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Sick of Leading? Supervisory Responsibility and its Consequences for Sickness Absence and Presenteeism

Funk Stephanie

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Stephanie Funk (stephanie.funk@wiwi.uni-augsburg.de)

University of Augsburg

Faculty of Business and Economics

D-86135 Augsburg, Germany

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Abstract

This research investigates how a leadership position with supervisory responsibility impacts two labor-market related health behaviors – sickness absence and presenteeism, i.e. working while being sick. Drawing on the job demands-resources (JD-R) model, this article argues that supervisory responsibility as both a job resource and a job demand increases an employee's work engagement. This, in turn, reduces sickness absence but increases presenteeism behavior. Thus, this study identifies two aspects of a leadership position with supervisory responsibility, i.e. permanent availability and time pressure, as two underlying mechanisms that account for the reduced sickness absence but increased presenteeism behavior. Using German linked employer-employee data, the empirical results show that while having supervisory responsibility reduces the number of sickness absence days, it increases the probability of engaging in presenteeism. Furthermore, the results show that both relationships are partially mediated by a leader being permanently available as well as by the time pressure experienced in a leadership position with supervisory responsibility. Finally, the results reveal that the reduced sickness absence among leaders is not attributable to the higher rates of presenteeism but to increased work engagement and better health. Briefly, this study enriches our understanding of job characteristics of leadership positions by showing that job demands can also result in desirable consequences.

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

Introduction

Nowadays, most young people do not strive to hold a leadership position in their job anymore (Business Insider, 2020). Because potential leaders are concerned by the demands of leadership positions which can have negative health consequences like for example severe stress and high burnout rates, it becomes increasingly hard for organizations to fill leadership positions. But is it really true: Does leading make you sick? And is this, in particular, caused by the need to be permanently available which is expected from leaders, and the time pressure that comes with this position? Seeing that a transition into a leadership position with supervisory responsibility can be rewarding and stressful, the relationship between leadership and health remains unclear (Fletcher and French, 2021). More research on leadership and health is needed to better understand the different aspects of leadership positions and their consequences for 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 absence and presenteeism. In general, reducing sickness absence and presenteeism is crucial for organizations because of the resulting economic costs like productivity losses (Grinza and Rycx, 2020; Keloharju et al., 2023; Yang et al., 2022) and increased sickness absence among other employees (Dietz et al., 2020). Additionally, sickness absence and presenteeism are proven to be good indicators of an individual's health (Gerich, 2015) which makes it highly relevant for employees and society as well. Consequently, it is indispensable to understand the underlying characteristics of a leadership position with supervisory responsibility that cause these labor-market related health behaviors to possibly decrease them. This may also help organizations support their leaders to cope with the demands of their position to retain these qualified employees. Therefore, the purpose of this study is to investigate how obtaining a leadership position with supervisory responsibility influences an

employee's sickness absence and presenteeism behavior. To fully understand these relationships, this study seeks to address whether the demands to be permanently available and the time pressure associated with a leadership position with supervisory responsibility cause these effects.

Based on the job demands-resources (JD-R) model by Demerouti et al. (2001) and the theoretical extension by Crawford et al. (2010), I propose that supervisory responsibility reduces sickness absence but increases presenteeism behavior. This paper asserts that supervisory responsibility can be seen as a job resource as well as a job demand. More precisely, this study follows the differentiation of job demands by Crawford et al. (2010) and classifies it as a challenge job demand due to the aspects of being permanently available and the time pressure experienced in a leadership position with supervisory responsibility, While supervisory responsibility being a job resource induces work engagement, it being a challenge demand promotes personal growth and also leads to increased motivation and consequently higher work engagement. Increased work engagement of employees ultimately reduces their sickness absence behavior but increases their probability of working while being sick. In this vein, I argue that the aspects of supervisory responsibility that identify it as a challenge job demand, i.e. being permanently available and experiencing time pressure, are the causal mechanisms explaining sickness absence respectively presenteeism.

For the empirical analyses, this study relies on German linked employer-employee data. The results of the empirical analyses confirm the predicted relations and show that albeit supervisory responsibility reduces sickness absence and increases presenteeism, the increased presenteeism behavior is not the reason for the lowered sickness absence of supervisors; but as I disclose, increased work engagement and better health is. As predicted, the results reveal that permanent availability and time pressure partially mediate the relationship between

supervisory responsibility and the two labor-market related health behaviors – sickness absence and presenteeism.

