important when examining the concept of part-time leadership, as part-time work practices can significantly differ across countries. Furthermore, this research did not encompass employees' preferences in the empirical analyses which is imperative, especially in the context of the changing workforce dynamics. Incorporating the attitudes of the new generation entering the labor force is essential to understand what the future workforce desires in terms of their careers, work styles, and leadership expectations. It is also crucial to explore whether leadership will continue to be perceived as a desirable career step in the evolving landscape of the labor market. Addressing these limitations will contribute to a more comprehensive and relevant understanding of leadership in a rapidly changing world of work.

In conclusion, effective leadership serves as a cornerstone of organizational success because leadership is what matters and what makes the difference (Bass and Bass, 2008; Bennis, 2007). Emphasizing the timeless importance of leadership, the field of leadership research has experienced substantial growth in recent years, and this trend will continue. This ongoing advancement in leadership research will promote improved leadership, thereby fostering the enhancement of organizations, communities, and societies (Day et al., 2014).

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