What makes Teleworkers satisfied? The Interactive Effect of Autonomy Need Satisfaction and Self-Efficacy on Telework Satisfaction and Organizational Commitment

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Abstract

Due to the outbreak of the COVID-19 virus and consequential introduction of social distancing measurements, in many countries telework has experienced a steep increase in popularity. Despite this there are only a few studies investigating this mode of working. This research looks at the effect of autonomy need satisfaction and self-efficacy on telework satisfaction and affective organizational commitment. I hypothesized that self-efficacy will moderate the relationship between autonomy need satisfaction and telework satisfaction which further downstream also affects organizational commitment. To do so, 155 people took a survey in which they indicated how much they agree or disagree with statements regarding the four investigated variables. The results showed that autonomy need satisfaction positively relates with telework satisfaction. While I hypothesized that there will be an interaction effect of self-efficacy and autonomy need satisfaction on telework satisfaction, I found no confirmation for this relationship. However, I found significant support for the hypothesis that telework satisfaction is mediating the positive effect of autonomy need satisfaction on organizational commitment. In the discussion I give possible explanations for the insignificance of the interaction effect and give advice for further research as well as practical implications of the findings.

The Interactive Effect of Autonomy Need Satisfaction and Self-Efficacy on

Telework Satisfaction and Organizational Commitment

In the year 2020, as the world entered a pandemic, many people faced new challenges. Probably one of the biggest challenges was the drastic limitation of contact with others and consequently the restructuring of the work environment. When officials advised people to stay home as much as possible, employees needed to turn their home into an office. This made the number of teleworkers, meaning employees who work at least partially off the primary worksite and use information technology to work (Gajendran & Harrison, 2007), skyrocket. Even today, the COVID-19 virus still limits everyday life in many countries, despite the rising vaccination rates. Nevertheless, even after the COVID-19 pandemic, telecommuting might continue to be a dominant and valuable mode of working, as employers have recognized that teleworking is a workable way of doing business (Welson-Rossman, 2020). Big companies such as Apple, Ford Motor and SAP already ensured employees the possibility to telework after the pandemic where the tasks of the job allow it (Courtney, n.d.), indicating a trend of continuing teleworking even after the pandemic. Nevertheless, while for some the transition to teleworking came easily, for others it was incredibly hard. While some people appreciate the newly gained freedom by being physically distant from their boss and reduced time needed from bed to desk, others highlighted challenges such as coordinating family and work in the same four walls or dealing with the technical requirements of working from home (Kłopotek, 2017).

Increased job autonomy helps employees to adjust to the new challenges of teleworking during the COVID-19 pandemic (Carnevale & Hatak, 2020) and has also shown to increase job satisfaction. However, Stiglbauer and Kovacs (2018) stress that not job autonomy itself is important in determining job satisfaction but the fit between needed and provided autonomy. If too little autonomy is given employees feel controlled and with too

much autonomy employees might feel too much responsibility. Therefore, the sweet spot of fulfilling an employee's need for autonomy needs to be hit. Also, autonomy need satisfaction has shown to relate positive to job satisfaction, however this relationship has only been explored in the context of working from the office and not teleworking (Akkerman et al. 2018). These points give rise to the question if autonomy need satisfaction positively relates to telework satisfaction. In the course of this research paper, I will answer this question.

Furthermore, I will look at the role of self-efficacy on this relationship between autonomy need satisfaction and telework satisfaction. Self-efficacious people have shown several mechanisms, such as for example being self-disciplinary (Bouffard-Bouchard et al., 1991) and making use of their network (Black et al. 1991), which could help helped them to fully reap the benefits of autonomy need satisfaction on telework satisfaction.

Additionally, higher job satisfaction has shown to relate positively to organizational commitment (Azeem, 2010; Lumley et al., 2011). Organizational commitment describes how much an employee identifies with- and is involved in the company (Porter et al., 1974). If an employee is satisfied with their job they are less likely to quit and therefore their commitment or willingness to stay with the organization is increased (Olawale, 2017). Whether this relationship holds true in the context of teleworking is still in question.

Even though researchers have spent many years studying and providing promising knowledge on job satisfaction, it is questionable whether the results can also be applied to the context of teleworking. Working in the office and teleworking does have similarities such as that the tasks themselves are more or less the same, but other aspects differ significantly. For example, interaction with coworkers and clients while teleworking is limited to telecommunication and teleworkers can not enjoy workplace facilities like a second screen or a coffee machine. These differences between the office setting and telework setting might alter the effects known from onsite working. Nevertheless, considering the conceptual

similarities of job satisfaction and telework satisfaction, I propose that telework satisfaction has similar antecedents and outcomes as job satisfaction.

Due to only having a relatively recent rise in popularity, research on teleworking is scarce and how these differences in working from the office or teleworking play out is unclear, creating a gap in the literature on how to satisfy teleworking employees. The aim of this thesis is to fill this gap by connecting more general research on job satisfaction to the specific case of teleworking. To do so I will investigate what individual factors contribute to the satisfaction of teleworkers and its further downstream effect on organizational commitment. This will provide information on the transferability of known relationships when working at the office to the context of teleworking. To meet this aim, I will analyze the relationship between autonomy need satisfaction, self-efficacy, telework satisfaction and organizational commitment. Next to testing the theoretical transferability of relationships known from working in the office to teleworking the results also might be helpful to practitioners. I hope that this research gives employees and employers a direction on how to get the most out of teleworking by increasing teleworkers' satisfaction.

Telework Satisfaction and the Role of Autonomy Need Satisfaction

The new rise in teleworking might be a welcome change to many employers and employees. Studies have shown that businesses profit from teleworking as it increases productivity, and reduces absenteeism and tardiness, because it gives the possibility to work even when you can not leave the house due to sickness, extreme weather conditions or taking care of family (Gajendran & Harrison, 2007; Harpaz, 2002). With the popularity of teleworking, one of the largest management consultancy firms, McKinsey & Company, even predicts that "the future workforces could dedicate 28-30 percent of the time to working remotely without losing productivity" (Lund et al., 2020, p.6). However, during the pandemic this percentage has been higher for many people, often as high as 50% or more (Tavares et al.,

2020). Teleworking at least half of the working time or more is known as high-intensity teleworking. Even though this percentage is higher than the optimal percentage predicted by McKinsey, Harpaz (2002) points out that teleworkers are at least equally productive as office workers. According to Harpaz (2002), the equality in productivity of office workers and teleworkers is due to reduced frictions caused by sharing an office such that less time is used to solve interpersonal conflicts with fellow office users as well as minimizing distraction and communication time when teleworking.