The present research adds to the literature in several aspects. Prior research suggests that effective leaders inculcate healthier followers (e.g., improve physical health, Franke et al., 2014; Zwingmann et al., 2014; increase psychological health, Walsh et al., 2014; reduce burnout, Schaufeli, 2015), but what about the leader's own health? While there is a large strand of literature on leadership behavior and its consequences for sickness absenteeism of subordinates (Bernstrøm and Kjekshus, 2012; Dietz et al., 2020; Nielsen and Daniels, 2016; Rugulies et al., 2021), research on this health behavior among leaders themselves is systematically missing. Even though there are studies that focus on leadership positions with supervisory responsibility and health-related outcomes, they either investigate well-being (Fletcher and French, 2021; Li et al., 2018), mental health (Boyce and Oswald, 2012), emotional exhaustion (Debus et al., 2019), or health in general (Schieman and Reid, 2009) and dedicate little attention to sickness absence. In addition to the missing evidence on supervisory responsibility and sickness absence, the results of the literature concerning related health consequences of leadership positions with supervisory responsibility are mixed. On the one hand, Debus et al. (2019) follow the conservation of resources theory and find supervisory responsibility to increase emotional exhaustion due to a loss of resources like time pressure. On the other hand, Schieman and Reid (2009) observe a null association between supervisory responsibility and health which they explain through the competing pattern of stress and resources of a higher status that balances out. Furthermore, Fletcher and French (2021) disclose that individuals experience a higher level of tension in the short run through transitioning into a new role with supervisory responsibility but they find that in the long run, a leader's emotional well-being is improved because they become socialized into their leadership role over time. Last, Courtright et al. (2014) establish that developmental

challenges of leaders increase their engagement but at the same time also induce emotional exhaustion.

Nevertheless, three studies analyze sickness absence behavior in particular but these articles do not explicitly investigate the phenomenon of supervisory responsibility: Kröger (2017) argues that individuals in higher job levels are less absent from work due to pressure to monitor themselves, a higher commitment, and a selection of employees into higher job levels that are more motivated and, therefore, less absent from work. Similarly, Nielsen et al. (2004) assert that decision authority decreases sickness absence because high levels of decision authority provide an individual with more room for coping with challenges at work. This, in turn, reduces the need for being absent as a coping strategy. Last, Keloharju et al. (2023) find that the appointment to a CEO position does not affect the health of the holder. They explain this finding with the imbalance between the demands and resources of a CEO position. After all, studies are missing that explicitly focus on the relationship between a leadership position with supervisory responsibility and sickness absence. Correspondingly, the first contribution of this article lies in quantifying the effect of a leadership position with supervisory responsibility on sickness absence.

Second, while there is evidence in the literature that supervisory responsibility induces presenteeism (Arnold, 2016; Hansen and Andersen, 2008; Miraglia and Johns, 2016), I extend existing research by distinguishing the effect of supervisory responsibility on presenteeism from the effect on sickness absence. Accordingly, I show that supervisors engaging in presenteeism is not the reason for supervisors being less absent from work but increased work engagement and better health is.

Third, this study answers the call of Bakker and Demerouti (2017) to investigate challenge job demands more explicitly and test their causality within the JD-R model. Correspondingly, this article extends the explanatory power of the JD-R model by showing that the two job

demands permanent availability and time pressure that can be classified as challenge job demands mediate the relationship between a leadership position with supervisory responsibility and sickness absence respectively presenteeism. To date, there is limited research that explores the association between job demands, job resources, and health consequences within the JD-R model. While Stiglbauer (2017) investigates the negative association between the job demand time pressure and well-being, Ragsdale and Hoover (2016) scrutinize work cell phone use as both, a job resource and a demand, and, therefore, find adverse effects on emotional exhaustion. On the contrary, Nyberg et al. (2022) find that high job demands do not mediate the relationship between employment in the Swedish Health Care industry and sickness absence. In this vein, this research contributes by empirically quantifying that the two challenge demands permanent availability and time pressure are partially the causal mechanisms explaining the relationship between a leadership position with supervisory responsibility and sickness absence respectively presenteeism. This study is, to the best of my knowledge, the first to theoretically and empirically take into account the mediating effect of the two challenge job demands permanent availability and time pressure of a leadership position with supervisory responsibility.

The remainder of the paper proceeds as follows. First, I develop the theoretical argument based on the JD-R model and derive the hypotheses of this article. Second, I give details on the dataset, the variables, and the econometric framework used for the empirical analyses, followed by descriptive statistics. Next, I present the results and provide additional analyses. Finally, the article concludes with a discussion of the results and the limitations and implications of this study.

Theoretical Background and Hypotheses Development

To develop the theoretical argument, I draw upon the JD-R model (Demerouti et al., 2001). According to a recent meta-analytic review by Lesener et al. (2019), this model is one of the

most popular frameworks in occupational health psychology to study job characteristics and health consequences. While it was originally formulated to identify the antecedents of engagement and burnout, it has also been widely used to explain other health-related outcomes (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 absence and presenteeism.

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: 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: 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) refine the JD-R model. In their extension of the JD-R model, they claim that albeit 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 differentiate between challenge and hindrance job demands. Concerning hindrance demands, Crawford et al. (2010) argue 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; Li et al., 2018), it also entails regular participation in decision-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) since 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 since 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. Employees who are more engaged in their work show higher levels of motivation and do not need to use absenteeism as a mechanism to cope with stress. Further, engaged employees also do not need to withdraw from work to escape their job like less engaged employees do (Schaufeli et al., 2009). Consequently, engaged employees are less likely to report themselves as ill which results in fewer sickness absence days. Based on these arguments and in line with the JD-R model, I put forward the following hypothesis:

Hypothesis 1 (H1): Individuals in a leadership position with supervisory responsibility have fewer sickness absence days than individuals in a position without supervisory responsibility.

