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Covid-19: The Future of Home Office

A quantitative study of employees in a large engineering company's experiences and future orientations related to working from home, during the Covid-19 pandemic.

Master's thesis in Counselling
Supervisor: Jonathan Reams
Co-supervisor: Vegard Johansen
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Faculty of Social and Educational Sciences
Department of Education and Lifelong Learning

Abstract

The purpose of this master's thesis was to look at the experiences and future orientations employees in a large engineering company have formed, after working from home during the Covid-19 pandemic in Norway. The psychosocial factors highlighted in this thesis are autonomy, relatedness and competence, based on the Self-Determination Theory, and where these were compared with the employees' experience of work-family balance during the pandemic. The thesis also looked more closely at what wishes the employees have for their future workweek, after the pandemic. Based on this, the main research question was: *What connections are there between work-family balance, autonomy, relatedness, competence and future orientation, while teleworking in a large engineering company during the Covid-19 pandemic?*

This thesis followed a quantitative research methodology, where the data material was collected via a digital survey, in collaboration with an external company. Furthermore, the survey was based on a cross-sectional design and was deployed in the end of March 2022. The thesis used a convenience sample consisting of 265 employees, with a response rate of 43%. In the analysis process, various bivariate analyses were used, where factor analysis was used to quality ensure the scales. Correlation analysis was used to see possible correlations between dependent and independent variables. To calculate the different relationships, significance testing and calculation of effect sizes were used. Furthermore, a multiple hierarchical linear regression analysis was used to examine the relationship between work-family balance and selected independent variables. Finally, chi-square tests were used to see group differences between different independent variables.

The thesis findings indicate that perceived autonomy has a positive correlation with perceived work-family balance while teleworking, during the pandemic. Furthermore, the findings indicate that 69% of the sample want a hybrid work structure after the end of the pandemic. The thesis findings also showed that there were differences between gender, age and households with/without children, in how they responded to their subjective ability to separate work and family in a good way, and ability to return to the workplace with minimal disruption to routines/personal life. Although the results in the analyses are significant, the thesis results are characterized by a small sample size, as well as small effect sizes and predictive total variance. Therefore, it's necessary to take this into account when interpreting the results.

Further, acquiring knowledge in this research area can be of great importance in ensuring a meaningful workday in an increasingly digitalised and unpredictable world.

Abstrakt

Hensikten med denne masteroppgaven var å se på erfaringene og framtidsorienteringene ansatte i et stort ingeniørfirma har dannet seg, etter å ha jobbet hjemmefra under Covid-19 pandemien i Norge. De psykososiale faktorene som trekkes frem i denne oppgaven er autonomi, tilhørighet og kompetanse, basert på Selvbestemmelsesteorien, og hvor disse ble sammenlignet med de ansattes opplevelse av arbeid-familie balanse under pandemien. Oppgaven så også nærmere på hvilke ønsker de ansatte har for sin fremtidige arbeidshverdag, etter pandemien. Basert på dette var hovedproblemstillingen: *Hvilke sammenhenger er det mellom arbeid-familie balanse, autonomi, tilhørighet, kompetanse og framtidsorientering, mens man jobbet på hjemmekontor i et stort ingeniørfirma under Covid-19-pandemien?*

Denne oppgaven fulgte en kvantitativ forskningsmetode, hvor datamaterialet ble samlet inn via et digitalt spørreskjema, i samarbeid med en ekstern bedrift. Videre var undersøkelsen basert på et tverrsnittsdesign og ble utsendt i slutten av mars 2022. Oppgaven brukte et bekvemmelighetsutvalg bestående av 265 ansatte, med en svarprosent på 43%. I analyseprosessen ble det benyttet ulike bivariante analyser, hvor faktoranalyse ble brukt for å kvalitetssikre skalaene. Korrelasjonsanalyse ble brukt for å se mulige sammenhenger mellom avhengige og uavhengige variabler. For å beregne de ulike sammenhengene ble det brukt signifikanstesting og beregning av effektstørrelser. Videre ble en multippel hierarkisk lineær regresjonsanalyse brukt for å undersøke forholdet mellom arbeid-familie balanse og utvalgte uavhengige variabler. Til slutt ble kji-kvadrat-tester brukt for å se på gruppeforskjeller mellom ulike uavhengige variabler.