Employees' productivity has been shown to be influenced by job satisfaction (Krekel, 2019) and initial productivity can quickly decrease if employees do not feel satisfied (Singh & Jain, 2013). The positive relationship between job satisfaction and productivity can be partially explained by the mediating effect of creativity. According to Amabile et al. (2005) more satisfied employees are also more creative. She defined creativity as the "production of novel, useful ideas or problem solutions" (Amabile et al., 2005, p. 2.). More satisfied employees are also more productive as they can find new ways to generate output high in quality and/or quantity while reducing the resources it costs (Krekel, 2019). Therefore, when aiming to increase productivity, employers should not neglect employees' satisfaction. Employees' satisfaction does not only positively influence productivity, but satisfied employees have shown to engage in other positive workplace behaviour such as organizational citizenship behaviour (Zeinabadi, 2010). This describes the kind of behaviour that goes beyond one's job expectations, such as for instance helping a colleague use a printer or baking a cake for a co-worker's birthday (Foote & Li-Ping Tang, 2008; Zeinabadi, 2010). Due to the influence of job satisfaction on other job outcomes, such as productivity, creativity and organizational citizenship behavior it is useful to research what makes teleworking more enjoyable, and people more satisfied with telework.

According to Self-Determination Theory (SDT) (Deci & Ryan, 1985) humans have three inherent needs, namely autonomy, competence, and relatedness (Deci & Ryan, 2000). The fulfillment of these needs at work contributes to the overall well-being (Thompson et al. 2005, Deci & Ryan, 2008). Furthermore, the fulfillment of the basic needs has also shown to increase job satisfaction (Vansteenkiste et al., 2007). In the field of SDT a lot of research is focusing on the fulfillment of the need of autonomy and is seen as more important than the other two needs, as autonomy need satisfaction is a requirement for intrinsic motivation to arise (Chiniara & Bentein, 2016). Therefore, in this research I will also focus on autonomy need satisfaction.

The need for autonomy is the need to "self-organize and regulate one's own behaviour (and avoid heteronomous control), which includes the tendency to work toward inner coherence and integration among regulatory demands and goals" (Deci & Ryan, 2000, p. 252). To satisfy employees' need for autonomy, employers can grant an employee a certain degree of freedom, such as for example choosing their own working time, place or method. Often autonomy is associated with independence, however SDT stresses the difference between these two as one can autonomously decide to be dependent or non autonomously be independent (Ryan, 1993). While it is a well known basic premise of SDT that autonomy need satisfaction influences job satisfaction, which has also been supported in multiple studies (Akkerman et al. 2018; Ilardi et al., 1993; Van der Broek et al., 2010), literature provides little explanation on why this is. However, a lot of research investigated why increased job autonomy leads to more job satisfaction. As increased job autonomy also increases the chances that employees' need for autonomy is satisfied I partially consult job autonomy literature additionally to SDT literature to explain this basic premise of autonomy need satisfaction leading to higher job satisfaction.

Two approaches can be taken to explain the beneficial effects of autonomy need satisfaction on job satisfaction: the motivational and the cognitive approach. While the motivational approach describes how autonomy need satisfaction influences the motivation to be more intrinsically and therefore positively influence job satisfaction, the cognitive approach describes how having more autonomy influences the appraisal and perception of the job itself.

The motivational approach is based on SDT, according to which acting autonomously and thereby fulfilling the need for autonomy is intrinsically motivating for the individual. Being intrinsically motivated means "doing an activity for the inherent satisfaction of the activity itself" (Ryan & Deci, 2000, p. 71). Having the need for autonomy satisfied gives the individual the freedom to choose working methods and out of the generated inherent satisfaction job satisfaction itself is increased (Ryan & Deci, 2000). In their meta-analysis Humphrey et al. (2007) also took the motivational approach and looked at autonomy as a motivational characteristic. They found that autonomy contributes to making one's work more meaningful as it first provides the freedom to choose a personally meaningful goal. Secondly, autonomy provides the optimal flexibility an individual needs to shift behavior when goal completion is endangered, which makes it possible to reach the goal or even choose a new meaningful goal. Humphrey et al. (2007) argues that, autonomous employees by being able to choose their tasks and working circumstances at least partially themselves, make work more meaningful to the individual. This positively relates to a diverse set of beneficial work outcomes, such as job satisfaction, job performance, and organizational commitment, and reduces certain disadvantageous work outcomes such as absenteeism and stress (Humphrey et al, 2007). Through this process autonomy need satisfaction might also influence telework satisfaction positively.

In her study on the influence of autonomy on various work outcomes, Saragih (2015) came to similar results. She found that autonomy was positively associated with job satisfaction. She argues that autonomy makes employees feel more responsible for the work outcome since they feel more in charge and have more control over their work. Employees give themselves more credit for the job outcomes and therefore develop more positive affective and behavioral responses to the job. This explanation is supported by the Job Characteristic Theory (Hackman & Oldham, 1976), which states that autonomy is a crucial job characteristic that eventually influences job satisfaction. The authors argue that by having more autonomy employees experience more responsibility for the outcome and therefore are more satisfied with their job.

In contrast to the previously described studies, which took the motivational approach, Morris et al. (2005) takes a cognitive approach. They investigated the role that skill utilisation together with autonomy play in increasing job satisfaction. With skill utilization they describe the possibility to learn new skills as well as make use of already mastered skills. In their research they found that workers who feel autonomous, are more likely to feel that they can make use of their full expertise and utilize their professional skills, which in turn raises positive perceptions towards the job. In addition, autonomy also allows those employees to have the freedom to make decisions that facilitate learning. Learning new skills does not only improve performance, but also leads to a more positive perception towards the job, resulting in higher job satisfaction.

