Master Thesis

Research on the influence of telecommuting on psychological well-being, the indirect effects of autonomy, relatedness and competence (SDT) and the interaction of empowering leadership

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Abstract

The psychological well-being of employees is valuable to organizations to be successful and competitive. The shift from working at the office to working from home has its positive as well as negative effects on employees' well-being. To prevent employees' well-being from being endangered by telecommuting more research is needed on this topic. Therefore this research examined if there is a relation between telecommuting and psychological well-being. Next to that, to have a better understanding of this relation, the psychological needs autonomy, relatedness and competence (SDT), were elaborated as a mediator. All three needs were found to have a positive indirect effect. Rather surprising was that telecommuting positively related with the need for relatedness, unlike the expected negative relation due to a decrease in social contact. Furthermore, since leadership plays an important role in safeguarding employees' psychological well-being, it was chosen to analyze the influence of empowering leadership in the context of telecommuting. The results have shown that empowering leadership positively relates with psychological well-being. Subsequently, it was expected that the degree of experienced empowering leadership would moderate the relation between telecommuting and psychological well-being but this could not be confirmed. At last, additional analysis has shown that the relationship between empowering leadership and psychological well-being is mediated by the psychological needs for autonomy, relatedness and competence. To test the hypothesis, data was collected using questionnaires resulting in a sample of 131 respondents with an average age of 29. The sample population approximately telecommuted for 45% at the moment of participating.

Key words: *telecommuting, psychological well-being, self-determination theory, empowering leadership*

Preface

In front of you lies the thesis ´Research on the influence of telecommuting on psychological well-being, the indirect effects of autonomy, relatedness and competence (SDT) and the interaction of empowered leadership'. This study was conducted as part of the Master Business Administration, with a specialization in Strategic Human Resources Leadership at the Radboud University in Nijmegen.

The topic I chose to research was about COVID-19 and major life events. My interest in studying this originated from experiences in my own private life. Two years ago, at the start of 2020, I was working full-time at a recruitment organization in Nijmegen with a team of around 12 members. When the COVID-19 outbreak forced us to work from home I experienced many things, like motivational issues and a decrease in social contact with my co-workers. As COVID-19 didn't seem to go away soon I decided something had to change for me. Although COVID-19 can be considered a major life event, for me going back to university after two years of fulltime work was a major life event as well. That's why the major life events theme was appealing to me. Looking back at this decision I am more than happy that I took the chance to learn more about what employees drive and about strategic human resources in general. Writing my master thesis about telecommuting, psychological well-being and empowering leadership gave me a better understanding of my own situation back then, as well as the situation of other individuals who telecommute. Now it is time to spread all the knowledge that I have acquainted at the Radboud University and help HR departments to take care and support their employees.

I would like to thank several people who helped me very well during the writing of my thesis. To start with I would like to thank my supervisor Marloes van Engen for her support and constructive feedback throughout the writing of my thesis. Next to that I would like to thank Rawan Ghazzawi, my second assessor, for her valuable feedback. I would like to thank my thesis circle for the support throughout the process. Kathy Tavares thank you for gathering our data together, thanks to you my research got respondents from India, South-Korea and the UAE. At last, Jasper Jansen and Linde Kaspersma thank you for working together this master on many projects including the thesis. Our collaboration the past year made studying easier, and our coffee breaks made studying more much more enjoyable.

Enjoy reading my thesis.

Bart Heersink,
Nijmegen, June 2022

Introduction

The shift to remote working brought on by COVID-19 has been astonishing (Hirsch, 2021). In March 2020, the World Health Organization officially announced that the COVID-19 outbreak had grown to a 'pandemic'(World Health Organization, 2020). This pandemic forced organizations to adapt and change rapidly. Telework arrangements – also referred to as telecommuting or working from home - were adopted, used and managed without a proper understanding of its effects (Darouei & Pluut, 2021). In the context of working from home due to COVID-19, well-being was endangered for many employees (Kniffin et al., 2020). While some employees were privileged to have a separate office space in their home, most employees had to work from their temporary desk in their kitchen, living room or bedroom. Some of them being disturbed by partners, roommates or children, others alone in their houses, isolated from people (Kniffin et al, 2020). Many employees that work from home face difficulties with interacting effectively with co-workers and managers which increase job strain (Bailey & Kurland, 2002). Whereas before the pandemic organizations were holding back on work from home arrangements, it is now assumed that working from home is likely to remain important after the pandemic (Bauwens et al., 2021). Arguments for this are the increased employee productivity (Algrari, 2017) and the implication that only 10% of employees want to go back to working in the office full-time (Keegan, 2021). Therefore, to prevent the ongoing endangerment of employee well-being while working from home, it is useful to have a better understanding of the relation between these two concepts. Furthermore, while employees are troubled by well-being issues, organizations on the other hand encountered changes in the need for leadership (Kniffin et al., 2020). Leadership plays a major role in the success of telework (Bell & Kozlowski, 2002) as well as in regulating employee well-being (Zhang et al., 2014). One leadership style in particular, called empowering leadership, was perceived well with the absence of face-to-face contact in telework (Bauwens et al., 2021; Stoker et al., 2021; Coun et al., 2021). As a result, the current research questions what the relation is between telecommuting and well-being, and what influence empowering leadership has on that relation.

Telecommuting is described as working from home or working remotely while staying connected to the organization via communication technologies (Allen et al., 2015). Hager (2018) argues that telecommuting changes three aspects of work: the work situation, the quality of communication and the perceived social support. Telecommuting has both positive and negative outcomes. The best known positive outcomes of telecommuting are flexibility and increase of job autonomy (Kniffin et al., 2020). On the other hand, according to Dulebohn and Hoch (2017) telecommuting is challenged by lower team-engagement, less trust among team members and social isolation. Especially the last issue and its implications for mental health deserve further attention in the context of telework. The quality of communication and the perceived social support from co-workers are essential for employees' mental health and motivation (Hager, 2018). According to Ryff (1995), health and motivation are associated with psychological well-being. Subsequently, employees' psychological well-being determines the performance and competitiveness of an organization (Taris &

Schreurs, 2009; Rynes et al., 2002). Therefore, psychological well-being should be considered increasingly relevant in the context of telework.

To have a better understanding of the relationship between telecommuting and psychological well-being, the self-determination theory (SDT) is elaborated in this research. In this theory it is argued that the fulfilment of the need for autonomy, relatedness and competence, positively influence the level of psychological well-being (Ryan & Deci, 2001). In the literature on telecommuting and psychological well-being the increase in autonomy comes forward regularly, as well as the decrease in relatedness due to less social contacts (Hager, 2018; Kniffin et al., 2020; Mogilner et al., 2018; Galanti et al., 2021). To have more insight in the indirect effects of the need for autonomy, relatedness and competence, these concepts are added individually in this research as a mediator between telecommuting and psychological well-being.

At last, the importance of leaders must not be underestimated to safeguard the psychological well-being of employees (Bauwens et al., 2021). A leadership style that gained popularity since the shift to telework is empowering leadership *(*Bauwens et al., 2021; Stoker et al., 2021). Empowering leadership corresponds well with the decrease in face-to-face contact between employees and supervisors due to telecommuting (Coun et al., 2021). An empowered leader emphasizes the importance of encouraging and enabling followers to lead themselves (Albrecht & Andreetta, 2011). Moreover, literature shows that empowering leadership positively influences psychological well-being (Joo et al, 2016; Park et al., 2017). As a consequence, having an empowered leader potentially enhances employees' psychological well-being in a telecommuting context as well. Therefore, this research examines if the degree of experienced empowered leadership moderates the relation between telecommuting and psychological well-being.

In this paragraph will be elaborated why research on this topic is necessary. Before the pandemic, telecommuting was assumed to have negative influences on psychological well-being of employees (Hager, 2018). Since many organizations around the world were forced to shift to telecommuting it is relevant to know if this negative relation is still applicable or not. Next to that, research about the indirect effects of the fulfilment of autonomy, relatedness and competence could give a better understanding of the relation between telecommuting and employees' psychological well-being. Furthermore it could give more insight in how this relation could be improved, which is needed according to Jamal et al. (2021). Subsequently, the role of an empowered leader in this relation is analysed. Although a positive relationship between empowering leadership and psychological well-being was measured before COVID-19 in a non-telecommuting context (Park et al., 2017), this current research investigates if this positive effect is still present in the COVID-19 and telecommuting context. At last, there is a scarcity of studies on the interaction effect of empowering leadership in the relation between telecommuting and psychological well-being which gives reason for examination.