Oppgavens funn indikerer at opplevd autonomi har en positiv korrelasjon med opplevd arbeid-familie balanse, ved å jobbe på hjemmekontor under pandemien. Videre tyder funnene på at 69% av utvalget ønsker en hybrid arbeidsstruktur etter pandemiens slutt. Funnene viste også at det var forskjeller mellom kjønn, alder og husholdninger med/uten barn, på svarfordelingen på deres subjektive evne til å skille arbeid og familie på en god måte, og evne til å komme tilbake til arbeidsplassen med minimale forstyrrelser i rutiner/privatlivet. Selv om resultatene i analysene er signifikante, er oppgaven preget av en liten utvalgsstørrelse, samt små effektstørrelser og prediktiv total varians. Derfor er det nødvendig å ta hensyn til dette i tolkning av resultatene.

Videre, vil å innhente kunnskap om dette forskningsområdet kan ha stor betydning for å sikre en meningsfull arbeidshverdag i en stadig mer digitalisert og uforutsigbar verden.

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This master's thesis is written as a final mark of the master's degree program in counselling at the Norwegian University of Science and Technology (NTNU), at the Faculty of Social and Educational Sciences in the Department of Education and Lifelong Learning (IPL).

This thesis also marks the end of five memorable years at NTNU, where this feels both melancholy and liberating at the same time. The writing process of this thesis has offered ups and downs, where I am now left with a product that I am very proud of. Although the thesis is a result of independent work, there are several people who deserves a special thanks and attention.

I would like to begin by thanking my two incredible supervisors Jonathan Reams and Vegard Johansen, for their professional inputs, constructive feedback and overall engagement. Their support has been invaluable, as they have made this writing process inspiring, as well more manageable. Furthermore, I would like to thank all the lecturers at the master's program in counselling science, for two rewarding years, where I have been challenged and felt mastery. Furthermore, I would like to give a big thanks to my friends and family, for the support and engagement throughout this process. Last but not least, I would also like to thank my wonderful boyfriend who always supports and cheers on me.

The process of writing this master's thesis has had a steep learning curve and provided deeper insight into a topic that I myself am passionate about. Further, I hope that this thesis is perceived as rewarding, for the reader as well. With that, happy reading!

NTNU, Trondheim, May 2022

Nora Amanda Solstad

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1 Introduction

1.1 Actualization and societal trends in the larger public discourse

Covid-19 has been the largest pandemic since the Spanish flu and has claimed millions of lives worldwide. Norway was hit by the Covid-19 pandemic in March 2020 and was reopened again in September 2021. From September 2021 to February 2022, the Norwegian government has gone back and forth on reimplementing and removing the strict restrictions that were introduced at the pandemic's start. In total, for two years strict restrictions have taken hold in several parts of society, and where we first now can look back on what effect this has had on not only Norway, but the whole world. In a Norwegian study, Bakkeli (2021) claimed that we know relatively little about how pandemics affect the relationship between life, work and life satisfaction. Therefore, studies that investigate this relationship will help to increase crucial knowledge to this research area.

Companies around the world in today's modern society have shared the challenge of being able to quickly adapt to different challenges in a high-speed society. Today's challenges are diverse, and involve several complex issues, e.g., climate changes, economic downturns, political instability, war and not least pandemics (Carnevale & Hatak, 2020). In our globalized world, these challenges pose an immediate threat to corporate survival in the labour market, where the recent Covid-19 pandemic is a good example of such a challenge. The outbreak of the pandemic forced companies around the world to relocate large parts of their organizational structure, both in terms of technical, physical and psychosocial conditions, in a way that has not been done before. This pandemic accelerated already existing trends with increased digitalization and job flexibility, which contributed to e.g., increased job insecurity, demands for self-discipline, autonomy and fluid boundaries between different life domains (Syrek et al., 2021).