To my knowledge there is no research that has studied the relationship between autonomy need satisfaction and telework satisfaction specifically. The following research aims at filling this gap and investigates whether the proposed positive relationship between autonomy need satisfaction and job satisfaction is also applicable to the context of teleworking. I hypothesize that autonomy need satisfaction is positively related to telework

satisfaction *(Hypothesis 1)*. That would mean that employees who experience that their need for autonomy is satisfied while teleworking are more satisfied with teleworking itself than employees whose need for autonomy is less satisfied.

The Moderating Role of Self-efficacy between Autonomy Need Satisfaction and Telework Satisfaction

While employees might feel autonomous in their jobs, it is also important that the job gets done. Employees face different distractions such as family life or other personal tasks when teleworking (Gajendran & Harrison, 2007). In order to get their work done they have to be internally motivated to continue to work when facing distractions at home and it is important to be persistent when teleworking. Self-efficacy might be one of the factors contributing to getting the job done. Self-efficacy is a person's belief in his or her capabilities to successfully reach a wanted outcome (Bandura, 1977). Even though Bandura (1977) describes four sources of self-efficacy suggesting that self-efficacy has some situational characteristics (Bandura, 1997), scholars consider it to be more stable across situations (Speier & Frese, 1997). Therefore, when looking at self-efficacy it makes sense to look at the general level of self-efficacy and not only at situational self-efficacy, in this case professional self-efficacy.

There are three mechanisms through which self-efficacy might contribute to employees' ability to get their work done. Firstly, self-efficacious people show more persistency (Bandura, 1977) and self-discipline (Bouffard-Bouchard et al., 1991) and previous research has stressed the importance of self-efficacy in sustaining goal pursuit. Self-efficacious beliefs motivate and aid people to sustain effort despite hardship as they are convinced that they will reach their goal and continue to work towards it (Cervone & Peake, 1986).

Secondly, when teleworking, employees might face various challenges such as feeling socially and professionally isolated (Harpaz, 2002). However, self-efficacious employees are more likely to seek professional support and keep their network alive (Black et al., 1991). Utilization and involvement in one's social network at work facilitates employees to overcome barriers and contributes to getting the job done. A study by Zeman et al. (2021) found that teleworkers generally communicate less with their co-workers and Klaffke and Reinheimer (2016) argue that communication is highly relevant for work success. Self-efficacious employees therefore are more likely to seek contact and communicate with their co-workers and by doing so successfully solve given problems and attain their goals.

Thirdly, self-efficacious employees are more likely to exhibit new behaviours, when realizing that the current behaviour does not contribute to reaching a goal and to maximize their chances of receiving feedback (Black et al, 1991; Sherf & Morrison, 2020). They use feedback to clarify expectations and to respond to these expectations effectively (Black et al., 1991). For teleworkers these might be important characteristics. For example, self-efficacious teleworkers could more easily respond to new expectations by not only clarifying them but also adjusting their behaviour to meet these clarified expectations accordingly. Therefore, I argue that through sustained effort and willingness to explore and to respond to the environments' expectations, self-efficacious employees are the ones who can fully reap the benefits of autonomy need satisfaction in telework satisfaction.

The positive relationship between autonomy need satisfaction and telework satisfaction will be enhanced by self-efficacy, as self-efficacious people are able to use their social network at work and shift behaviour when facing difficulties that come with more autonomy, formulate, and reach challenging goals and therefore are also more satisfied with teleworking. I hypothesize that self-efficacy moderates the relationship between autonomy need satisfaction and telework satisfaction *(Hypothesis 2).* That means that employees whose

autonomy needs are satisfied and are also self-efficacious will be most satisfied with teleworking.

**Telework Satisfaction and Organizational Commitment**

Next to investigating the antecedents of telework satisfaction, this study also aims at investigating the possible consequences of telework satisfaction, in order to weigh the costs and benefits of increasing job satisfaction. Research on job satisfaction has found that organizational commitment could be one of its beneficial outcomes (Azeem, 2010; Lumley et al., 2011). Organizational commitment is often seen as a multi-dimensional construct and the most dominant model to define the dimensions of organizational commitment is Allen and Meyer's (1990) three-component model (Stazyk et al., 2011). They distinguish between affective commitment (AC), which is an employee's desire to be a part of the organization, continuance commitment (CC), which is the rational calculation of cost of leaving the organization, and normative commitment (NC), which is the employees feeling of owing the company their loyalty. Previous research on organizational commitment has shown that especially AC relates to employees' work attitudes (Somers, 1995) and is one of the strongest predictors of employee-relevant outcome (Meyer et al., 1989). According to Tang and Vandenberghe (2020), this strong effect of AC is because AC reflects those shared values with the organization, which motivates the employee to work hard for the organization. This makes high AC especially beneficial for the organization itself. Furthermore, it has also shown to negatively influence employees' work attitudes that might harm the organization (Somers, 1995). For example, in his research on organizational commitment, Somers (1995) found that AC negatively relates to turnover and absenteeism. Moreover, AC also seems to positively influence beneficial organizational outcomes such as employee performance (Meyer et al., 1989) and even overall organizational performance (Woznyj et al., 2019). Employees high in AC feel like their personal values and goals and those of the organization

are matching. According to Desrosiers (2001) this feeling of matching values and goals and consequently also AC develops out of the satisfaction of the basic needs of autonomy, relatedness, and competence. This described relationship between need satisfaction and AC might be mediated by telework satisfaction. When employees are less or not at all satisfied with their job, it is likelier that they search for other opportunities that satisfy them and are less committed (Desrosiers, 2001). This is in accordance with the findings of Cornelißen (2009), who found that lower job satisfaction is indeed leading to more job search and is a predictor of actual job change and Hackney (2012) finding a negative relationship between organizational commitment and job search. According to social exchange theory (Homans, 1961) human relationships are formed and behavior is influenced by the exchange of different resources. In that way an employer provides the employee with an organizational environment that contributes to the job satisfaction, and in turn, the employee rewards the organization with their commitment to it (Angle & Perry, 1983; Eslami & Gharakhani, 2012). Previous research suggests that job satisfaction and organizational commitment are closely related concepts (Eslami & Gharakhani, 2012) and many studies have found job satisfaction to be an antecedent of AC (Eslami & Gharakhani, 2012; Feinstein & Vondrasek, 2001). However, to my knowledge there are no studies testing this relationship in the context of teleworking. Additionally, to my knowledge there is no study that investigates the relationship between the three variables of autonomy need satisfaction, job satisfaction and organizational commitment. Therefore, I hypothesize that the previously described relationship between autonomy need satisfaction and telework satisfaction is then further downstream positively related to AC *(Hypothesis 3).* This would mean that employees who experience more autonomy need satisfaction will be more satisfied with teleworking and in turn would experience increased organizational commitment.