Taking the above in consideration, the purpose of this thesis is twofold. Primarily, thesis tries to generate more knowledge about the effects of telecommuting on psychological well-being mediated

by autonomy, relatedness and competence. Secondly the influence of an empowering leader is analysed in the relation between telecommuting and psychological well-being. This research will be done by answering the following research question:

To what extent does telecommuting due to COVID-19 influence psychological well-being and is this mediated by autonomy, relatedness and competence (SDT)? To what extent is the relationship between telecommuting and psychological well-being moderated by empowering leadership?

By answering this question this thesis contributes to the field of HRM by examining the effects of telecommuting due to COVID-19 on psychological well-being. According to Chai and Park (2022) this topic is still under-researched in a telecommuting context, despite the importance of employees' psychological well-being for organizations (Hager, 2018). The shift to telework, and the increase in empowering leadership that came with, is relatively new on this scale and for that reason scientific knowledge on this topic is limited (Stoker et al., 2021). Scientific knowledge on this subject is relevant, taking in consideration that it is assumed that telecommuting will remain important (Bauwens et al., 2021). Next to that, this research contributes to practice in several ways. To start with, it can give (HR) managers or supervisors a better insight into the effect of telecommuting on psychological well-being. Secondly, it can contribute to help (HR) managers or supervisors in their leadership behavior towards a workforce that telecommutes (Liao, 2017). As a third, (HR) managers or supervisors inside organizations can develop practices and integrate these findings in their leadership program or management training. At last, it can help leaders to learn more about how employees experience empowering leadership behavior during telecommuting to safeguard employees' psychological well-being (Kim et al., 2018).

Theoretical Framework

COVID-19 & Telecommuting

COVID-19, which started in March 2020, impacted many lives and had disruptive and exceptional consequences that no one had ever seen before, such as lockdowns and social isolation (Zhang et al., 2020). In general, the COVID-19 pandemic can be seen as a crisis and uncertain period for organizations (Bartsch, 2021). The consequences of the virus were unpredicted and forced organizations in decision-making situations they normally would not be in. One of the challenges that came out of the COVID-19 pandemic was that organizations were forced to send their employees home to telecommute from there (Zhang et al., 2020). Allen et al. (2015) conceptualized telecommuting as: "a practice that allows employees to work from home for part of the week and stay connected to the office via communication technologies'' (p. 44). In fact, telecommuting overlaps with the definition of working in virtual teams, which is defined as work practices where team members are geographically dispersed, have limited face-to-face contact, and work interdependently through the use

of electronic communication media to achieve common goals (Bell & Kozlowski, 2002). The definition by Allen et al. (2015) will be used as the central definition, supported by the definition of working in virtual teams composed by Bell and Kozlowski (2002). Key characteristics for telecommuting are working from home part of the week and connecting via communication technologies. Main positive outcomes from telecommuting are an increase in productivity (Curran, 2021; Algrari, 2017) and flexibility in time and work location (Beckel & Fisher, 2022) which can facilitate a balance in employees' work and private life (Liao, 2017). In opposite, the most challenging outcome of telecommuting is less face-to-face contact between employees and employers which can result in social isolation (Kniffin et al., 2020; Beckel & Fisher, 2022). Altogether, many employees had to deal with the uncertain COVID-19 context, the increase in telecommuting and the outcomes that came with it. These outcomes in turn have their effects on the well-being of employees.

Telecommuting and psychological well-being

For organizations and employees alike, employee well-being is important in today's enterprises. An organizational change like the forced telecommuting, unavoidably influences employees' well-being (Beckel & Fisher, 2022). Central in this section is the relationship between telecommuting and psychological well-being in the context of work. Using the hedonic approach, psychological well-being can be described as the subjective judgements of feelings of well-being (Ryan & Deci, 2001). It focuses on finding a balance in an individual's judgement between the positive and negative feelings and thoughts. It is based on the idea that happiness is achieved by increasing pleasure and decreasing misery. High levels of psychological well-being can lead to positive outcomes in an individuals' personal life as well as positive organizational outcomes. Therefore, the interest from organizations for psychological well-being is growing.

To have a better understanding in the relation between telecommuting and psychological well-being the Job-Demand-Control (JDC) model (Karasek, 1979) is helpful. The JDC model, also referred to as Job-Strain-Model, tells us that high work demands in combination with limited decision-making possibilities can lead to psychological and physical stress, as well as job unhappiness (Karasek, 1979). In contrast, high work demands in combination with unlimited decision-making, can increase well-being, stimulate learning and personal development of employees (Karasek & Theorell, 1990). Johnson and Hall (1988) added a social component to the JDC model. The JDC-S model claims that social integration at the workplace is crucial and if not well implemented can increase mental health problems.

When looking at the shift to telecommuting in perspective of the JDC-S model we see both positive as well as negative effects on job strain in the literature. On the one hand, working remotely or away from the office provides employees with a great amount of independence and freedom, implying that telework may decrease job strain (Jamal et al., 2021, Brunelle & Fortin, 2021). On the other hand, telecommuting is aligned with other characteristics that will possibly increase job strain.

For example, telecommuting is associated with the decrease in boundaries between work and home, increasing the likelihood of work-family-conflict (Mann & Holdsworth, 2003). Next to that, telecommuting is associated with inadequate workplaces which increases the risk of pain symptoms coming from unergonomic workplaces (Montreuil & Lippel, 2003). As a third, telecommuting is associated with a decrease in emotional connectedness to co-workers and managers (Johnson et al., 2009).

Taking these job strains in consideration, next to the JDC-S model that argues for the crucial integration of social contact at work, it is assumed that psychological well-being is endangered by telecommuting. Therefore the following hypothesis is formulated:

H1: Telecommuting will negatively influence psychological well-being

The mediating role of autonomy, relatedness and competence (SDT)

Another theory that can give a better understanding of the relationship between telecommuting and psychological well-being is self-determination theory. This theory suggests that the level of well-being of an employee is dependent on the satisfaction of three basic psychological needs (Ryan & Deci, 2001). If the three needs – autonomy, relatedness and competence – are fulfilled, this will result in better self-motivation and mental health will increase. In contrary, if they are hindered, reduced motivation and well-being will occur (Ryan & Deci, 2001). Taking in consideration that the fulfilment of these three needs positively influence psychological well-being, this research will examine if these needs indirectly effect the relationship between telecommuting and psychological well-being. Therefore, all three needs are elaborated and the indirect effects are measured.

To start with, the need for autonomy is examined in this context. Autonomy refers to the free engagement in interesting activities (Ryan & Deci, 2001). Working remotely or away from the office generally provides employees with more flexibility and autonomy. Individuals are given more control in terms of when, where and how they carry out their tasks (Jamal et al., 2021). Baltes et al. (1999) discovered that interventions that boost an employees' autonomy result in a higher alignment between employee demands and the working environment, as well as increased psychological well-being. A recent study from Galanti et al. (2021) corresponds with that, where it is being argued that working from home due to the pandemic is positively related to autonomy. As a result, in this research the indirect effect of autonomy between telecommuting and psychological well-being is assumed to be positive. Therefore the following hypothesis is formulated:

H2a: Telecommuting will positively influence autonomy and therefore positively influence psychological well-being

Secondly, the need for relatedness is examined in this context. Relatedness refers to feeling closely and securely connected to significant others (Ryan & Deci, 2001). Telecommuting or working from home generally leads to an increased difficulty to interact effectively with co-workers and

managers (Bailey & Kurland, 2002). Next to that, Johnson et al. (2019) argue that telecommuting is linked to a decrease in emotional attachment to colleagues and supervisors, which in extreme forms can cause social isolation. Previous research by Mogilner, Whillans and Norton (2018) confirm that social interactions have been found to be essential for psychological well-being. Therefore the fulfillment of the need to be related in the self-determination theory is of importance. On top of that, the indirect effect of a decreased fulfilment of the need for relatedness was also mentioned by Kniffin et al. (2020). They argue that the negative impact is possibly related to social distancing and uncertainty that came with the pandemic. Taking this in consideration, it is assumed that telecommuting negatively influences the fulfilment of the need to be related. Therefore in this research the indirect effect of relatedness between telecommuting and psychological well-being is assumed to be negative. This is tested using the following hypothesis:

H2b: Telecommuting will negatively influence relatedness and therefore negatively influence psychological well-being

Thirdly, the need for competence is examined in this context. Competence refers to producing valued outcomes via the use of an individual's capacities (Ryan & Deci, 2001). Working away from the office changes the way work is done and can make work more challenging (Eddleston & Mulki, 2017). From this point of view telecommuting satisfies the need for competency. Next to that, according to Algrari (2017) telecommuting allows individuals to be more productive because it enables them to work when their creativity is high, and lower distractions are experienced in comparison to the traditional office environment. An increase in creativity and a decrease in distractions offers an opportunity for employees to better use their capacities and produce higher valued outcomes. Therefore in this research the indirect effect of competence between telecommuting and psychological well-being is assumed to be positive. This is tested using the following hypothesis:

H2c: Telecommuting will positively influence competence and therefore positively influence psychological well-being

Empowering Leadership and psychological well-being

In this paragraph the relation between empowering leadership and psychological well-being will be discussed. An empowering leader emphasizes the importance of encouraging and enabling followers to lead themselves (Albrecht & Andreetta, 2011). Conger and Kanungo (1988) argued that empowerment is more than just delegating power to the employee; it is a motivational process. As a result, a leader must help team members understand the importance of their responsibilities in the team and involve them in the decision-making process (Ahearne et al., 2005). Empowering leadership is defined by Srivastava et al. (2006) as behaviours in which power is delegated to team members, hence increasing intrinsic motivation among all members. Behaviours that align with empowering leadership are the encouragement of independent action, self-development and opportunity thinking (Pearce & Sims, 2002).