The Covid-19 pandemic is not the first pandemic to have shaken the world, and like other outbreaks such as SARS, influenza and Ebola, it has been reported that the general population suffered from severe mental health problems during both previous and recent outbreaks (Armour et al., 2020; Kumar et al., 2021). Patterson et al. (2021) argue that the difference between the Covid-19 pandemic and previous pandemics does not necessarily come from the pathogen, but rather from the indirect effects of the control measures that affected the population, which concern health and general core activities in society. The control measures/restrictions that came into force in many countries, including Norway, had a dramatic impact on the general population, and their e.g., perceived quality of life, mental health and personal finances. One of the restrictions that was implemented was to increase the use of telework. Telework has long been a research topic that has shown conflicting results. Some studies link telework to positive effects such as, increased autonomy, flexibility and productivity (Novaes et al., 2018; Brunelle & Fortin, 2021), while other studies link it to negative effects such as increased stress, social isolation and work-family conflict (Carnevale & Hatak, 2020; Meyer et al., 2021; Kühnel et al., 2016).

Researchers have for a long time tried to figure out whether teleworking is ultimately a "good" or "bad" thing, but now in the 21st century there are not yet any clear answers. This paradox has been noted as a mutually incompatible consequence for the working population (Brunelle & Fortin, 2021). Because of this, recent research has focused on how teleworking has affected the population during the Covid-19 pandemic (Wang et al., 2020; Usman, et al., 2021). This because pandemics create a demand for development and innovation, and such challenges will also occur in the future. Because of this, we do not know for sure what a normal working day will look like in the future. Another argument that is constantly emerging is the need for updated research about this phenomenon, as

well as more international research (Seaton et al., 2021; Wang et.al., 2020). By generating new research into this research area, one can help give the working population an opportunity to share their subjective experiences, as well as help companies gain a competitive advantage by creating and offering a beneficial telework agreement for their employees.

Based on this, teleworking has played a central role in lockdown in many countries, and where the big question lies is in how to optimize teleworking in the best possible way, to deal with future challenges.

1.2 The project purpose and important considerations

The purpose of this project is to gain a deeper understanding of how Norwegian employees have experienced teleworking during the pandemic, as well as to explore what wishes they have for their future workday after the pandemic. This thesis is written within the counselling field, with the goal that the results will be useful for counsellors in several industries and disciplines. The thesis is particularly relevant for counsellors in HR, management and organizational development, which will apply to both the private and public sector.

This topic can be understood as relevant to the field of counselling in several ways. As a counsellor, you must be ready to meet clients with different challenges, also related to their working lives. As a counsellor, it's important to give the client space to share their subjective perceptions of a given situation, which has affected them (Kvalsund & Meyer, 2014). For example, to be able to help clients when their workplace is undergoing major changes e.g., during a pandemic, may help increase their motivation to accept these changes. An HR/organization-counsellor have close contact with both managers and employees, where the counsellor can be seen as a link between them (Kvalsund & Meyer, 2014). This entails a responsibility to truthfully communicate the wishes and challenges of both parties, and create openness and understanding as a whole.

This thesis can be seen as a contributor to increase understanding of the phenomenon of work-family balance under challenging conditions, where this thesis promotes a preventive perspective. It is desirable that the findings and reflections in this thesis can contribute to an increased understanding of employees' possible challenges and wishes related to being a digital employee during the pandemic. Important considerations regarding this thesis, is that the thesis presents a selection of relevant research and theoretical perspectives. This to delimit the scope of the thesis, as well as to shed light on a specific area within the field of counselling. The connection between work-family balance, autonomy, relatedness and competence, during the pandemic, will be the main themes. Different concepts used in the thesis will be defined when further introduced in the theory chapter.

1.3 Personal inspiration and the research question

The theme for this master's thesis was mainly selected due to self-interest in the work environment field and work-family dynamics. This interest has been with me throughout my years as a student, where I have also through my own work life experienced the challenges associated with balancing work and family/leisure. As a future counsellor, I want to shed light on the extent of this phenomenon in the Norwegian population, especially in an unpredictable modern working society. During the pandemic, I was an employee myself,

and have used teleworking as a large part of my everyday work life, even to this day. This topic is not only close to my own experiences, but also several thousands of other Norwegian employees (Statistisk sentralbyrå [SSB], 2021). With my curiosity and engagement for this topic, the thesis research question is as followed:

What connections are there between work-family balance, autonomy, relatedness, competence and future orientation, while teleworking in a large engineering company during the Covid-19 pandemic?