Although more and more people started to telework in the last decade and especially in the last two year, we know relatively little about what affects employees' telework satisfaction. Identifying needs and employee characteristics that enhance telework satisfaction would enrich our understanding of how employees and organizations gain the most from telework by having more satisfied teleworkers. Finding confirmation for the proposed hypothesis would have an important and timely message for companies to raise employees' autonomy need satisfaction and self-efficacy to have more satisfied and committed teleworkers. To give an overview of the model a summary of the hypothesized relationship can be seen below in Figure 1.
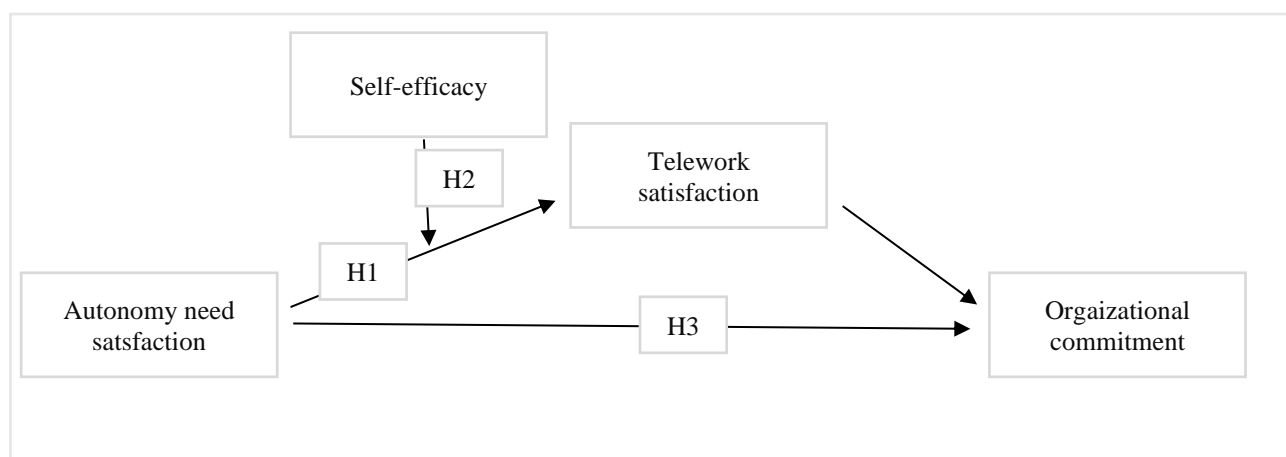
Figure 1. Overview of the model

Methods

Participants

A total of 353 people participated in the study. After clearing the data by excluding participants that did not complete the questionnaire, worked less than 3 days a week or teleworked less than 50% of their total work time, the final dataset included 156 participants. All participants were recruited from the personal network of the research team. Of the participant pool, 52.9 % are female and 46.5 % are male and 0.6% preferred not to say. The mean age is 33.3 years ($SD = 9.9$). When asking the participants for their nationality 24.5% indicated that they are Dutch, 11% German, 16.1% Canadian, 29.7% Korean and 18.7 %

indicated that they are of another nationality. For the highest completed level of education

0.6% of the sample indicated primary school, 3.9% indicated secondary school, 6.5%

indicated vocational school, 49.7% indicated that they have a Bachelor degree as highest level

of completed education, 34.8% indicated that they have a master degree, 3.9% indicated a

doctors degree and 0.6% indicated that they obtained another education as highest completed

level of education. The mean working hours per week are 38.6 ($SD = 9.6$). The average

participant spends 37.8 ($SD = 9.73$) hours per week teleworking. In the participant pool 44.5%

had prior experience with teleworking before COVID-19, while 55.5 % had no experience.

Concerning their salary 89.7% of the participants indicated that they earn average or above.

The average participant worked for 4.2 years ($SD = 6.2$) for their current employer.

Concerning the number of children under the age of 18 one has living with them 77.4% of the

participants indicated that they don't have any, 9.1% indicated that they have one child under

the age of 18 living with them, 5.6% indicated two and 1.4% have three children under the

age of 18 living with them.

Design and Procedure

The study has a cross sectional study design. We created the questionnaire in

Qualtrics, a survey software, and used the network of the research team to distribute it by

providing the link to the questionnaire to possible participants through social media or

personally approaching the participants. We informed the participants that participation is

voluntary and that their data will be handled confidentially. After filling in the informed

consent participants needed to indicate whether they work at least 50% of time from home

and worked a total of at least three days a week. In order to be able to proceed with the

questionnaire both requirements had to be fulfilled. We decided on these criteria to ensure that

participants actually do spend enough time teleworking to form a representative picture of

their experience with teleworking. Afterwards participants needed to answer some

demographic questions followed by the measurement scales. The full survey is displayed in Appendix A. The Ethical Committee of Psychology of the Rijksuniversiteit Groningen approved this study with the code PSY-2021-S-0271.

Measurements

Autonomy Need Satisfaction

We measured autonomy need satisfaction with the work-related basic need satisfaction scale by Van den Broek et al. (2010) and applied it to the context of teleworking. The questionnaire consists of a total of 7 statements on which the participants are asked to indicate on a 5-point Likert scale to what extent they agree with the statement where 1 = *totally disagree* and 5= *totally agree* when thinking about working from home. An example statement is "The tasks I have to do at work are in line with what I really want to do". The Cronbach's Alpha of the scale is α = .75.

Self-Efficacy

We measured self-efficacy with the General Self-Efficacy scale by Schwarz and Jerusalem (1995). On a 4-point Likert scale the participants need to indicate how true the statement is where 1= *not at all true* and 4 = *exactly true*. An example statement is "I am confident that I could deal efficiently with unexpected events". The Cronbach's Alpha is α= .85.