To have a better understanding of the relationship between empowering leadership and psychological well-being we can use the leader-member exchange (LMX) theory. In this theory it is argued that leaders can influence employees through the relationship that they develop with them (Erdogan & Bauer, 2015). High quality relationships are based on trust, mutual respect and liking of each other. In high-quality relationship, leaders provide support for development, coaching and other benefits to the employee (Erdogan & Bauer, 2015). Treating employees with respect and demonstrating concern for them through consulting and coaching, fosters a trusting and supportive environment (Kim et al., 2018). These benefits in turn have a positive effect on the level of psychological well-being (Kim et al., 2018). As a result, it is argued that the level of psychological well-being is influenced by the relationship between leader and follower (Hassan et al., 2013).

In previous research on the relationship between empowering leadership and psychological well-being it is argued that an empowered leader has the ability to improve employee well-being (Kim et al., 2018). Next to that, Conger and Kanungo (1988) argued that empowering experiences in employment directly influence the psychological mood of the employees. Being empowered, results in having a positive state of mind and having the autonomy to achieve goals according to Coun et al. (2021). Having this positive state of mind makes an employee feel confident and increases the pleasure at work. Consequently, increasing pleasure leads to positive feelings and thoughts, which are indicative for an individual's psychological well-being (McGregor & Little, 1998). As a result, the positive relationship between empowering leadership and psychological well-being was shown by Park et al. (2017) who investigated the effect of empowering leadership on employees' psychological well-being, mediated by psychological capital. Next to that, Joo et al. (2016) investigated the relation between empowering leadership and psychological well-being as well. Their analysis on knowledge workers in large professional service firms in Korea found that empowering leadership was positively correlated to psychological well-being.

Therefore, on the basis of both the LMX theory and the existing studies mentioned above it is assumed that empowering leadership positively influences the psychological well-being of employees. This will be tested using the following hypothesis:

H3: Empowering leadership will positively influence psychological well-being

The moderation effect of empowering leadership on the relationship between telecommuting and psychological well-being

In this paragraph the moderating role of empowering leadership is examined in the relation between telecommuting and psychological well-being. To have a better understanding of the assumption that empowering leadership moderates this relation, it is important to take a step back. As previously discussed, research on the relationship between telecommuting and psychological well-being, in general suggests negative effects because of job strain (Hager, 2018; Mann & Holdsworth, 2003; Montreuil & Lippel, 2003; Johnson et al., 2009; Jamal et al., 2021; Beckel & Fisher, 2022).

Nevertheless, in some researches positive relations are being argued (Brunelle & Fortin, 2021; Jamal et al., 2021). This gives a reason to assume that there is a moderator. Generally the most positive outcome of working from home is the freedom and flexibility provided by the organization to choose how, when and where to work (Jamal et al., 2021). In contrast, it is argued that too much freedom and flexibility provided by the organization can result in job strain because it requires more cognitive effort and can lead to distraction from work (Beckel & Fisher, 2022). The freedom and flexibility that comes with telecommuting can have positive effects when employees are trusted by their supervisor and are encouraged to make their own decisions (Jamal et al., 2021). Being trusted by a leader and being encouraged in decision making are characteristics that align with empowering leadership (Ahearne et al., 2005; Kim et al., 2018). This assumes that when employees experience a high degree of empowering leadership while telecommuting, their psychological well-being will be positively influenced. In contrast, when an employee telecommutes but is being controlled by their leader and not being trusted in decision making, this negatively influences psychological well-being. Therefore, empowering leadership is examined as a moderating variable in the following hypothesis:

H4: Empowering leadership moderates the association between telecommuting and psychological well-being in such a way that when employees experience a high degree of empowering leadership, the association between telecommuting and psychological well-being will be strengthened.

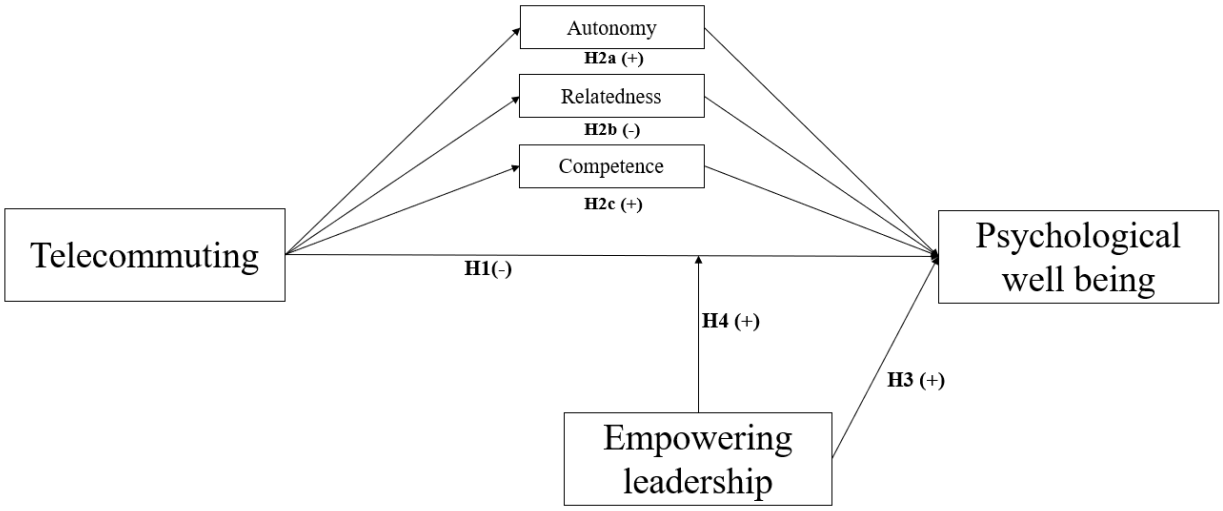

Figure 1: Research model

Method

Research design

This quantitative research aims to understand the relation between telecommuting and psychological well-being, the indirect effects of the need for autonomy, relatedness and competence (SDT), and the moderation effect of empowering leadership. The level of analysis in this study is individual employees. Respondents are approached based on convenience sampling and snowball sampling (Emerson, 2015). It is a deductive quantitative study since the research is theory-driven from which hypothesis are elaborated and tested by SPSS (Field, 2018). The research is cross-sectional, which indicates that the data was gathered at one point in time in order to test the hypothesis (Field, 2018). Data was gathered at the end of April until the start of May 2022. The questionnaire was distributed digitally, using the program Qualtrics. Before respondents could start filling out the questionnaire, they were provided additional information about the research to assure informed consent. In the introduction, the confidentiality of the results was addressed and respondents were informed that the questionnaire results would only be utilized for the study's purposes. The consent form can be found in Appendix A.

Sample

The respondents that were needed for this research are especially employees that telecommute due to COVID-19 and experience different degrees of empowering leadership. Since many organizations were forced to telecommute due to the pandemic, respondents were easily accessible. Convenience sampling was used to collect data in a way that the questionnaire was spread in the researchers' own network. In turn, snowball sampling was used where participants shared the survey in their network (Emerson, 2015). The questionnaire was designed and distributed by two master students, who collaborated in the data gathering. This means that not all questions in the questionnaire were relevant for this particular study. The irrelevant questions were excluded from the data. Participants were recruited through the researchers' own networks, and the questionnaires were distributed across several online platforms (e.g., Facebook and LinkedIn) in order to obtain as many responses as feasible. Data was gathered through an online questionnaire in Qualtrics, in which anonymity was guaranteed. Furthermore, the questionnaire featured a clear introduction that stated its aim as well as the estimated time it would take to complete the questionnaire, which was around 8-10 minutes. The data gathering period was about 3 weeks long. Appendix A provides the questionnaire that contains the questions for this particular study.