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

Hypothesis 2 (H2): For individuals in a leadership position with supervisory responsibility, the probability of engaging in presenteeism is higher than for individuals in a position without supervisory responsibility.

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 absence and respectively 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 are also confronted with an increased number of tasks and responsibilities where, 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). 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 absence days of an employee respective increases the probability of an employee working while being sick 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 absence.

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

Figure 1 visualizes the conceptual framework of this study.

[Insert Figure 1 about here]

Data and Methodology

Sample

For the empirical analyses, this article uses data from the Linked Personnel Panel (LPP) (Ruf et al., 2020b), a unique employer-employee panel data set provided by the German Institute of Employment Research (IAB) which is representative of German private-sector establishments with at least 50 employees liable to social security (Mackeben et al., 2021). Additionally, I link the LPP data to the administrative individual-level data from the Integrated Employment Biographies provided by the Federal Employment Agency (LPP-ADIAB). Furthermore, I match 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 et al., 2020a). This allows simultaneous consideration of the employee and employer perspectives. Additionally, it entails copious details on job demands relevant to examine the mediating effects. While 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 use the first four waves for the empirical analyses.

For the analyses, I restrict the sample to employees aged 67 or younger following the statutory retirement age in Germany. Consequently, the final sample considering *sickness absence* as the dependent variable comprises 12,629 observations from 9,152 employees, working in 1,216 firms (sample I). Since information on the main variable *presenteeism* is only observed from wave 3 onwards, I only use waves 3 and 4 for the analyses considering

presenteeism as the dependent variable (sample II). Thus, the final sample of Sample II consists of 5,593 observations from 4,751 individuals working for 790 employers.

Measures

Main variables. In the analyses, the two dependent variables are *sickness absence* and *presenteeism*. I measure the dependent variable *sickness absence* by the self-reported number of days an individual was unable to work in the last year due to illness. This explicitly includes the total number of days and not only the number of days with an official doctor's note. Since research shows that self-reported days of sickness absence are strongly associated with recorded sickness absence days from employers' registers (Ferrie et al., 2005), they are a reliable predictor for sickness absence. In addition, the effect of whether an employee works while being sick is captured by the binary variable *presenteeism* which relies on employee self-reported information. This variable takes the value 1 if an individual went to work at least one day in the last year although they should have stayed at home due to their state of health and 0 otherwise.

The central independent variable is *supervisory responsibility*. It is a binary variable that takes the value 1 if the individual is supervising other employees and 0 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 measure *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 quantify 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 absence days as well as the probability of working while being sick. I, consequently, follow the literature on absenteeism and presenteeism (Brborović et al., 2017; Gosselin et al., 2013) and control for three groups of explanatory factors: individual characteristics, job characteristics, and establishment characteristics. Factors on the individual level comprise whether an employee is *female* (Bekker et al., 2005; Lidwall and Marklund, 2006), their *age* (Gosselin et al., 2013) as well as the *square of age*, a subjective ranking of an individual's current *health status* measured on a five-point Likert scale (Gosselin et al., 2013), and the *Big Five personality characteristics* in line with the literature that emphasizes an individual's personality in determining 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 absenteeism and presenteeism (Bratberg et al., 2002; Kristensen et al., 2010; Marmot, 1994; Vahtera et al., 1996), I include 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*, 5 dummy variables indicating an individual's *education level* as well as an individual's net *income*.

Within the group of job characteristics, I control for an individual's *tenure* with the current employer (Tomba 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 examines the influence of job resources and job demands on sickness absence and presenteeism (Frick et al., 2018; Jacobsen and Fjeldbraaten, 2018; Johns, 2010; Leineweber et al., 2011; Pousette and Hanse, 2002; Rugulies et al., 2007; Schaufeli et al., 2009; Vahtera et al., 2000), I further include an individual's *job satisfaction*, its *pay satisfaction*, its *fairness of pay*, its *fair treatment by the supervisor*, its *perceived job security*, its level of *autonomy*, 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 assesses influencing factors on the establishment level and encompasses the *establishment size* as well as 15 *industry* dummy variables. Finally, I add a dummy variable for each survey wave to correct for time effects.

Descriptive statistics. Table 1 reports summary statistics for all the variables used in the analyses. As Column 1 (Sample I) depicts, the average yearly number of sickness absence days in the sample is 12.06 which only slightly exceeds the average number of registered sickness absence days in Germany with 10.9 reported by the German Federal Statistical Office (2022) in 2019. Also, around 30% of the sample is in a leadership position with supervisory responsibility and 27% percent are female. While most individuals do not feel the need of being permanently available (2.02), they do experience high time pressure at work (3.57). Table 2 provides initial insights into the proposed relationships: as expected, the average number of sickness absence days differs significantly if comparing supervisors to non-supervisors. Additionally, permanent availability and time pressure are both more common for supervisors than for non-supervisors.

Estimation Strategy

To test the predicted relationships of Hypotheses 1 and 2, I estimate two different model specifications. First, I run a random-effects negative binomial regression to examine the relation between supervisory responsibility and sickness absence. Given that the dependent variable *sickness absence* 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, which means that the (conditional) variance equals the (conditional) mean.