Telework Satisfaction

Telework Satisfaction is measured by the Overall Job Satisfaction Scale by Brayfield and Rothe (1951) adapted to the context of telework. The questionnaire consists of 18 statements concerning the participants' affection towards their work. The participants are asked to indicate on a 5-point Likert scale how much they agree with the statements when thinking about the statements in the context of working from home, where 1= *strongly disagree* and 5 = *strongly agree*. An example statement is: "When thinking about working

from home to what extent do you agree with the following statements? I enjoy my work more than my leisure time". I feel fairly well satisfied with my present job". The Cronbach's Alpha is α = .91

Organizational Commitment

For organizational commitment only the AC subscale is measured because out of the three subscales of organizational commitment AC seems to be the most influential concerning work attitude (Somers, 1995). The affective subscale of Allen and Meyer's (1990) organizational commitment scale is used. It consists of six statements and the participants are asked to indicate on a 4-point Likert scale the degree to which they agree, where 1= *strongly disagree* and 4 = *strongly agree*. An example statement is: "I really feel as if this organization's problems are my own". The Cronbach's Alpha is α = .81

Results

Preliminary Analysis

In the preliminary analysis I conducted the descriptive statistics and correlations between the variables. The full descriptive statistics and the correlations are in Table B1. I found a significant correlation between autonomy need satisfaction and self-efficacy ($r = .19$, $p = .01$). The correlation between autonomy need satisfaction and telework satisfaction was also significant ($r = .72$, $p < .001$) as well as the correlation between autonomy need satisfaction and organizational commitment ($r = .49$, $p < .001$). Self-efficacy also correlates significantly to telework satisfaction ($r = .025$, $p < .01$) and organizational commitment ($r = .82$, $p = .02$). Lastly, telework satisfaction and organizational commitment also correlate significantly ($r = .58$, $p < .001$).

Hypothesis Testing

To test the model, I used Hayes' (2018) PROCESS macro in SPSS to run a regression analysis (model 7). I used autonomy need satisfaction as a predictor variable, self-efficacy as

moderator, telework satisfaction as mediator and organizational commitment as the outcome variable. The complete results of the moderated mediation analysis can be found in Table B2. The analysis showed a significant positive main effect of autonomy need satisfaction on telework satisfaction ($b = 0.65$, $p < .001$). This is consistent with Hypothesis 1. The main effect of self-efficacy on telework satisfaction was insignificant ($b = 0.16$, p = 0.06). The interaction effect of autonomy need satisfaction and self-efficacy on telework satisfaction was insignificant ($b = 0.03$, $p = .83$), which contradicts Hypothesis 2. The direct effect of autonomy need satisfaction on organizational commitment was insignificant ($b = 0.20$, $p = .06$). Furthermore, the main effect of telework satisfaction on organizational commitment was positive and significant ($b = 0.63$, $p < .001$). The analysis revealed that telework satisfaction significantly mediated the relationship between autonomy need satisfaction and organizational commitment when self-efficacy was low (*effect* = 0.41, 95% *CI* [0.22, 0.61]) and high (*effect* = 0.42, 95% *CI* [0.25, 0.63]), which supports Hypothesis 3.

Discussion

This study tested the role of autonomy need satisfaction and self-efficacy on telework satisfaction and organizational commitment. I proposed that for teleworkers to fully benefit from autonomy need satisfaction, the teleworkers must believe in their own capacity. Meaning that for employees high in self -efficacy, relative to people low in self-efficacy whose need for autonomy is satisfied while teleworking, will have higher telework satisfaction. This is because self-efficacious peoples' sustained effort and willingness to explore and to respond to the environments' expectations, combined with an increased benefit from autonomy need satisfaction lead to higher telework satisfaction. Additionally, I suggested that the positive relationship of autonomy need satisfaction on telework satisfaction further downstream also positively influences higher organizational commitment.

I found support for the first hypothesis that autonomy need satisfaction is positively related to telework satisfaction, meaning that teleworkers whose need for autonomy is satisfied while teleworking will also be more satisfied with teleworking in general. These results are in line with the finding of previous research done by Vansteenkiste et al. (2007), which found evidence for a positive relationship between autonomy need satisfaction and job satisfaction. Additionally, this finding supports the argument that the relationship between autonomy need satisfaction and job satisfaction can be transferred to the context of teleworking.

The second hypothesis that the effect autonomy need satisfaction has on telework satisfaction moderated by self-efficacy was not supported. There are several possible explanations for these unexpected, insignificant results. In the following paragraphs I discuss three possible reasons: a cross cultural sample, the distinction between general and specific self-efficacy and the possible effect teleworking in a pandemic has on self-efficacy as a personal resource.

Firstly, participants in our sample had diverse cultural backgrounds, mostly coming from Germany, The Netherlands, Canada and South Korea. Nauta et al. (2010) found that self-efficacy as a moderator between job autonomy and job strains has a different effect in a US American sample than in a Chinese sample. While in the US American sample participants with high self-efficacy did not have more job strains when having low job autonomy, in the Chinese sample participants with high self-efficacy felt psychologically strained when job autonomy was low. As 29,7% of our sample is Korean and the Korean culture is closer to the Chinese culture than to US American culture, according to Hofstede's culture score (Hofstede, 2011) it might be that the effect of self-efficacy is influenced by this cross-cultural sample. However, when controlling for nationality the moderation effect of

self-efficacy on the relationship of autonomy need satisfaction and telework satisfaction remains insignificant and further research is needed.

Another reason might be that we measured general self-efficacy instead of professional self-efficacy. While general self-efficacy can be described as the belief in one's capabilities across multiple situations and contexts and seen as relatively stable (Schwarz 1999), specific self-efficacy is the belief in one's capabilities in one specific situation or activity (Grau, 2001). An example of specific self-efficacy is professional self-efficacy, which is the belief in one's competence to excel in one's professional role (Cherniss, 1993). Even though general self-efficacy and professional self-efficacy are closely related concepts they have shown to have different effects and to be significant moderators for different relationships (Grau, 2001). Therefore, it might be possible that the relationship described here is significant for professional self-efficacy, while insignificant for general self-efficacy and further research is needed on this.