Demographics

The questionnaire was in total completed by 154 persons. The sample has 131 respondents after excluding those who did not complete the required information for this particular study. One of the requirements was to have a direct supervisor or manager. Sixteen respondents that did not have a direct supervisor were removed from the sample. Seven respondents did not answer more than 25% of the questions and were removed as well.

Employees from the Netherlands (78.6%, *N* = 103) and India (15.3%, *N* = 20) make up the majority of the sample. Some respondents from other nations, such as Italy, Mexico, South-Korea, and Colombia, also completed the survey. The population was on average 29.62 years (*SD* = 8.84) and had worked for their current employer for an average of 3.15 years (*SD* = 4.78). The survey was filled in by slightly more men (50.4%, *N* = 66) than women (49.6%, *N* = 65). The majority of those who responded went to university or the higher vocational education (HBO), respectively 55.7% and 38.2%. The descriptive statistics of the sample are shown in Appendix 2, Table 1.

In the survey it was questioned to what extend the respondents worked from home before, during and after the COVID pandemic. The descriptive statistics of the sample in terms of working from home are shown in Appendix 2, Table 2. Respectively 45.19% (*SD* = 28.60) of the sample population work from home since the end of April 2022, considered after COVID in this research. Additionally, questions about the employees' workplace at home resulted in less than half of the population having an ergonomic chair (40.5%, *N* = 53) and three quarter using a monitor screen (75.6%, *N* = 99). Furthermore in Appendix 2, Table 3 the descriptive statistics of the sample are shown which represent the scores of having a partner, roommate or child(ren) at home while telecommuting, and in what degree they cause interruptions while telecommuting.

Measuring instruments

To measure the constructs in this research, verified scales were used. Exploratory factor analysis is performed on psychological well-being, autonomy, relatedness and competence, and empowering leadership to determine construct validity. This indicates that the structure of the relationships between the items on each scale was examined (Hair et al., 2015). The scales were evaluated based on Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (>.5), Bartlett's Tests of Sphericity (p<.05), eigenvalue (>1), explained variance (>60%), and the scree plot (Field, 2018). A reliability analysis was performed by using Cronbach's Alpha (>0.7) as a measure and criterion (Field, 2018). The variables of telecommuting and the control variables are an exception since these are (binary) single variables.

Telecommuting. The concept of telecommuting was measured using the question: "To what extent are you working from home after COVID-19,'' considering that the pandemic was (almost) over at the time of measuring. Answer options were possible from 0% to 100%. The percentage that was filled in was used in the analysis, making this variable ratio. To have a better understanding of the population sample and to check for control variables, it was questioned whether the employee had a responsible workplace at home. This responsible workplace regards the attendance of a desk, monitor screen, ergonomic chair, keyboard and/or daylight. Next to that it was questioned whether there is a partner, roommate or child(ren) present in the house while working from home and if present, if they cause interruptions during their work. These questions were asked to see if differences are notable.

Autonomy, relatedness and competence. These needs represent the Self-Determination Theory, which were measured using the existing scales of Deci and Ryan (2000) called the Basic Psychological Needs Scales. This scale consists of 21 items to measure autonomy, relatedness and competence. Three subscales are formed for the degree to which the participant experiences satisfaction of each of the three needs. A seven-point Likert scale was used, ranging from 1 (not at all true) to 7 (very true). Some of the items in this scale are negatively worded and therefore needed to be reversed. A sample item for autonomy is: "I feel like I am free to decide for myself how to live my life''. A sample item for relatedness is: "The people I interact with regularly do not seem to like me much''(Reversed). At last, a sample item for competence is: "In my life I do not get much of a chance to show how capable I am''. Ultimately, the mean score per subscale for each respondent indicates the level of respectively autonomy, relatedness and competence.

On this scale the factor analysis is performed per component: autonomy, relatedness and competence. The reason for this is because they are analyzed individually like separate variables. At first, the factor analysis on the subscale 'autonomy' showed a KMO value of 0.804, which is higher than the necessary 0.5. Bartlett's Test of Sphericity was significant ($p < .001$). The communalities ranged from 0.215 to 0.575, which all are above .20. The factor analysis gave one component based on the eigen values (2.952) and the scree plot. This factor explained 42,2% of the variance. After that, a reliability analysis was performed, providing a Cronbach's alpha of .758, indicating strong reliability (Field, 2018).

Secondly, the factor analysis on the subscale 'relatedness' showed a KMO value of 0.773, which is higher than the necessary 0.5. Bartlett's Test of Sphericity was significant ($p < .001$). The communalities ranged from 0.411 to 0.696, which all are substantially above .20. The factor analysis gave one component based on the eigen values (3.139) and the scree plot. This factor explained 39,2% of the variance. The component matrix gave an extraction of two components, but since this is an validated scale it is chosen to continue with only one component. After that, a reliability analysis was performed, providing a Cronbach's alpha of .748, indicating strong reliability (Field, 2018).

At last, the factor analysis on the subscale 'competence' showed a KMO value of 0.751, which is higher than the necessary 0.5. Bartlett's Test of Sphericity was significant ($p < .001$). The communalities ranged from 0.374 to 0.827, which all are substantially above .20. The factor analysis gave one component that explained 42.6% of the variance based on the eigenvalues(2.558) and the scree plot. The component matrix gave an extraction of two components, but since this is an validated scale it is chosen to continue with only one component. After that, a reliability analysis was performed, providing a Cronbach's alpha of .721, indicating strong reliability (Field, 2018).

The Cronbach's alpha for the total general scale was .878, indicating that the general scale and subscales were both reliable. The questionnaire can be found in Appendix 1.

Psychological well-being. Psychological well-being was measured using the existing scales from the Manual Questionnaire Perception and Judgement of Work by van Veldhoven, Meijman, Broersen and Fortuin (2002). Psychological well-being was measured by using the scale 'pleasure at work'. This research focuses solely on the questions related to psychological well-being and exists of 6 items. Sample items for each include "I still find my work stimulating each and every day" and "I enjoy my work". A seven-point Likert scale was used, ranging from 1 (strongly disagree) to 7 (strongly agree). Some of the items in this scale are negatively worded and therefore needed to be reversed, respectively item two, three, four and six. Ultimately, the mean score on this subscale for each respondent indicates the level of psychological well-being; the higher the score, the higher the level of psychological well-being for that respondent.

The exploratory factor analysis showed a KMO value of 0.823, which is higher than the necessary 0.5. Bartlett's Test of Sphericity was significant ($p < .001$). The communalities ranged from 0.360 to 0.729, which all are substantially above .20. The factor analysis gave one component that explained 56,4% of the variance based on the eigenvalues(3.385) and the scree plot. After that, a reliability analysis was performed, providing a Cronbach's alpha of .827, indicating strong reliability (Field, 2018). The questionnaire can be found in Appendix 1.

Empowering leadership. The concept of empowering leadership was measured using the existing 6 item scale from Pearce and Sims (2002). These scales are respectively encourage self-reward, encourage teamwork, participative goal setting, encourage independent action, encourage opportunity thinking and encourage self-development. A sample item is "my supervisor encourages me to seek solutions without his/her direct input.''. A seven-point Likert scale was used, ranging from 1 (strongly disagree) to 7 (strongly agree). Ultimately, the mean score on this subscale for each respondent indicates the level of perceived empowering leadership; the higher the score, the higher the level of perceived empowering leadership for that respondent.

On this scale, the exploratory factor analysis showed a KMO value of 0.795, which is higher than the necessary 0.5. Bartlett's Test of Sphericity was significant ($p < .001$). The communalities ranged from 0.342 to 0.674, which all are above .20. The factor analysis gave one component that explained 54% of the variance based on the eigenvalues (3.233) and the scree plot. After that, a reliability analysis was performed, providing a Cronbach's alpha of .827, indicating strong reliability (Field, 2018). The questionnaire can be found in Appendix 1.

Control variables. The following control variables were included in the analyses to check for possible effects of biographical characteristics, to confirm the validity of the research and to adjust for spuriousness: age, gender, nationality and educational level. Gender can have a significant positive relationship with the level of psychological well-being suggesting that self-acceptance and autonomy might be scored higher by men than women (Matud et al., 2019). In contrary, women scored higher than men in personal growth and positive relations with others (Matud et al., 2019). Age can have a significant positive relationship with the level of psychological well-being suggesting that self-

acceptance might be more easily achieved by the aged than by younger people (Ryff & Keyes, 1995). But not all aspects of psychological well-being are positively related to age. In contrary, personal growth and purpose in life decreased (Ryff & Keyes, 1995). Nationality was asked since the survey is spread internationally and therefore international responses are included. Nationality is included despite the fact that race and ethnicity does not account for better or worse psychological well-being (Chang et al., 2014).