Table 1: Descriptive Statistics

	Mean	SD	Min	Max
main variables				
sickness absence	12.060	24.230	0	230
presenteeism	0.699	–	0	1
supervisory responsibility	0.295	–	0	1
permanent availability	2.021	1.112	1	5
time pressure	3.569	1.195	1	5
individual characteristics				
female	0.267	–	0	1
age	47.260	10.180	18	67
age ²	2,337.000	902.400	324	4,489
health status	3.660	0.931	1	5
extraversion	3.643	0.741	1	5
agreeableness	3.636	0.633	1	5
conscientiousness	4.047	0.570	1.667	5
neuroticism	2.692	0.766	1	5
openness	4.349	0.482	1.333	5
partner in the same household	0.790	–	0	1
number of children	0.385	0.751	0	7
size of household	2.777	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
net income	2,494.100	2,289.800	1	170,000
job characteristics				
tenure	14.750	10.560	0	44
part-time	0.126	–	0	1
overtime hours	3.787	4.533	0	60.200
job satisfaction	7.507	1.714	0	10
pay satisfaction	6.993	1.998	0	10
fairness of pay	3.598	1.119	1	5
fair treatment by the supervisor	3.942	0.933	1	5
perceived job security	0.658	–	0	1
autonomy	3.968	0.986	1	5
number of subordinates	7.136	137.400	0	15,000
work from home	0.220	–	0	1
physical exertion	2.261	1.411	1	5
bad working environment	2.744	1.523	1	5
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 12,629 individual level observations from 9,152 employees, descriptive statistics of establishment characteristics are based on 1,216 establishments (Sample I); descriptive statistics of the variable presenteeism is based on Sample II (5,593 observations from 4,751 individuals)

Source: Own calculations based on the LPP-ADIAB (2020) and the IAB Establishment Panel

Table 2: Descriptive Statistics of the Main Variables by Leadership Position

	non-supervisors	supervisors	difference
sickness absence	13.086	9.612	3.474***
presenteeism	0.695	0.709	-0.014
permanent availability	1.790	2.575	0.785***
time pressure	3.418	3.930	-0.512***

*Notes: Descriptive statistics of the variables sickness absence, permanent availability and time pressure are based on Sample I; descriptive statistics of the variable 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

However, a formal test of overdispersion reveals that the present data are significantly overdispersed¹. 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: 243). Since there is significant evidence of overdispersion in the present data, I follow the suggestions of Long and Freese (2014) and previous research on sickness absenteeism (Johns, 2011; Platts et al., 2020) and prefer a negative binomial model over a Poisson model. Second, due to the binary scaling of the second dependent variable *presenteeism*, I estimate the probability of working while being sick (H2) using a random-effects probit model. Since 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 absence and presenteeism, I employ multiple mediation analyses. More precisely, I run two separate models for each dependent variable to test Hypotheses 3 (a/b) and 4 (a/b) as depicted in Figure 1. For the calculation of the causal mediation effects, I follow the approach of Hicks and Tingley (2011). They base their approach on the key underlying assumption of sequential

¹ The test rejects the null hypothesis of equidispersion with $p < 0.001$ ($t = 15.85$). This means that the (conditional) variance of the data exceeds the (conditional) mean (Cameron and Trivedi (2009: 561).

ignorability², which I assume to be fulfilled in the present case but also propose sensitivity analyses relating to this matter later. While the results of their approach are identical to the traditional approach by Baron and Kenny (1986) for a continuous mediator and a continuous outcome variable, the employed approach is advantageous because it accommodates other data types including binary outcomes (Imai et al., 2010). After all, this is essential to correctly estimate the mediation effects on the binary outcome variable *presenteeism*. Since the approach by Hicks and Tingley (2011) only allows the computation of OLS, probit, and logit models and no panel estimators, I estimate a pooled linear model for *sickness absence* and a pooled probit model for *presenteeism*.

Results

Baseline Results

To test Hypothesis 1, I examine the results of the negative binomial regression which are displayed in Table 3 (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 reports on average around 1.5 fewer sickness absence days ($p < 0.01$) respectively misses 11.8 percent less ($IRR = 0.882$; $p < 0.01$) due to sickness compared to an individual without supervisory responsibility (Column 2). This not only confirms the postulated Hypothesis (H1) but, also, stresses the economic relevance of this result.

² 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, Keele, and Tingley 2010: 310).

Next, to quantify the relationship between supervisory responsibility and presenteeism (H2), I examine the results of the random-effects probit regression which are displayed in Table 3 (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 the probability of presenteeism, finds support. As the average marginal effects show, the probability for an individual in a leadership position with supervisory responsibility to work while being sick is 4.9 percentage points higher ($p < 0.01$) than for an individual in a position without supervisory responsibility.