To investigate different contexts related to the problem, these two more specific research questions have been made:

1. *To what degree did teleworking during the Covid-19 pandemic affect employees in a large engineering company's, experience of work-family balance, autonomy, relatedness and competence?*
2. *Has teleworking during the Covid-19 pandemic affected what employees of a large engineering company think is best for themselves and their colleagues after the pandemic?*

1.4 The thesis outline

This thesis is divided into 6 main chapters, which contain the following topics: (1) introduction, (2) theory, (3) methodology, (4) results, (5) discussion and (6) conclusions. Chapter 1 has introduced the thesis actualization and social trends, purpose, personal inspiration and the chosen research questions. Chapter 2 will address the thesis theoretical framework and summarize the hypotheses related to the research question. Chapter 3 presents the thesis methodology and highlights the various methodological choices that has made in the research process. Here, the thesis chosen design, statistical analyses, quality assurance and ethical reflections will be emphasized. In Chapter 4, there will be an overview of the thesis results of various statistical analyses carried out. In Chapter 5, the thesis research questions will be discussed in the light of selected theory and earlier research presented in Chapter 2. Finally, Chapter 6 will present the thesis main findings, the limitations and reflections for future research.

2 Theory

In this chapter, I will start by presenting an overview of work life before the pandemic. Then the chapter will present a literature review based on previously done research about employee's work-family balance while teleworking, during the pandemic. The second part of this chapter will present the theoretical framework for this thesis, which is the Self-determination theory by Deci & Ryan. At the end of this chapter, there will be a summary of the thesis hypotheses, related to the research question, and a brief review of societal thoughts related to the future work life after the pandemic.

2.1 Work life before the pandemic

To know whether working life has changed during the Covid-19 pandemic, it will be necessary to establish an understanding of what life was like before the pandemic. The pandemic outbreak can be traced back to the turn of the year 2019/2020, when the virus spread at an enormous rate in the following months. In March 2020, the World Health Organization (WHO) declared the outbreak as a pandemic, and several countries soon after decided to implement infection prevention restrictions. In Norway, 12th March 2020 is considered the day when "Norway shut down", where Prime Minister Erna Solberg on the same day introduced "*the strongest and most intrusive measures we have had in Norway in peacetime*" (NOU 2021: 6, p. 15-20). Some of the implemented restrictions was e.g., closure of kindergartens, schools and educational institutions, statutory quarantine and recommendations to increase the use of telework where it's possible.

These changes led to most of the population having to interact digitally with their various life domains, but digital communication and teleworking is not something new and foreign. Teleworking can be traced back to the early 80's, where technological advances, increased globalization and digitalization made it possible for some employees to work from places other than their physical workplace. Since the 80's, the growth of home offices has slowly become more and more widespread in several countries, where 17% of European employees in 2015 worked with some form of telework (Lunde et al., 2022). When the pandemic occurred, the number of full time teleworking European employees increased to 37%, and up to 50-60% in the Nordic countries (Milasi et al., 2021). Specifically for the Norwegian population, one can also see an increase in teleworking, from the time before the pandemic and until today. In a report conducted by Ingelsrud & Bernstrøm (2021) they found that the proportion of employees with the opportunity to telework has increased from 35% in 2017 to 51% in 2019. Right after Norway's lockdown in March 2020, 50% of employees had the opportunity to telework, while in February 2021, 52% still said the same.

Due to the steady increase of teleworking before the pandemic, researchers have also been focusing on employee's ability to balance work and family (Innstrand, 2010). Before the pandemic, teleworking was seen as voluntarily and not mandatory, where work-family balance was a highly focused area within the Norwegian family policy. This policy deals precisely with the right to be able to work, and not have to choose between family and work. Work and family are two of the most important domains for most adults in modern Norway, and where today's family constellations have changed significantly in the recent years. This change could first be seen in the 70's, where there was less focus on becoming "the typical nuclear family", where fewer people got married and more people got divorced (Innstrand, 2010).