Research ethics

While conducting this study, various ethical factors were considered. All information submitted by the respondents was treated discreetly, as advised by Sekaran and Bougie (2016). The introduction section of the questionnaire was used to assure respondents that their responses would be kept private and that they would be able to withdraw from their participation at any time. The researchers made the questionnaire anonymous to protect respondents' privacy, which meant they didn't have to fill in their name or any other personal information that could be linked to a specific individual. Furthermore, informed consent was obtained from the respondents, since they were required to give permission for their responses to be used for academic reasons before they could complete the survey. The participants were not forced to respond to any questions they did not like to respond to since it is unethical to force someone to participate in a study (Sekaran & Bougie, 2016). Finally, the researcher did not interfere with the collected data in any way (Sekaran & Bougie, 2016). To be able to thoroughly analyze the dataset, only minor and essential alterations have been done.

Analysis

All of the collected data was analyzed using the IBM SPSS statistics software. To start with, the dataset was prepared for analysis. The data was screened for missing values, outliers and duplicates. The option 'frequencies' in SPSS was used to check for missing values and outliers (Field, 2018). In case missing data for each variable was below the 10-15% it could be ignored (Field, 2018). Besides, no outliers were found. After performing the factor analysis, the regression analysis was conducted.

To test hypothesis 1 and 3, regarding the direct relationship between telecommuting and psychological well-being (H1) and the direct relationship between empowering leadership and psychological well-being (H3), regression analysis was used. To confirm the hypotheses, the relationships need to be significant ($p < .05$).

To test hypothesis 2a, 2b and 2c, regarding the indirect effect of autonomy, relatedness and competence on the relationship between telecommuting and psychological well-being, a mediated regression analysis was performed using the SPSS add-on PROCESS model 4 (Hayes, 2013). To confirm the hypothesis, the indirect effect needed to be significant ($p < .05$).

To test hypothesis 4, regarding the moderating effect of empowering leadership, a moderated multiple regression analysis was performed using the SPSS add-on PROCESS model 1 (Hayes, 2013).

Since PROCESS standardizes all variables to make analysis of the data easier and to avoid multicollinearity and homoscedasticity, there is no need to test assumptions (Hayes, 2013).

Results

In this paragraph the findings of this study will be elaborated. The means, standard deviations and the correlations of the included variables are analyzed and discussed to gain a better understanding of the data. After that, the hypotheses will be discussed as well as the additional analysis.

Descriptive statistics

In Table 4 the means, standard deviations and the correlations of the included variables are shown. When looking at the correlations, it appears that there are multiple significant correlations between the variables in this study ($p < .05$). A significant correlation indicates a statistical relationship between two variables, but without causality (Field, 2018). To start with, in this data set telecommuting is not directly significantly correlated with psychological well-being ($r = .127$, $p = .17$). However, telecommuting does significantly correlate with autonomy ($r = .205$, $p < .05$) and relatedness ($r = .329$, $p < .01$), which both as well significantly correlate with psychological well-being. In contrast, telecommuting does not significantly correlate with competence ($r = .116$, $p = .20$), while competence does significantly correlate with psychological well-being ($r = .616$, $p < .01$). When we look at the moderator in this study – empowering leadership – we see multiple significant correlations. To start with, the data suggests that telecommuting significantly correlates with empowering leadership ($r = .261$, $p < .01$). Next to that, empowering leadership directly correlates significant with psychological well-being ($r = .447$, $p < .01$). Regarding the control variables, age is significantly positive correlated with psychological well-being ($r = .278$, $p < .01$). Next to that the work experience of the participants also correlates significantly positive with psychological well-being ($r = .242$, $p < .01$). The total work experience correlates significant positively with autonomy ($r = .215$, $p < .05$). Control variables that have had no significant correlations at all were removed. Control variables related to working from home that were asked in the survey were the presence of a partner, roommate or child(ren) while working from home, and to what frequency there were interruptions from a partner, roommate or child(ren). The presence of, and interruptions from, a partner and child(ren) did not lead to significant correlations and were therefore removed. Nonetheless, as shown in Table 4, the presence of a roommate while working from home has a significant negative correlation with psychological well-being ($r = -.322$, $p < .05$). The same significant negative correlation is valid between the presence of a roommate while working from home and autonomy ($r = -.302$, $p = < .05$) and competence ($r = -.383$, $p = < .01$). The frequency of interruptions by a roommate while working from home has a significant negative relation with psychological well-being ($r = -.322$, $p < .05$), autonomy ($r = -.462$, $p < .01$) and relatedness ($r = -.385$, $p < .01$).

Table 4: Means, standard deviations and correlations of the included variables

	Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Telecommuting	45,2	28,6	1									
2. Psychological Well-being	4,6	1,2	0,127	1								
3. Empowering Leadership	5,3	1,0	,261**	,447**	1							
4. Autonomy	5,0	0,8	,205*	,524**	,334**	1						
5. Relatedness	5,6	0,8	,329**	,373**	,366**	,565**	1					
6. Competence	5,1	0,8	0,116	,616**	,368**	,715**	,554**	1				
7. Age	29,6	8,8	0,096	,278**	0,087	,242**	0,122	,218*	1			
8. Nationality[1] [2]	-	-	-0,136	-,303**	-0,081	-,481**	-,460**	-,441**	-,314**	1		
9. Total Work Experience	7,4	8,8	0,069	,242**	0,079	,215*	0,059	,207*	,933**	-,222*	1	
10. Presence roommate while WFH	2,8	1,5	-0,026	-,322*	-0,141	-,302*	-0,209	-,383**	-,472**	,415**	-,436**	1
11. Interruptions roommate while WFH	2,0	1,0	-,368*	-,322*	-0,182	-,462**	-,385**	-0,268	-,379**	0,290	-0,275	,623**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

[1] Nationality was coded 0 (Dutch) and 1 (Other)

[2] Nationality has no ratio scale and therefore has no mean and standard deviation

Hypothesis testing

First, according to Hypothesis 1, telecommuting was expected to negatively influence psychological well-being. Despite this expectation, no significant correlation was found between telecommuting and psychological well-being, as indicated in Table 5 (b = .127, p = .17). Therefore, Hypothesis 1 is not supported. Furthermore, according to Hypothesis 2 it was expected that autonomy, relatedness and competence have an indirect effect in the relation between telecommuting and psychological well-being. Specifically, according to Hypothesis 2a it was expected that telecommuting would positively influence autonomy and therefore positively influence psychological well-being. In line with this the data has shown that telecommuting positively and significantly correlates with autonomy (b = .205, p = .022). Autonomy as a mediator correlates significantly with psychological well-being (b = .752, p < .000). Therefore, Hypothesis 2a is supported. Secondly, in Hypothesis 2b it was expected that telecommuting would negatively influence relatedness which would have a negative influence on psychological well-being. Despite this expectation the data has shown that telecommuting correlates significant and positive with relatedness (b = .329, p < .000). Next to that, relatedness as a mediator correlates significantly with psychological well-being (b = .600, p = < .000). Therefore, Hypothesis 2b is not supported. As a third, Hypothesis 2c expects telecommuting to positively influence competence, which therefore will influence psychological well-being positively. No significant correlation was shown in the data between telecommuting and competence (b = .116, p = .199). Competence as a mediator correlates significantly positive with psychological well-being (b = .907, p = < .000). Therefore, Hypothesis 2c is not completely supported. After this, the variable empowering leadership was added to the analysis. According to Hypothesis 3 it was expected that an high level of perceived empowering leadership will positively influence the level of psychological well-being. In line with this the data has shown that empowering leadership positively and significantly correlates with psychological well-being (b = .447, p < .000). Therefore, Hypothesis 3 is supported. In Table 6 the results are shown of the direct effects (a-paths and b-paths) and the indirect effects (c'-paths).

Table 5: Results of the linear regression

Outcome: Psychological Well-being			
Model Summary: F = 18.675, p < .00, R^2 = .395			
Predictors	***b***	**SE**	***p***
Telecommuting	.127	.004	.166
Empowering Leadership	.447	.099	.000

Table 6: Results of the direct effects (a-paths and b-paths) and the indirect effects (c'-paths)

Relationship between telecommuting and mediators (a-paths)				
Mediators	***b***	**SE**	**t**	***p***
Autonomy	.205	.003	2.319	.022
Relatedness	.329	.002	3.868	.000
Competence	.116	.003	1.291	.199

Relationship between mediators and psychological well-being (b-paths)				
Mediators	***b***	**SE**	**t**	***p***
Autonomy	.524	.053	6.855	.000
Relatedness	.373	.052	4.474	.000
Competence	.616	.049	8.718	.000

Indirect effect of the mediators between telecommuting and psychological well-being (c'-paths)				
Mediators	***b***	**SE**	**t**	***p***
Autonomy	.752	.119	6.313	.000
Relatedness	.600	.149	4.030	.000
Competence	.907	.109	8.355	.000

In Hypothesis 4 an interaction effect was predicted of empowering leadership on the relationship between telecommuting and psychological well-being. This effect is shown in Table 7. Hypothesis 4 stated that empowering leadership positively moderates the relationship between telecommuting and psychological well-being, in a way that the relationship is more positive when a high degree of empowering leadership is experienced comparing with a low degree of empowering leadership. The results presented in Table 7 show that the interaction effect is very small and not significant, which therefore rejects Hypothesis 4. Figure 2 provides a visual representation of the found relationships.