Table 3: Estimation of Sickness Absence and Presenteeism

	sickness absence (m1)		presenteeism (m2)	
	coefficients	average marginal effects [irr]	coefficients	average marginal effects
supervisory responsibility	-0.126*** (0.030)	-1.491*** (0.355) [0.882***]	0.184*** (0.067)	0.049*** (0.018)
individual characteristics				
female	0.129*** (0.033)	1.521*** (0.398) [1.137***]	0.317*** (0.080)	0.084*** (0.021)
age	-0.056*** (0.009)	-0.659*** (0.109) [0.946***]	-0.031 (0.024)	-0.008 (0.006)
age ²	0.001*** (0.000)	0.007*** (0.001) [1.001***]	0.000 (0.000)	0.000 (0.000)
health status	-0.375*** (0.015)	-4.441*** (0.197) [0.687***]	-0.378*** (0.043)	-0.100*** (0.010)
extraversion	0.097*** (0.018)	1.145*** (0.218) [1.102***]	0.035 (0.039)	0.009 (0.010)
agreeableness	0.055** (0.023)	0.655** (0.276) [1.027**]	-0.037 (0.052)	-0.010 (0.014)
conscientiousness	-0.098*** (0.027)	-1.155*** (0.319) [0.907***]	0.022 (0.063)	0.006 (0.017)
neuroticism	0.043** (0.017)	0.504** (0.201) [1.043***]	0.233*** (0.039)	0.062*** (0.010)
openness	0.072***	0.847***	0.061	0.016

	(0.021)	(0.249)	(0.050)	(0.013)
		[1.074***]		
partner in the same household	0.140***	1.655***	0.200***	0.053***
	(0.032)	(0.378)	(0.074)	(0.019)
		[1.150***]		
number of children	0.095***	1.129***	0.156***	0.041***
	(0.020)	(0.239)	(0.053)	(0.014)
		[1.100***]		
size of household	-0.032**	-0.383**	-0.038	-0.010
	(0.014)	(0.160)	(0.031)	(0.008)
		[0.968**]		
education (reference: apprenticeship)				
training college	0.015	0.175	0.058	0.015
	(0.043)	(0.503)	(0.117)	(0.031)
		[1.015]		
technical college	-0.034	-0.404	0.074	0.020
	(0.032)	(0.382)	(0.069)	(0.018)
		[0.966]		
university degree	-0.079**	-0.934**	-0.079	-0.021
	(0.031)	(0.367)	(0.077)	(0.020)
		[0.924**]		
no/other education	-0.015	-0.176	-0.111	-0.029
	(0.098)	(1.165)	(0.187)	(0.050)
		[0.985]		
net income [†]	-0.004	-0.042	-0.393***	-0.104***
	(0.081)	(0.960)	(0.115)	(0.030)
		[1.000]		
job characteristics				
tenure	-0.001	-0.007	0.005*	0.001*
	(0.001)	(0.016)	(0.003)	(0.001)
		[1.000]		
part-time	-0.145***	-1.713***	-0.207**	-0.055**
	(0.044)	(0.520)	(0.098)	(0.026)
		[0.865***]		
overtime hours	-0.014***	-0.161***	0.015*	0.004*
	(0.003)	(0.034)	(0.008)	(0.002)
		[0.986***]		
job satisfaction	-0.023***	-0.271***	-0.034*	-0.009*
	(0.007)	(0.080)	(0.019)	(0.005)
		[0.977**]		
pay satisfaction	0.009	0.103	-0.009	-0.002
	(0.008)	(0.095)	(0.020)	(0.005)
		[1.009]		
fairness of pay	-0.038***	-0.455***	-0.075	-0.020
	(0.013)	(0.153)	(0.046)	(0.012)
		[0.962**]		
fair treatment by the supervisor	-0.013	-0.156	-0.117***	-0.031***
	(0.014)	(0.164)	(0.035)	(0.009)
		[0.987]		
perceived job security	0.020	0.240	-0.194***	-0.051***
	(0.024)	(0.289)	(0.064)	(0.017)
		[1.021]		

autonomy	-0.016 (0.013)	-0.191 (0.155) [0.984]	0.033 (0.032)	0.009 (0.009)
number of subordinates	-0.001 (0.001)	-0.012 (0.010) [0.999]	-0.000 (0.000)	-0.000 (0.000)
work from home	-0.081*** (0.031)	-0.963*** (0.367) [0.922**]	-0.034 (0.070)	-0.009 (0.019)
physical exertion	0.023** (0.011)	0.275** (0.135) [1.024**]	0.016 (0.027)	0.004 (0.007)
bad working environment	0.055*** (0.009)	0.646*** (0.108) [1.056***]	0.039* (0.022)	0.010* (0.006)
establishment characteristics				
establishment size (reference: small enterprises (10-49))				
micro enterprises (less than 10)	-0.393 (6.449)	-4.027 (53.938) [0.675]	—	—
medium-sized enterprises (50-249)	-0.067 (0.161)	-0.809 (1.996) [0.935]	0.335 (0.371)	0.099 (0.117)
large enterprises (250 and more)	-0.037 (0.162)	-0.446 (2.008) [0.964]	0.428 (0.373)	0.124 (0.118)
constant	1.725*** (0.303)		2.935*** (0.806)	
number of observations	12,629	12,629	5,593	5,593
number of individuals	9,152	9,152	4,751	4,751
number of establishments	1,216	1,216	790	790
log (pseudo-)likelihood	-4,0359.538		-3,117.965	

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; [†]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