An additional reason why self-efficacy was not a significant moderator of the relationship between autonomy need satisfaction and telework satisfaction might be because of the additional challenges employees have to deal with while teleworking in a pandemic. One of these challenges was the inability to separate work and personal life as many caretaking facilities and cafes were closed. That meant many teleworkers had to take care of dependents and also could not work physically away from home such as in a café. This might have influenced how self-efficacy, a personal resource, is distributed over tasks (Jerusalem & Schwarz, 1992). According to conservation of resources theory (Hobfoll, 1988), humans are motivated to secure and protect personal and social resources by carefully distributing them. When there are more challenges at once due to the fact that personal life is happening at the same time and place as working life, the personal task might direct employees' self-efficacy away from working tasks. This argument is strengthened by Social-Cognitive Theory, which

is also developed by Bandura (1986) and defines self-efficacy further. According to Social-Cognitive Theory, self-efficacy is not only the belief in one's capabilities but it also is a behavioral control mechanism by means of motivation and self-control (Ishak et al. 2016). Self-control is argued to be a limited resource (Muraven & Baumeister, 2000). Self-control being a process involved in self-efficacy could therefore also make self-efficacy a limited resource that has to be carefully divided between tasks. Therefore, this fusion of personal life and working life might alter the effect self-efficacy has in this pandemic shaped mode of teleworking and it is a question for further research to answer how this restriction to working from home interferes with the proposed relationships.

Lastly, the results showed that the third hypothesis is significant. Autonomy need satisfaction had an indirect effect on organizational commitment, which means that telework satisfaction mediated the effect autonomy need satisfaction has on organizational commitment. Satisfying employees' need for autonomy does therefore not only pay out in having more satisfied employees, but it makes them more committed to the organization. Even though the relationship between autonomy need satisfaction and organizational commitment (Gagne & Koestner, 2002) and the relationship between job satisfaction and organizational commitment (Feinstein & Vondrasek, 2001) have been studied separately, to my knowledge there is no study combining these three variables. However, this study suggests that the three variables are affecting each other and confirms previously separated studies of these variables. It also shows that not only the relationship between autonomy need satisfaction and job satisfaction can be transferred to the context of teleworking, but it can be expanded to organizational commitment as well. Furthermore, this research sends a message to employees to not be afraid to let people telework and while teleworking provide them with needed autonomy.

Interestingly, these findings on the importance of autonomy need satisfaction, telework satisfaction and organizational commitment also support person-environment fit theory. The person-environment fit describes that "the congruence, match, similarity, or correspondence between the person and the environment" (Edwards & Shipp, 2007, p. 211). The person-environment fit is based on the premise that if the person-environment fit is optimal it enhances positive outcomes for the individual and further down also for the organization. By fulfilling the employee's autonomy need the person and environment match and positive outcomes such as job satisfaction and organizational commitment are generated.

Limitations and Future Directions

Before the COVID-19 pandemic the topic of telework and how to increase teleworkers satisfaction had gotten relatively little attention in academia. With the outbreak of COVID-19 and the consequences that followed, it drastically changed. This research follows the current call to shed light in the subject of telework, in order to improve the quality of this rising mode of working.

We used a cross sectional study design to investigate how autonomy need satisfaction interplays with self-efficacy to influence telework satisfaction and further down the line organizational commitment. The results send a clear signal to organizations to provide their employees with a sufficient level of autonomy to meet their needs. This way telework satisfaction and organizational commitment can be maintained in this novel way of working. However, this study has some limitations and leaves some questions unanswered, which could guide further research on this topic.

The first and most forward limitation of this research is its study design. This study did not follow a longitudinal study design, which means that only claims of correlational nature, but no claims about causality can be made. Future studies should examine whether the

here found relationships also hold true when the independent and dependent variables are measured in a temporal sequence and whether a causal link can then be established.

Additionally, this study took place in a global pandemic, which implies that our sample is teleworking under different conditions than in times without a global pandemic. There are mainly three differences between teleworking during a pandemic and usual teleworking. First of all, in our sample the mean percentage of teleworking was high. This qualifies our sample as high intensity teleworkers, which can be defined as employees, who telework at least 3 days or more (Fonner & Roloff, 2010). Further research could investigate the question whether the variables interact the same when the percentage of teleworking is less.

Secondly, due to the enforced lockdown measurements, governments in most countries introduced rules or advised employees to work from home. It can therefore be assumed that most participants did not switch to teleworking on a voluntary basis. This is supported by the large number of participants who did not have any experience teleworking before the COVID-19 pandemic. Further research should investigate if and how relationships between autonomy need satisfaction, self-efficacy, telework satisfaction and organizational commitment change if employees freely choose to telework. As explained previously, autonomy is an important factor influencing job satisfaction (Taylor et al. 2003, Vansteenkiste et al., 2007) and in respect to teleworking this relationship between autonomy need satisfaction and telework satisfaction might even be accelerated when the employees choose whether they want to telework or not.

Third, also due to the pandemic and government measurements most restaurants, cafés, co-working spaces, holiday destinations or other places where teleworkers might like to work were closed. It can be assumed that most teleworkers could not choose their workspace freely but were restricted to working from home. Additionally, many schools and daycare

facilities closed. This means teleworkers had no way of separating their private life from their working life. According to Kłopotek (2017) the fusion of the private and working sphere is one of the big challenges of teleworking. As explained previously this special mode of teleworking might have influenced the effect of self-efficacy, because if self-efficacy is seen as a limited personal resource it has to be carefully distributed over all the challenges coming from working and personal life at the same time. The challenges and tasks from the personal life might have directed the self-efficacy away from working tasks.

To summarize, further research in the field of teleworking is needed. In specific research should analyze if there really is a causal effect of autonomy need satisfaction, telework satisfaction and organizational commitment by conducting a longitudinal study. Furthermore, future research should find out how the relationship between autonomy need satisfaction, self-efficacy, telework satisfaction and organizational commitment play out when employees telework under different conditions. Possible differences in conditions that could be investigated are the intensity of teleworking, voluntary teleworking, and the location of teleworking. Respectively the difference between having to telework while also being physically in the same place that represents the focus of your personal life. Another interesting aspect that could be investigated further is the assumption that self-efficacy is a limited resource, which gets drained if we are faced with too many challenges at once.