Today, there are more double-working couples and more single parents, in addition to increased working hours and education length. This change created concerns about how to facilitate employees' work-family balance in a healthy way. This focus in turn created a robust family policy, which emphasizes a more equal division of labour between the mother and father, and at the same time could give children the best growth conditions (NOU 2017: 6, p. 141-147). This policy includes benefits such as day-care facilities at work, an extra paid holiday week, flexible working hours, the right to be home if your child is sick and the possibility of job sharing (Saksvik & Christensen, 2015). This policy also promote that no employee should be discriminated against because they have or/are expecting children, neither in employment, wage developments nor in hindering career opportunities (NOU 2017: 6, p. 141-147). Until the outbreak of the pandemic, teleworking had largely been an advantage for highly skilled employees in knowledge-intensive industries, who do most of their work digitally (Milasi et al., 2021). Therefore, for some occupations it can be difficult if not impossible to perform work tasks away from their physical workplace, e.g., in vocational professions (Milasi et al., 2021).

2.2 Literature review

This literature review will contain an in-depth explanation of the concept work-family balance during the pandemic, as well look at related concepts such as work-family conflict, and individual differences regarding teleworking.

In this analysis, work-family balance will be conceptualized by the experience of teleworking. It will be important to mention that the term "teleworking" can be referred to in several ways, such as "home-working", "telecommuting" and "remote work" (Wang et al., 2020). In this thesis I have chosen to mainly use the term "teleworking", as a common term. In turn, the term is defined by Norwegian law as: work performed in the employee's home, and is often used in combination with work at the permanent workplace (Regulations on work performed in the employee's home, 2002, § 1-3).

2.2.1 Work-family balance: conceptualization

In the existing literature, the concept *work-family balance* (WFB) is used in various approaches, but has gained great influence in the organizational research field. The term WFB has been conceptualized in many ways, such as "work-life balance", "work-leisure balance", and "work-home balance". As a summary for all the different terms, the concept deals with the individual's relationship between one's own private life and working life (Mansour & Tremblay, 2018). In this thesis, the preferred term is WFB and will be used from now on. WFB specifically, can be defined as a positive perception of the different life domains, family and work, and the desire to minimize the conflicts between the different roles in each domain (Kumar et al., 2021). The balance between work and family life is formed by the individual's perception of the compatibility between the individual's various activities, support for self-development, achieving one's life priorities, and minimizing conflicts between the domains. A high degree of perceived WFB, also called *work-family facilitation* (WFF), refers to harmony between these two domains, where both domains complement each other (Akkaya et al., 2021; Wang et al., 2020). As one of the main topics in this thesis, it's desired to analyse one's perception of WFB while teleworking during the Covid-19 pandemic.

The outcomes of an unhealthy WFB, are often divided into work-related and non-work-related outcomes, based on the two life domains. Previous research shows that non-work-related outcomes are related to an increased degree of job performance, job satisfaction and organizational commitment, as well as lower absenteeism and turnover intentions (Akkaya et al., 2021). In the second category, non-work-related outcomes, are related to an increased degree of life- and family satisfaction, and less family conflicts. Both work-related and non-work-related outcomes indicate that the experience of a satisfactory degree of WFB are important for a fulfilling working life (Akkaya et al., 2021, Wang et al., 2020).

During the pandemic, large parts of the working population were affected by strict restrictions, which presented new challenges in various life domains. One of the main restrictions that came into force during the pandemic, was increased teleworking. This led to employees having to switch to working digitally in home offices, surrounded by new potential disturbances. Other restrictions required children and adolescents to attend digital home-schooling, as well as reduction in leisure activities and general social interaction, where this habituation has not been easy for everyone (Wang et al., 2020). This led to employees having to relate to the family and work domain at the same time, which also may have led to blurred boundaries (Carnevale & Hatak, 2020). A study done by Wang et al. (2020) found that employees who teleworked during the pandemic struggled to balance work and family. This because interruptions from family affected the efficiency at work, and vice versa. Even before the pandemic, there has been increased attention to employees' WFB, where more workplaces have become more family-friendly, by e.g., offering flexible work arrangements and childcare services. This has been shown to reduce *work-family conflict* (WFC). But when the pandemic came, the work-family domain was hit by bigger and more complex challenges, which also led to increased WFC (Carnevale & Hatak, 2020).

2.2.2 When work and family collide

To nuance the picture of WFB, an overview of the consequences of an unsatisfactory degree of WFB is required. An unsatisfactory degree or lack of WFB is in organizational research, referred to as the concept of WFC. WFC can be defined as a form of inter-role conflict from the work-family domains, which together can create a state of insecurity in connection with conflicting expectations (Carnevale & Hatak, 2020; Kaufmann & Kaufmann, 2015). WFC can be divided into two approaches which are work-family conflict and family-work conflict, but where this thesis looks at both approaches under the same concept, WFC.