To provide supplementary support for the theoretical predictions, I present two additional analyses regarding the causal mechanism between supervisory responsibility and sickness absence. First, I want to disclose that the effect of supervisory responsibility in reducing sickness absence is not due to supervisors engaging in 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 absence. For brevity, Table 4 only presents the results of the average direct, the average indirect mediation effects as well as the total effects.³ Concerning the mediation analysis, I analyze 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 4, 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, is statistically significant and negative (ACME= -0.262, $p < 0.1$). Additionally, the average direct effect (ADE) of the treatment, i.e. all other causal mechanisms linking supervisory responsibility to sickness absence, is statistically significant and negative as well (ADE=-1.800, $p < 0.01$). The results of the negative mediation effect of an individual's *health status* indicate that supervisory responsibility, indeed, reduces the number of sickness absence days partially through improving an employee's health.

Also, I estimate another mediation model with presenteeism as the mediator of the relationship between supervisory responsibility and sickness absence (Table 4). However, the corresponding results show that the average causal mediation effect of presenteeism is not statistically significant. This implies that presenteeism is not the causal mechanism for fewer sickness absence days of supervisors. In sum, these results provide additional evidence for the predicted theoretical mechanism of supervisory responsibility reducing sickness absence. In the next step, I examine the results of the mediating effects of permanent availability and time pressure which are displayed in Table 5.⁴

³ 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.

⁴ For brevity, Table 5 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.

Table 4: Additional Analyses regarding the Causal Mechanism between Supervisory Responsibility and Sickness Absence

	average direct effect (ADE)	average indirect effect (ACME)	total effect (TE)	% of TE mediated
supervisory responsibility → health status → sickness absence	-1.800*** (0.488)	-0.262* (0.137)	-2.063*** (0.502)	12.752%
supervisory responsibility → presenteeism → sickness absence	-2.242*** (0.648)	-0.024 (0.037)	-2.267*** (0.643)	0.011%

*Notes: Control variables as in Models M1 and M2 (Table 3); 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 absence that is caused by the mediator permanent availability (H3a), the average causal mediation effect is statistically significant and negative (ACME=-0.338, $p < 0.01$). Furthermore, the average direct effect of the treatment is statistically significant and negative as well (ADE=-1.489, $p < 0.01$). In this case, the mediation, i.e. being permanently available, accounts for around 18.4 percent of the total effect of supervisory responsibility reducing sickness absence (TE=-1.827, $p < 0.01$). Thus, in the light of Hypothesis 3a, permanent availability partially mediates the effect of supervisory responsibility on sickness absence. Put differently, being permanently available partially causes the reduction of sickness absence. Concerning time pressure, I also identify a partial mediation with a statistically significant negative average causal treatment effect (ACME = -0.127, $p < 0.1$). In detail, approximately 6.9 percent of the total effect of supervisory responsibility on sickness absence runs through an employee experiencing time pressure.

Further, I examine the results concerning presenteeism. While the average direct effect of supervisory responsibility on presenteeism is statistically significant and positive when considering permanent availability as a mediator (ADE=0.027, $p < 0.1$), the average causal

mediation effect is also statistically significant and positive (ACME=0.016, $p < 0.01$). This indicates that there is empirical support for hypothesis H4a, i.e. that permanent availability transmits the effect of supervisory responsibility on presenteeism, at least partially. In line with the theoretical expectations of Hypothesis 4b, the results also reveal that time pressure, correspondingly, acts as a partial mediator of the effect of supervisory responsibility on presenteeism (ACME=0.011, $p < 0.01$).

Table 5: Mediating Effects of Permanent Availability and Time Pressure

	average direct effect (ADE)	average indirect effect (ACME)	Total effect (TE)	% of TE mediated
H3a: supervisory responsibility → permanent availability → sickness absence	-1.489*** (0.469)	-0.338*** (0.101)	-1.827*** (0.451)	18.439%
H3b: supervisory responsibility → time pressure → sickness absence	-1.700*** (0.433)	-0.127* (0.069)	-1.827*** (0.440)	6.918%
H4a: supervisory responsibility → permanent availability → presenteeism	0.027* (0.014)	0.016*** (0.003)	0.043*** (0.014)	36.749%
H4b: supervisory responsibility → time pressure → presenteeism	0.030** (0.014)	0.011*** (0.002)	0.043*** (0.014)	27.438%

*Notes: Control variables as in Models M1 and M2 (Table 3); 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

To sum up, I provide first evidence 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 absence days respectively engage in presenteeism with a higher probability than individuals without supervisory responsibility.

Robustness Checks

To lend further support to the empirical results, I conduct several robustness tests. These address alternative model specifications as well as the hierarchical structure of the data. For brevity, Table 6 only presents the results relating to the main variables. The results concerning the control variables accord with those from the main model and can be obtained from the author on request. First, previous research applies (various) different empirical methods when estimating the number of sickness absence days. Therefore, I show 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 6). Second, even though I showed that overdispersion is a problem in the present data, I nevertheless follow Leineweber et al. (2017), Nielsen et al. (2004), and Rugulies et al. (2007) and re-estimate the results of Model M1 from the main analyses using a Poisson model (Table 6, Model R2). All the above alternative model specifications do not change the results qualitatively.