Implications

The study indicated that autonomy need satisfaction plays a significant role in teleworkers' satisfaction as well as their organizational commitment. Based on the results of this study, I want to stress the importance of satisfying teleworkers' need for autonomy. The first step to do so is to actually know how much autonomy the employees need and how much autonomy they are provided with at the moment. This can be done by means of questionnaires or seeking open conversations with employees. Second, the level of needed autonomy and

provided autonomy have to be matched. Gagné et al. (2017) suggest that to ensure autonomy need satisfaction employers should adjust the work design. If the provided autonomy is too low, practices such as participative decision-making can increase autonomy (Gagné et al., 2017) and thereby also autonomy need satisfaction. Also providing employees with the autonomy to choose their own working hours has shown to be beneficial (Härmä, 2006; Valcour, 2007) and is a way to increase autonomy need satisfaction. Interestingly, another less obvious aspect of work design that influences autonomy need satisfaction is tangible rewards linked to behavior, such as bonus conditional on specific behavior or reaching of goals. According to SDT literature, providing employees with extrinsic rewards linked to certain behavior will decrease autonomy need satisfaction, because it is a form of indirect control or influence of behavior (Ryan et al., 1983). Therefore, employers seeking to increase autonomy need satisfaction should avoid providing employees with tangible, extrinsic rewards such as money for certain behaviors.

Another important implication of this research is on employee monitoring. During the COVID pandemic many employers seemed to be afraid that their employees do not work when not being watched, which is indicated by a study of Reuschke and Feldstead, (2020), which showed with the increase of employees teleworking in 2019 there was also a steep increase in sales for software allowing employee surveillance. Other employers might use regular meetings and calls to monitor their employees, which could inhibit the feeling of autonomy (Pearlson & Saunders, 2001). Therefore, this research sends an important message to employers to not only give employees tasks providing them with autonomy but also to trust employees while teleworking and not closely monitor them but rather invest in making teleworkers satisfied by creating for example the right infrastructure.

Next to these measurements that an employer can take to increase autonomy need satisfaction, I also emphasize that employees proactively claim more autonomy or give up

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some autonomy in order to match their need for autonomy. Therefore, I advise employees to seek an open conversation with their employer and discuss one's need for autonomy and how to match work design to this need. This might be an especially important step for employees, who do not feel satisfied while teleworking or committed to the organization and both employees and employers will benefit from taking these steps.

Conclusion

In conclusion, this study examined the effect between autonomy need satisfaction, self-efficacy and telework satisfaction on organizational commitment. Firstly, I hypothesized that autonomy need satisfaction has a positive relationship with telework satisfaction. Secondly, I hypothesized that the relationship between autonomy need satisfaction and telework satisfaction is moderated by self-efficacy. Lastly, I hypothesized that autonomy need satisfaction has an indirect positive relationship with organizational commitment which is mediated by telework satisfaction. The analysis showed a significant positive relationship between autonomy need satisfaction and telework. Furthermore, the indirect effect of autonomy need satisfaction on organizational commitment through telework satisfaction was also significant. Lastly, the interaction effect of autonomy need satisfaction and self-efficacy on telework was not significant. This could be due to different reasons, such as the unique setting of the teleworking in a pandemic, the nationality of the sample or the fact that general self-efficacy instead of professional self-efficacy was measured. Further research is needed to investigate the process underlying working outcomes while teleworking such as telework satisfaction, as it will continue and maybe even increase to be a popular mode of working. This research stresses the importance of autonomy need satisfaction while teleworking and sends a timely message to employers that while teleworking it is important to give their employees the autonomy they need.

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Appendix A

Questionnaire also including scales that were relevant to other members of the research team

Informed Consent:

By continuing, you agree that:

- You have read and understood the information about this research.

- Your participation is voluntary and you can stop your participation at any point.

- You may refuse or skip answering any questions you wish not to answer.

- There are no right or wrong answers, and there are no advantages or disadvantages of participation.

- You can choose to provide your email address for future participation, but this information will be removed as soon as the data collection is finished, making the dataset fully anonymous and the researchers cannot identify who you are.

- All responses will be securely stored and the data will only be used for scientific and educational purposes.

- I understand that this project subscribes to the ethical conduct of research and to the protection of the dignity, rights, interests and safety of participants at all times.

Furthermore, I understand that, in case I choose to provide my email address, my personal data will be processed, and handled according to the GDPR regulations, as explained previously.

We would like you to answer some questions about your current working experiences:

- Do you work from home at least 50% of your working time?

- Do you work at least 3 days per week?

- How many hours do you work per week in total (i.e., total of telework and office work)?

- How many hours do you work from home per week?

- What percentage of your working time do you telework?

- Have you had experience with working from home before Covid-19?

- How long have you been working with your current employer (in years)?

- How would you describe your salary in comparison to the average?

- How many children under the age of 18 are still living at home with you?

We would like to ask you to fill out the demographic information below, which makes it easier for us to interpret the data later on.

- How old are you?

- What is your gender?

- What is your nationality?

- What is the highest level of education you have completed?

Task crafting

Please think of your teleworking experience and provide your answers to the questions. To what extent do you engage in the following **thoughts or behaviors regarding working from home (telework)**? Please indicate your answer on the 6-point scale below, where 1 = "Hardly ever" and 6 = "Very often".

- Introduce new approaches to improve your work

- Change the scope or types of tasks that you complete at work

- Introduce new work tasks that you think better suit your skills or interests

- Choose to take on additional tasks at work

- Give preference to work tasks that suit your skills or interests

Cognitive Crafting

To what extent do you engage in the following **thoughts or behaviors regarding working from home (telework)**? Please indicate your answer on the 6-point scale below, where 1 = "Hardly ever" and 6 = "Very often".

- Think about how your job gives your life purpose

- Remind yourself about the significance your work has for the success of the organization

- Remind yourself of the importance of your work for the broader community

- Think about the ways in which your work positively impacts your life

- Reflect on the role your job has for your overall well-being

Relational Crafting

To what extent do you engage in the following **thoughts or behaviors regarding working from home (telework)**? Please indicate your answer on the 6-point scale below, where scale 1 = "Hardly ever" and 6 = "Very often".