Table 7: Results for moderation analysis with moderator empowering leadership

Outcome: Psychological well-being			
Model summary	**R2**	**F**	***p***
	.496	1.541	.1881
Predictor variable	***b***	**SE**	***p***
Telecommuting	-.003	.007	.685
Empowering Leadership	.382	.177	.038
Telecommuting x Empowering Leadership	.002	.005	.748
Age	.035	.070	.624
Work Experience	-.051	.065	.433
Presence while working from home: roommate	-.165	.182	.371
Interruptions while working from home: roommate	-.161	.265	.549

N = 131

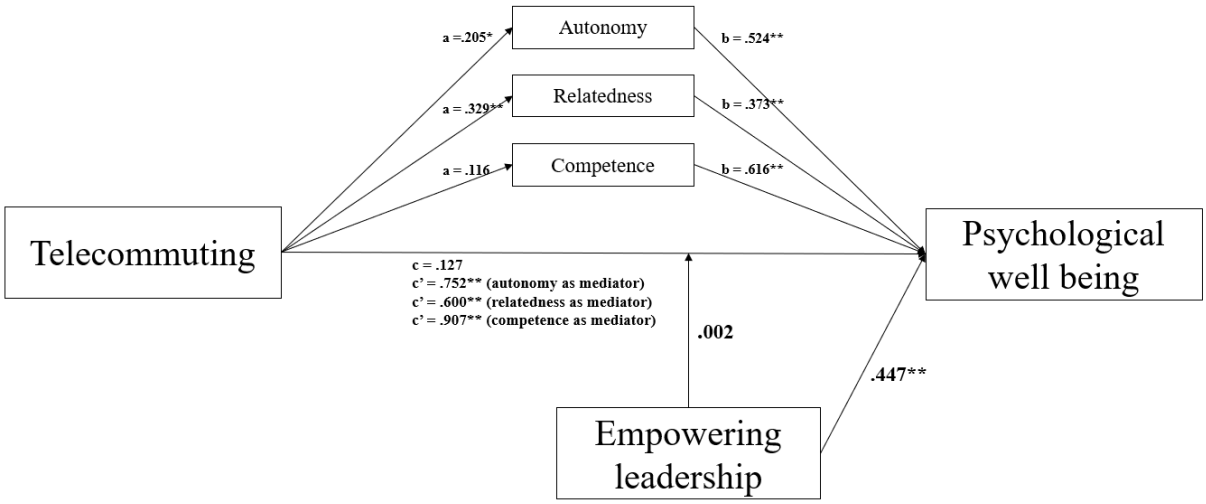

Figure 2. The statistical model for mediation and moderation with regression coefficients
Note. * = $p < .05$, ** = $p < .001$.

Additional analysis

Telecommuting did not significantly correlate with psychological well-being (b = .127, p = .17) and was therefore excluded in this additional analysis. The analysis already showed that empowering leadership directly correlates with psychological well-being (b = .447, p = .000). The more empowering leadership is experienced, the higher the level of psychological well-being will be. To have a better understanding of this relation, an extra linear regression is executed with the needs from the self-determination theory, which shows that empowering leadership directly correlates with autonomy (b = .334, $p < .01$), relatedness (b = .366, $p < .01$) and competence (b = .368, $p < .01$). To control if the positive relation between empowering leadership and psychological well-being is mediated by autonomy, relatedness and competence, a mediating analysis was carried out. This is shown in Table 8. It shows that either autonomy (b = .597, $p < .01$), relatedness (b = .377, $p < .01$) as well as competence (b = .748, $p < .01$), have a significant indirect effect.

At last, as an additional analysis it is chosen to combine the variables autonomy, relatedness and competence, into one, together forming the Self-Determination Theory (SDT) The Cronbach's alpha for the total SDT scale is .878, indicating that the scale is reliable. To examine whether SDT as a whole has a significant correlation with psychological well-being, SDT is examined as the mediating variable. These results are visible in Table 8. From this analysis it can be concluded that empowering leadership significantly correlates with psychological well-being, mediated by SDT (b = .839, $p <$ .01). Figure 3 provides a visual representation of the found relationships.

Table 8: Additional analysis: results of the direct effects (a-paths and b-paths) and the indirect effect (c'-paths)

Relationship between empowering leadership and mediators (a-paths)				
Mediators	**B**	**SE**	**t**	**P**
Autonomy	.334	.071	3.977	.000
Relatedness	.366	.062	4.415	.000
Competence	.368	.070	4.442	.000
SDT	.410	.057	5.052	.000

Relationship between mediators and psychological well-being (b-paths)				
Mediators	**B**	**SE**	**t**	**P**
Autonomy	.524	.053	6.855	.000
Relatedness	.373	.052	4.474	.000
Competence	.616	.049	8.718	.000
SDT	.589	.125	8.116	.000

Indirect effect of the mediators between telecommuting and psychological well-being (c'-paths)				
Mediators	**B**	**SE**	**t**	**P**
Autonomy	.597	.113	5.275	.000
Relatedness	.377	.138	2.735	.007
Competence	.748	.105	7.096	.000
SDT	.839	.135	6.190	.000

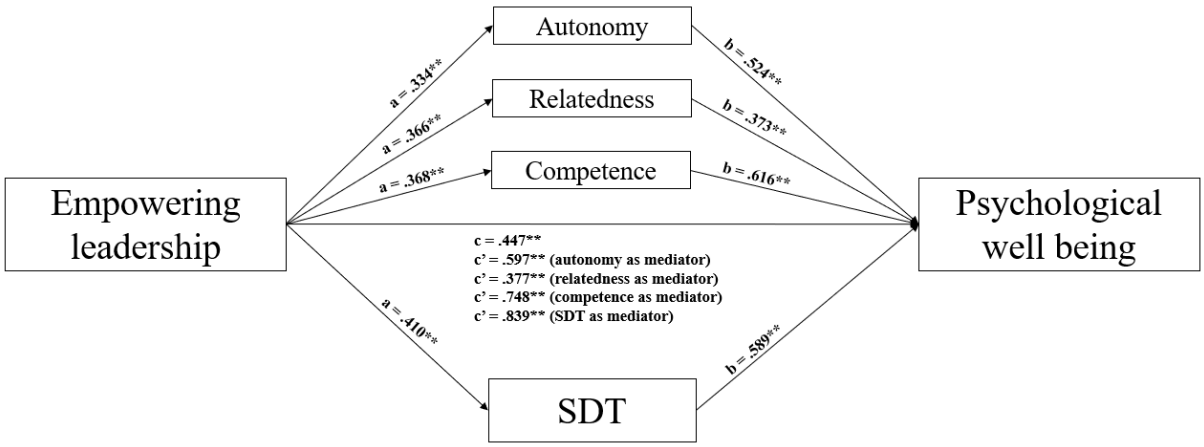

Figure 3: Additional analysis model for the mediation with significant results

Note. * = $p < .05$, ** = $p < .001$.

Discussion

The psychological well-being of employees is valuable to organizations to be successful and competitive (Hager, 2018). The shift from working at the office to working from home has its positive as well as negative effects on employees' well-being. To prevent employees' well-being from being endangered by telecommuting more research is needed on this topic. Therefore this research examined if there is a relation between telecommuting and psychological well-being. To have a better understanding of this relation, the self-determination theory (SDT) was elaborated. The indirect effects of the need for autonomy, relatedness and competence were measured in the relationship between telecommuting and psychological well-being. Furthermore, since leadership plays an important role in safeguarding employees' psychological well-being, it was chosen to analyze if empowering leadership directly influences psychological well-being. Subsequently the influence of empowering leadership in the context of telecommuting was analyzed. As a result, the following research question was examined:

To what extent does telecommuting due to COVID-19 influence psychological well-being and is this mediated by autonomy, relatedness and competence (SDT)? To what extent is the relationship between telecommuting and psychological well-being moderated by empowering leadership?