Table 6: Robustness Checks

	R1	R2	R3	R4
	Linear	Poisson	Multilevel	Multilevel
dependent variable	sickness absence	sickness absence	sickness absence	presenteeism
supervisory responsibility	-1.793*** (0.459)	-0.089*** (0.020)	-0.155*** (0.038)	0.176** (0.069)
individual characteristics	yes	yes	yes	yes
job characteristics	yes	yes	yes	yes
establishment characteristics	yes	yes	yes	yes
number of observations	12,629	12,629	12,629	5,593
number of individuals	9,152	9,152	9,152	4,751
number of establishments	1,216	1,216	1,216	790
R ² (linear model)/ log (pseudo)-likelihood	0.126	-56,046.512	-40,359.927	-3,117.667

Notes: Control variables as in Models M1 and M2 (Table 3); standard errors in parentheses (R1: standard errors clustered at the establishment level, R3: bootstrapped standard errors with 200 resamples, R5, R6: robust standard errors); * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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

Second, the multisource data set used in this study implies that employees are nested within establishments. To acknowledge the hierarchical structure of the data, I follow Steenbergen and Jones (2002) and conduct a multilevel model which calculates inferences more precisely by explicitly acknowledging that observations are more similar within establishments than between them (Table 6, Model R3 and R4). The findings reveal robust results.

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. 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 mediation⁵. 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. Figure 2 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 H4b are the least sensitive to a potential violation of the underlying sequential ignorability assumption.

[Insert Figure 2 about here]

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

⁵ I use ordinary least squares regressions to test the hypothesized relationships for both the continuous and binary dependent variable due to computational restrictions.

literature on health-related outcomes of supervisory responsibility, the present results are informative for several reasons.

First, the results of this study are the first to confirm the theoretical prediction that a leadership position with supervisory responsibility reduces sickness absence. 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; Li et al., 2018; Schieman and Reid, 2009). This article further contributes to research on sickness absence of supervisors by showing that engaging in presenteeism is not the underlying mechanism why employees in a leadership position with supervisory responsibility report fewer sickness absence days, but increased engagement and improved health is.

Second, this research contributes to the application of the JD-R model (Demerouti et al., 2001) by revealing that supervisory responsibility, being a job demand and a job resource, reduces sickness absence but increases 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: 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 absence respectively presenteeism. These results 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 absence. This finding reinforces the importance to differentiate job demands into challenge and hindrance demands. Briefly, the empirical findings confirm 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 reveal, job demands can also induce positive consequences.

The results of this research also have several practical implications. Since the costs of absenteeism and 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 shows that being in a leadership position does not make employees sick. This is not just pertinent for leaders themselves but also for organizations since having unhealthy leaders can negatively affect an organization's performance (Keloharju et al., 2023; Sirén et al., 2018). Employers could, additionally, counteract the negative consequences of presenteeism by reducing the need for permanent availability and the time pressure of supervisors. This may seem ambiguous since these aspects that lead to presenteeism would, on the contrary, reduce sickness absence. However, this challenges employers to avoid presenteeism among supervisors by not just reducing all job demands of a position but to encourage their supervisors to be aware of the negative consequences of presenteeism without lowering job demands. Another organization-driven JD-R intervention which 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: 185). Finally, for employees, the results show that obtaining a leadership position with supervisory responsibility can reduce sickness absence 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 absence 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 amount 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 while specifically differentiating between challenge and hindrance demands. Additionally, while this article only focuses on job demands of leadership positions, I encourage future research to also identify the effects of job resources that transmit the effect of supervisory responsibility on sickness absence and 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.

Conclusion

This article provides evidence that holding a leadership position with supervisory responsibility affects sickness absence and presenteeism through the partial mediation of permanent availability and time pressure. While a leadership position with supervisory responsibility reduces the number of sickness absence days, it increases the probability of employees engaging in presenteeism. 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.

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Figures

Figure 1: Conceptual Framework of the Relation between Supervisory Responsibility, Permanent Availability, Time Pressure, and Sickness Absence respectively Presenteeism