- Make an effort to get to know people well at work

- Organize or attend work-related social functions

- Organize special events in the workplace (e.g., celebrating a coworker's birthday)

- Choose to mentor a new employee (officially or unofficially)

- Make friends with people at work who have similar skills or interests

Autonomy Need Fulfillment

To what extent do you agree with the following statements regarding **working from home (telework)**? Please indicate your answer on the 5-point scale below, where 1 = "Strongly Disagree" and 5 = "Strongly Agree".

- I feel free to express my ideas and opinions in this job

- I feel like I can be myself at my job

- At work, I often feel like I have to follow other people's commands

- If I could choose, I would do things at work differently

- The tasks I have to do at work are in line with what I really want to do

- I feel free to do my job the way I think it could best be done

- In my job, I feel forced to do things I do not want to do

Competence Need Fulfillment

To what extent do you agree with the following statements regarding **working from home (telework)**? Please indicate your answer on the 5-point below, where 1 = "Strongly Disagree" and 5 = "Strongly Agree".

- I don't really feel competent in my job

- I really master my tasks at my job

- I feel competent at my job

- I doubt whether I am able to execute my job properly

- I am good at the things I do in my job

- I have the feeling that I can even accomplish the most difficult tasks at work

Relatedness Need Fulfillment

To what extent do you agree with the following statements regarding **working from home (telework)**? Please indicate your answer on the 5-point scale below, where 1 = "Strongly Disagree" and 5 = "Strongly Agree".

- I don't really feel connected with other people at my job

- At work, I feel part of the group

- I don't really mix with other people at my job

- At work, I can talk with people about things that really matter to me

- I often feel alone when I am with my colleagues

- At work, people involve me in social activities

- At work, there are people who really understand me

- Some people I work with are close friends of mine

- At work, no one cares about me

- There is nobody I can share my thoughts with if I would want to do so

Perceived Organizational Support

To what extent do you agree or disagree with the following statements regarding the organization you work for? Please indicate your answer on the 5-point scale below, where 1 = "Strongly disagree" and 5 = "Strongly agree".

- My organization cares about my opinion

- Help is available from the organization when I have a problem

- My organization really cares about my well-being

- My organization is willing to extend itself in order to help me perform my job to the best of my ability

- Even if I did the best job possible, my organization would fail to notice

- My organization cares about my general satisfaction at work

- My organization takes pride in my accomplishments at work

- My organization strongly considers my goals and values

- My organization shows very little concern for me

Self-efficacy

To what extent are the following statements true for you? Please indicate your answer on the 4-point scale below, where 1 = "Not at all true" and 4 = "Exactly true".

- I can always manage to solve difficult problems if I try hard enough

- If someone opposes me, I can find the means and ways to get what I want

- It is easy for me to stick to my aims and accomplish my goals

- I am confident that I could deal efficiently with unexpected events

- Thanks to my resourcefulness, I know how to handle unforeseen situations

- I can solve most problems if I invest the necessary effort

- I can remain calm when facing difficulties because I can rely on my coping abilities

- When I am confronted with a problem, I can usually find several solutions

- If I am in trouble, I can usually think of a solution

- I can usually handle whatever comes my way

To what extent do you agree with the following statements? Please indicate your answer on the 5-point scale below, where 1 = "Strongly disagree" and 5 = "Strongly agree".

- I would be very happy to spend the rest of my career in this organization

- I really feel as if this organization's problems are my own

- I do not feel like "part of my family" at this organization

- I do not feel "emotionally attached" to this organization

- This organization has a great deal of personal meaning for me

- I do not feel a strong sense of belonging to this organization

Affective Organizational Commitment

When thinking about working from home, to what extent do you agree with the following statements? Please indicate your answer on the 5-point scale below, where 1 = "Strongly disagree" and 5 = "Strongly agree".

- My job seems like a hobby to me

- My job is usually interesting enough to keep me from getting bored

- It seems that my friends are more interested in their jobs

- I consider my job rather unpleasant

- I enjoy my work more than my leisure time

- I am often bored with my job

- I feel fairly well satisfied with my present job

- Most of the time I have to force myself to go to work

- I am satisfied with my job for the time being

- I feel that my job is no more interesting than others I could get

- I definitely dislike my work

- I feel that I am happier in my work than most other people

- Most days I am enthusiastic about my work

- Each day of work seems like it will never end

- I like my job better than the average worker does

- My job is pretty uninteresting

- I find real enjoyment in my work

- I am disappointed that I ever took this job

Appendix B

Statistics

Table B1

Descriptive and Pearson's Correlations

Variable	Mean	SD	Autonomy Need Satisfaction	Self-Efficacy	Telework Satisfaction
Autonomy Need Satisfaction	3.52	0.67	-		
Self-Efficacy	3.21	0.42	0.196*	-	
Telework Satisfaction	3.57	0.63	0.718**	0.247**	-
Organizational Commitment	3,20	0,84	0.493**	0.817*	0.581*

*p < .05; ** < .01

Table B2

Model Estimation Results for Assessing Moderated Mediation Wherein Autonomy Need
Satisfaction and Self-Efficacy Interact to Influence Organizational Commitment
Through Telework Satisfaction

	Mediator variable model (DV = Telework Satisfaction)				
Predictor	*B*	*SE*	*t(155)*	*LLCI*	*ULCI*
Constant	3.57	0.03	100.00**	3.50	3.64
Autonomy Need Satisfaction	0.65	0.05	11.93**	0.55	0.76
Self-efficacy	0.16	0.09	1.92	- 0.01	0.33
Autonomy Need Satisfaction × Self-efficacy	0.03	0.14	0.22	- 0.24	0.30
	Dependent variable model (DV = Organizational Commitment)				
Predictor	*B*	*SE*	*t(155)*	*LLCI*	*ULCI*
Constant	0.94	0.46	2.05*	0.03	1.84
Autonomy Need Satisfaction	0.20	0.20	1.66	-0.04	0.43
Telework Satisfaction	0.63	0.13	4.99**	0.38	0.88
	Conditional indirect effects of the predictor at values of the moderator				
	Effect	*Boot SE*		*LLCI*	*ULCI*
Organizational Commitment	0.41	0.10		0.22	0.61
if self-efficacy is low	0.42	0.10		0.25	0.63
Organizational Commitment					
if self-efficacy is high					

*p < .05; ** < .01