WFB does not represent a static relationship between WFF and WFC. This is because there will be a spectrum between these approaches, where they mutually influence each other. Further, the spectrum could be understood as a scale from experiencing 100% WFF to 100% WFC. Where each individual identifies themselves on this spectrum, will be based on their subjective perceptions of WFB. Like the spectrum between WFF and WFC, a study by Shirmohammadi, Au & Beigi (2021) also found that one can interpret the characteristics of telework as a spectrum. This where the extremes of the spectrum represent the best advantages and the worst disadvantages of teleworking.

Literature and previous research often point out that work and family roles are mutually enriching, but can also lead to problems and conflicts if not balanced (Kumar et al., 2021). This because work affects family life, and family life affects work. Kumar et al. (2021)

refers to “the role theory”, which claims that humans find it difficult to maintain multiple roles, and can never fulfil all roles equally. Which leads to inter-role conflict, where the individual experience a feeling of not fulfilling any of the desired roles. This happens when an individual has several roles that might be too difficult to combine, or have roles that cannot be combined at all (Levinson et al., 1965). An example of an inter-role conflict during the pandemic, is the desire to be an effective employee, but also a caring parent. Through the law, Norwegian employees have a robust family policy, which comes with several benefits (Saksvik & Christensen, 2015). During the pandemic, employees experienced loss of some of these benefits, such as day-care facilities at work. Other changes can be seen in connection with flexible working hours, where the employee no longer has a physical workplace to attend, where they now were depending on self-discipline to structure their own working hours. If lack of self-discipline was prominent, it could lead to unstructured working days, and cause deprioritization or procrastination (Wang et al., 2020, Kühnel et al., 2016).

When stable benefits suddenly change, an adjustment is required. For many employees, unforeseen changes that affect their work and family, can lead to stress and insecurity. This insecurity may also increase the degree of WFC, where individual differences also affect the experience degree of WFC (Saksvik & Christensen, 2015).

2.2.3 Gender differences and households with children

Within the organizational field there were a focus on gender differences and differences due to family reasons, long before the pandemic’s outbreak. Previous studies have shown that women contribute more to housework, and suffer more often than men from the negative psychological effects of the pandemic. Women report more dissatisfaction with WFB than men, although there are small differences. There are several consequences of the pandemic that have affected parents and especially parents of young children, this e.g., being at work while at the same time caring for their children, that could lead to increased role conflict and exhaustion over time (Carnevale & Hatak, 2020; Meyer et al., 2021).

Households with children faced a major challenge in balancing work and family roles during the pandemic, where stress and burnout over a long period of time were current negative outcomes (Wang et al., 2020). There were also noticeable differences between families living with and without children, in their perceived degree of job satisfaction. During the pandemic, employees with children experience new work disruptions, such as being forced to help the children with home-schooling, alongside being at work (Armour et al., 2020; Kumar et al., 2021; Collins et al., 2013). But in contrast, there have also been studies who have shown that employees with children also saw the benefits of being able to telework (Armour et al., 2020). This related to more flexibility, in case of unforeseen illness or being able to deliver/pick-up children from kindergarten/school. While teleworking during the pandemic employees with children, regardless of gender, appreciated to manage their own working hours more freely. Teleworking is also reported in other studies to help improve employees WFB, but teleworking also challenges the traditional gender roles (Kumar et al., 2021; Collins et al., 2013).

Within the EU teleworking women, especially women with children under the age of twelve, reported lower levels of concentration, difficulty meeting expectations from employers, and difficulty coping with housework and family responsibilities (Tomei, 2021). A study done in

the UK also found that during the pandemic, mothers reported being disturbed by their children 50% more often than fathers (Tomei, 2021). But surprisingly, studies conducted in the US, UK, Vietnam and the EU, have shown that more women than men confirm that they still want to have the opportunity to telework after the pandemic (Tomei, 2021). Teleworking allows women to earn a living, while being able to take care of their family and maintaining a healthy WFB at the same time. Similarly, men also want to have access to teleworking after the pandemic. The increased willingness of men to telework during the pandemic has shown an encouraging effect on reversing the traditional gender roles. Where the pandemic can in one way or another, open for more experience related to the joy of working at home, in relation to sharing more time with family, as well as taking more ownership of housework in the home.