To answer this research question, a cross-sectional research among 131 employees was conducted with an average age of 29,5 years old and of which on average 45% work from home after the pandemic. In short, the results indicated that telecommuting does not directly correlate with psychological well-being. However, when the relation between telecommuting and psychological well-being is mediated by autonomy, relatedness and competence (Self-Determination Theory), the data has shown significant correlations. Next to that, the results indicate that empowering leadership positively influences the level of psychological well-being in a direct relationship. Nevertheless, when empowering leadership is interacted with telecommuting we do not see a significant relation.

Despite of what the literature indicated about the negative relation between telecommuting and psychological well-being (Hager, 2018), the results of this research found no evidence to proof this. This can be explained by the fact that many other factors will have influence on this relation. Every employee experiences telecommuting differently and has to telecommute from a different environment. The results show that the presence of a roommate while working from home is negatively associated with psychological well-being, which can be explained by the frequency of interruptions while having a roommate. Nevertheless, having a partner or child(ren) at home during telework does not significantly impact psychological well-being according to the results. An explanation for this result might be that the average age of the sample population is 29.5 years which assumes not many participants have children yet.

While researching the influences of telecommuting on psychological well-being in literature, the change in autonomy came forward regularly. The literature indicated that the fulfillment of the need for autonomy positively influences psychological well-being in the self-determination theory

(Ryan & Deci, 2001). The results of the survey have indicated that telecommuting is positively associated with autonomy, which tells that autonomy indirectly influences the relation between telecommuting and psychological well-being. This result is not surprising, taking in consideration that employees that work from home regularly, in general work more independently and have more flexibility, which results in a higher job autonomy in comparison to people that work at the office.

Another variable that came forward regularly in the literature research on the relation between telecommuting and psychological well-being was relatedness, also referred to as belongingness. The literature indicated that telecommuting leads to the inability to interact effectively with co-workers and managers (Bailey & Kurland, 2002), in extreme terms referred to as social isolation. Taking in consideration that social interactions have been found to be essential for psychological well-being (Mogilner et al., 2018) it was assumed that telecommuting would negatively influence relatedness. Despite what the literature prescribes, the data indicates the opposite. According to the results, telecommuting is positively associated with relatedness. The fulfillment of the need for relatedness positively relates to psychological well-being, which tells us that relatedness mediates the relation between telecommuting and psychological well-being. It is important to point out that the average score on relatedness in this sample group is relatively high. A possible explanation of this result could be that in this research relatedness was measured for life in general. Working from home leads to less face-to-face contact with co-workers and managers from the organization, but can possibly increase contact with close family and friends. Interesting to mention is that in a recent article written by Brunelle and Fortin (2021) this unexpected result of the positive association between telecommuting and relatedness was also found, despite what the literature prescribed. Considering that the literature and the analysis contradict each other it can be argued that there are underlying variables that have influence. Further research could benefit from analyzing this relationship in more detail.

The third and last variable that is analyzed in this research on the relation between telecommuting and psychological well-being was competence. The literature indicated that the fulfillment of the need for competence positively influences psychological well-being in the self-determination theory (Ryan & Deci, 2001). This is in line with what the results of the survey are showing. Nevertheless, the literature indicated that telecommuting would increase the produced outcomes or the fulfillment of competences (Algrari, 2017). According to what the data indicates this cannot be confirmed. An explanation for this could be that the fulfilment of people's need for competence is related to internal growth, fulfillment of meaning-making and being motivated to work on their full potential (Ryan & Deci, 2001). Although telework provides more opportunity to be productive and creative in comparison to the traditional office environment (Algrari, 2017), there is at the same time less attention for positive feedback or room for supervising. These factors are of importance for employees to feel valued and have their need for competence fulfilled (Ryan & Deci, 2001).

The literature suggested that empowering leadership and psychological well-being have a

positive relationship (Park et al., 2017) which is in line with what the results of the survey show. However it is important to point out that the level of empowered leadership in this sample group is relatively high.

At last, it was assumed that empowered leadership, when interacted with telecommuting, would impact the level of psychological well-being. The freedom and flexibility that comes with telecommuting (Jamal et al., 2021) together with the trust and encouragement that comes with an empowered leader (Ahearne et al., 2015) was expected to positively influence psychological well-being. Nevertheless, the results showed no significant effect when empowering leadership and telecommuting were interacted. In fact, the data indicated that telecommuting plays a minimal role in this relation. A possible explanation for this could be because of the relative high average scores on empowering leadership, which have a strong effect on psychological well-being in this research.

As a result, an additional analysis was performed where telecommuting was excluded from the analysis considering its low power. The data and literature already confirmed the positive relationship between empowering leadership and psychological well-being. To have a better understanding of the positive relation between empowering leadership and psychological well-being, the indirect effects of autonomy, relatedness and competence were analyzed. The analysis indicated that all three variables individually have an indirect effect. Subsequently the three variables were combined, forming the self-determination theory, and were analyzed to see if they together have an indirect effect as well. From the results can be concluded that the positive relation between empowering leadership and psychological well-being can be explained by the self-determination theory.

Although the hypothesis of telecommuting influencing psychological well-being could not be confirmed, there were many other relations visible between variables. Even though it was not the main purpose to investigate the relationship between empowering leadership and psychological well-being, the research resulted by indicating a strong direct relationship between empowering leadership and psychological well-being, and indirectly influenced by autonomy, relatedness and competence.

Limitations and directions for further research

When evaluating the findings of this study, there are some limitations to consider. The first limitation regards the research sample. This study had a small sample size of 131 respondents, when considering the complexity of the suggested conceptual model. The limited sample size leads to a lower statistical power of the analysis, which in other words is the capacity to identify effects between variables (Hair et al., 2015). Future research could test a similar conceptual model with a bigger sample size, resulting in more statistical power.

Secondly, to gather data within this research, convenience sampling and snowball sampling was used, which might lead to overrepresentation of particular groups in the population. Others groups will be underrepresented, resulting in biased outcomes (Etikan et al., 2016). Given the study's sample, it is clear that some groups are overrepresented. For example, the majority of the participants were highly educated with 94% of the respondents having finished an higher vocational education or university. This non-random sampling procedure may have influenced the findings of this study (Emerson, 2015). Future research into the relation between telecommuting, psychological well-being and empowering leadership could benefit from a random sample, as this lowers the bias that comes with using a convenience sample (Emerson, 2015). An additional limitation of the snowball sampling is that the response rate could not be calculated.

The third limitation is social desirability bias, which means that some respondents may respond to the question based on what they believe others want them to say even though anonymity was guaranteed (King & Bruner, 2000). As a result, it is probable that respondents gave socially desired answers which can affect the validity of the questionnaire (Huang et al., 1998).

The last limitation has to do with the relatively high scores that were measured in the quantitative research. Empowering leadership in particular scored on average 5.3 on a 7-point Likert scale. This is not considered problematic but this suggests that the results of the analysis are skewed and could be more representative when the data included a more equal distribution of responses. Therefore future research could benefit from a more equally distributed sample. For example by testing the model with respondents who do not in particular experience a high level of empowered leadership.

Practical implications

This study provides insights that (HR) managers and supervisors can use when their employees telecommute and a better understanding is requested on employees´ psychological well-being. Despite that telecommuting does not directly influence psychological well-being, the study has indicated that telecommuting increases autonomy which subsequently increases psychological well-being. This was indicated in the data analysis as well as recently in the literature by Galanti et al. (2021). A somewhat surprising implication that came forward in the data analysis is the positive relationship between telecommuting and the fulfillment of the need for relatedness. Unlike the assumed negative relation

that was mentioned in the literature (Kniffin et al., 2020; Bailey & Kurland, 2002), this study has indicated that this is not conclusive.

Another insight for (HR) managers and supervisors that is provided by this study is the positive relationship between the degree of empowered leadership that is experienced by the employee and the level of their psychological well-being. Both the literature and the results show the positive relationship between empowering leadership and psychological well-being.

The additional analysis in this study indicated that empowering leadership not only positively influences psychological well-being, but also the fulfillment of the needs for autonomy, relatedness and competence. These needs in turn have positive influences on psychological well-being. With this knowledge in mind, managers or supervisors that strive to increase psychological well-being are recommended to showcase characteristics of empowered leadership. Showing these characteristics, supported by the development of high quality relationships (LMX theory), will positively influence the fulfilment of the need for autonomy, relatedness and competence. This in turn will increase the psychological well-being of employees. Ultimately, increasing the psychological well-being of employees will have a positive effect on organizational outcomes (Taris & Scheurs, 2009; Rynes et al., 2002).