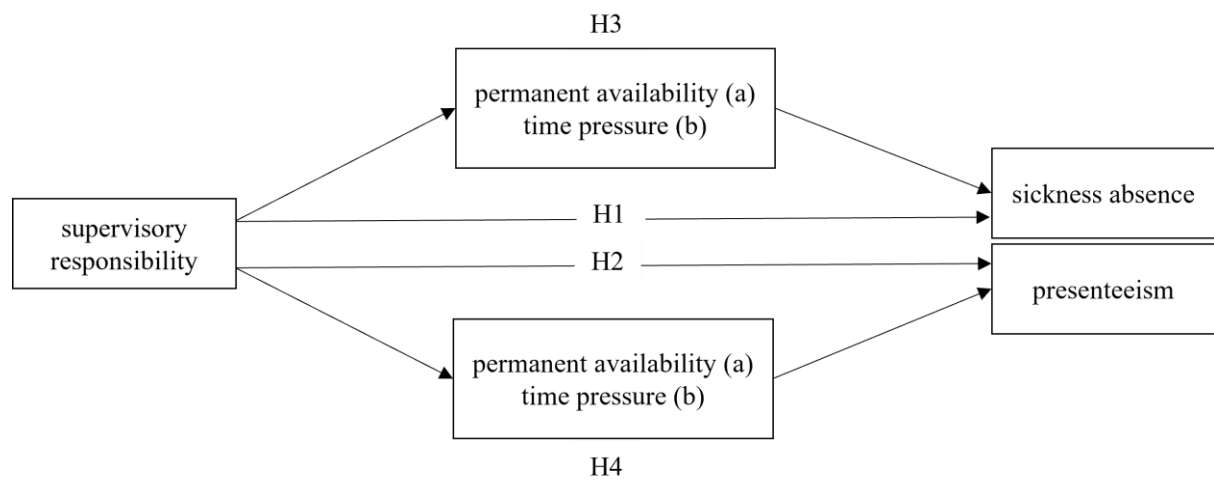
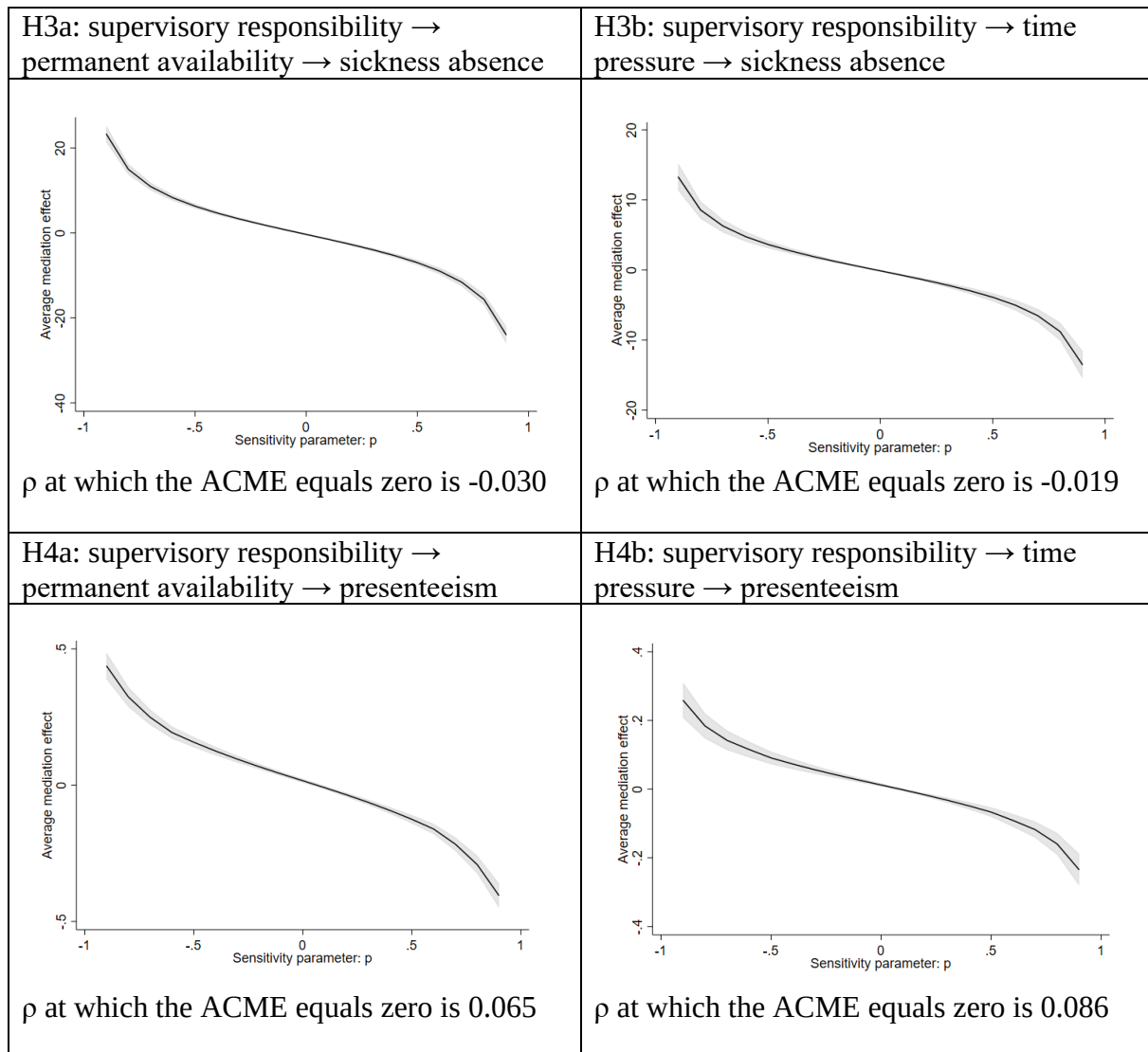


Figure 2: Sensitivity Analyses – Average Causal Mediation Effects at Different Values of ρ



Notes: The gray areas represent the 95% confidence interval for the mediation effects at each value of ρ ;
Source: Own calculations based on data from the LPP-ADIAB 2012–2019 and the IAB Establishment Panel 2012–2019