Conclusion

This research examined the relation between telecommuting and psychological well-being, and to what extend this relation is mediated by the fulfillment of the need for autonomy, relatedness and competence which together form the self-determination theory. The results show that telecommuting does not directly influence psychological well-being but indirectly via autonomy, relatedness and competence. Contrary to expectations, the results indicate that telecommuting positively influences the fulfillment of the need for relatedness instead of the negative relation mentioned in the literature. Furthermore the relation between the degree of empowered leadership that is experienced by the employee and the level of their psychological well-being is examined and resulted in a significant positive relation. The more empowered leadership is experienced, the higher the level of psychological well-being will be. Along with that the data analysis showed that empowering leadership positively influences the fulfillment of the need for autonomy, relatedness and competence which in turn positively influences psychological well-being.

To conclude, in the midst of a transition to work from home arrangements, it is not possible to say that telecommuting directly impacts employees' psychological well-being. Telecommuting on itself plays a minimal role according to this research. In contrary, being empowered by your manager, experiencing autonomy in your job or not-having roommates around that interrupt frequently while telecommuting will increase employees' psychological well-being.

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Appendix 1 – Questionnaire quantitative research

Introduction (in English)

Dear participant,

We are Bart Heersink and Kathy Tavares and we are currently doing our master thesis research for the master Strategic Human Resource Leadership at the Radboud University. We invite you to take part in our research by filling this questionnaire.

The questionnaire is about working from home, leadership and psychological well-being and how COVID-19 affected our career sustainability. We kindly ask you to carefully read the instruction with each set of questions and answer all questions to the best of your ability.

Filling out the questionnaire will take approximately 8-10 minutes. Your responses will be used for research purposes only. Your answers will be kept anonymous and confidential. If at any point you feel uncomfortable you have the option to leave the survey.

For further questions or assistance, please contact the research team:
Bart.heersink@ru.nl
Kathy.tavares@ru.nl

If you agree to participate with this research you can go to the next page. Thanks a lot for participating!

Control variables

What is your gender?	Man/Women/Non-binary/I prefer not to say
What is your age?	In years
What is your nationality?	Open question
What is your country of residency?	Open question
Please state your highest level of education	Elementary school/High School/ Intermediate Vocational Education/ Higher Vocational Education/ University
Years of work experience in total	In years
Years of employment at current job	In years
Do you have a (direct) manager/supervisor?	Yes/No

Telecommuting

To what extend are you working from home? (in %)	Before, during and after COVID-19
Which of the following are present in your workplace at home? (multiple answers allowed)	Desk/ Monitor Screen/ Ergonomic Chair/ Keyboard/ Daylight
Is (are) your partner/roommate/child(ren) present in the house while working from home?	5 point Likert-scale Never-Always
If present, does your partner/roommate/child(ren) cause interruptions during your work?	5 point Likert-scale Never-Always

Self-Determination theory

The questions on this page refer to the self-determination theory. This theory argues that the level of well-being of a person is dependent on the satisfaction of three basic psychological needs: autonomy, belongingness and competence. If these needs are fulfilled this will result in a better self-motivation and mental health. These questions should be interpreted for life in general.

Please choose whether you agree or disagree with the following statements:

I can find myself in the following statements:	1	2	3	4	5	6	7
	Strongly Disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
1. I feel like i am free to decide for myself how to live my life	1	2	3	4	5	6	7
2. I really like the people I interact with	1	2	3	4	5	6	7
3. Often, I do not feel very competent	1	2	3	4	5	6	7
4. I feel pressured in my life	1	2	3	4	5	6	7
5. People I know tell me I am good at what I do	1	2	3	4	5	6	7
6. I get along with people I come into contact with	1	2	3	4	5	6	7
7. I pretty much keep to myself and don't have a lot of social contacts	1	2	3	4	5	6	7
8. I generally feel free to express my ideas and opinions	1	2	3	4	5	6	7
9. I consider the people I regularly interact with to be my friends	1	2	3	4	5	6	7
10. I have been able to learn interesting new skills recently	1	2	3	4	5	6	7
11. In my daily life, I frequently have to do what I am told	1	2	3	4	5	6	7
12. People in my life care about me	1	2	3	4	5	6	7
13. Most days I feel a sense of accomplishment from what I do	1	2	3	4	5	6	7
14. People I interact with on a daily basis tend to take my feelings into consideration	1	2	3	4	5	6	7

15. In my life I do not get much of a chance to show how capable I am	1	2	3	4	5	6	7
16. There are not many people that I am close to	1	2	3	4	5	6	7
17. I feel like I can pretty much be myself in my daily situations	1	2	3	4	5	6	7
18. The people I interact with regularly do not seem to like me much	1	2	3	4	5	6	7
19. I often do not feel very capable	1	2	3	4	5	6	7
20. There is not much opportunity for me to decide for myself how to do things in my daily life	1	2	3	4	5	6	7
21. People are generally pretty friendly towards me	1	2	3	4	5	6	7

	Autonomy	**Relatedness**	**Competence**
Items	1, 4(R), 8, 11(R), 14, 17, 20(R)	2, 6, 7(R), 9, 12, 16(R), 18(R), 21	3(R), 5, 10, 13, 15(R), 19(R)

Note: the items shown with (R) have to be reversed

Psychological well-being – Geestelijk welzijn

The questions on this page refer to psychological well-being, focused on your job. Psychological well-being is characterized by high levels of positive emotions and contentment with life. High levels of psychological well-being can lead to positive outcomes in your personal life as well as for your organization.

Please choose whether you agree or disagree with the following statements:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
1. I find my work stimulating, each and every day	1	2	3	4	5	6	7
2. I do my work because I have to, and that says it all	1	2	3	4	5	6	7
3. I have seen it all as far as this job concerned	1	2	3	4	5	6	7
4. The ghought that I will have to do this job until I retire is very oppressive	1	2	3	4	5	6	7
5. I enjoy my work	1	2	3	4	5	6	7
6. I have to continually overcome my resistance in order to do my work	1	2	3	4	5	6	7

Empowering leadership – Empowering leider

The questions on this page refer to the way your (direct) manager or supervisor is managing you. In particular, it is about to what extend your manager is an empowering leader. An empowering leader motivates and encourages employees to lead themselves. Employees will experience more responsibilities and room to decide for themselves.

In case you have more than one managers or supervisors, it is best to choose the supervisor that is the most close to you in your job.

Please choose whether you agree or disagree with the following statements:

Ik kan mij vinden in de volgende stellingen:	Strongly Disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
1. My manager encourages me to find solutions to my problems without his/her direct input	1	2	3	4	5	6	7
2. My manager encourages me to search for solutions to my problems without supervision	1	2	3	4	5	6	7
3. My manager urges me to assume responsibilities on my own	1	2	3	4	5	6	7
4. My manager advises me to solve problems when they pop up without always getting a stamp of approval	1	2	3	4	5	6	7
5. My manager encourages me to view unsuccessful performance as a chance to learn	1	2	3	4	5	6	7
6. My manager encourages me to learn by extending myself	1	2	3	4	5	6	7

Appendix 2 - Demographics

Table 1: Descriptive statistics of the sample

Characteristics		**Frequencies**	**Percentage (%)**
Amount of responses		131	100,0%
Gender	Male	66	50,4%
	Female	65	49,6%
Age	Mean	29.62	
	SD	8.84	
Nationality	Dutch	103	78,6%
	Indian	20	15,3%
	Other	8	6,1%
Total Work Experience (years)	Mean	7.41	
	SD	8.76	
Current tenure (years)	Mean	3.15	
	SD	4.78	
Level of education	Elementary School	0	0,0%
	High School	3	2,3%
	Intermediate Vocational Education (MBO)	5	3,8%
	Higher Vocational Education (HBO)	50	38,2%
	University	73	55,7%

Table 2: Descriptive statistics of the sample: Working from Home

Characteristics		**Frequencies**	**Percentage (%)**
WFH before COVID	Mean	11.37	11,37%
	SD	20.98	
WFH during COVID	Mean	76.01	76,01%
	SD	28.07	
WFH after COVID	Mean	45.19	45,19%
	SD	28.60	
Workplace at home	Desk	111	84,7%
	Monitor	99	75,6%
	Ergonomic chair	53	40,5%
	Keyboard	100	76,3%
	Daylight	118	90,1%

Table 3: Descriptive statistics of the sample: Presence in the house or interruptions while working from home

Characteristics		**Frequencies**		
		Partner	Roommate(s)	Child(ren)
Presence in the house while working from home	Never	16	18	19
	Rarely	18	1	4
	Sometimes	28	16	5
	Often	22	8	8
	Always	11	9	2
	N/A	36	52	93
Interruptions while working from home	Never	18	20	18
	Rarely	31	10	6
	Sometimes	35	13	7
	Often	3	3	3
	Always	1	0	1
	N/A	43	85	96