Although the link between work and family seems particularly challenging for employees with children, single and childless employees were not immune to the negative consequences of the pandemic's restrictions. Previous studies have reported that single employees have experienced a reduced quality of life during the pandemic, as they may have a greater risk of experiencing loneliness and a reduced degree of significance for others (Carnevale & Hatak, 2020).

2.2.4 Differences in seniority and age

Teleworking before the pandemic was seen as a selling point to make a job more attractive, but has through the pandemic become a job demand to prevent infection spreading. This requirement may have led to employees who initially did not want to telework, due to, e.g., lack of skills or experience, now being obliged to do so. As teleworking became the new normal, this also required a massive increase in competence development, for both employees and employers. Such as how to support each other when you can only meet via virtual meetings. This can be quite the challenge for employees who e.g., lack digital skills or have just gotten employed, when it suddenly becomes a requirement to work fully digital by yourself at home.

During the pandemic, employees with long seniority in an organization, may already have more experience of teleworking, than employees with shorter seniority. This can also be seen from statistics before the pandemic, where fewer younger employees (under 30 years) had a teleworking agreement, and where the majority of those who had it were in the age group 40-54 and 55-70 years (SSB, 2021). New employees with shorter seniority had to learn new routines to balance work and family, as well as master virtual meetings and new software in a much shorter time during the pandemic. Li et al. (2020) claimed that new employees and employees with short seniority have during the pandemic, been forced to learn new skills at record speed, compared to employees with longer seniority. These employees try to learn new segments of the job in the fastest way possible, and in many cases without any support. This can lead to fast and solution-oriented learning, but also hopelessness and confusion by not mastering the challenges with teleworking (Li et al., 2020; Bjursell et al, 2021).

For new employees, the pandemic's demands regarding teleworking, may have contributed to the most intense period of their careers. Unlike employees with longer seniority, the changes during the pandemic were not as foreign to them. But for many employees, going to their physical workplace and socializing with colleagues, is a very essential part of their well-being at work (Li et al., 2020; Bjursell et al, 2021). In a Lithuanian study, they found

that 40% of employees wanted to return to their physical workplace after the pandemic. The predominance of these employees were younger employees, who missed physical interaction in their workplace, but also older employees with longer seniority due to lack of digital skills and self-discipline. But the study also showed a predominance of employees who were satisfied with the experience of teleworking during the pandemic, in all age groups (Raišienė et al., 2021a).

There is a common consensus that younger generations ("generation x" and "millennials") are better at absorbing new digital skills than older generations (Raišienė, Rapuano & Varkulevičiūtė, 2021). However, the pandemic required that both qualified and unqualified employees had to telework, which showed that younger employees may not be as efficient at teleworking as previously thought. Furthermore, this can be seen in the fact that younger employees are in a life stage with a lot of change already (e.g., forming a family, raising young children and the desire to develop their careers). There is also reported a gender difference between younger employee's experience of teleworking during the pandemic, where women value the opportunity to telework more than men. Young men report a lack of mutual trust between employees and managers, lack of team spirit and feedback, as well as increased challenges with self-organization in contrast to young women (Raišienė et al., 2021b).

2.3 Theoretical framework

The self-determination theory of Deci & Ryan (2000) claims that humans are motivated to develop and change once the three universal psychological needs are met. These needs are autonomy, relatedness and competence, and enable people to become self-determined and experience a high degree of intrinsic motivation. Previous research that has used this theory, has shown that WFB is influenced by these three psychological needs (Senécal et al., 2001; Roche & Haar, 2020).

2.3.1 Self-determination theory

The workplace is often seen as an employee's second home. Since the workplace plays such an important role in employees' lives, a growing proportion of research wants to explore how satisfied employees are with their working lives. In previous research, the three psychological needs: autonomy, relatedness and competence, are recognized as absolutely essential for employees' well-being, health and work motivation (Roche & Haar, 2020). According to Deci & Ryan (2000), individuals who fulfil their psychological needs are perceived to be curious, lively and self-motivated. They inspire others and seek out new learning opportunities for self-development and competence development. In the same way, they show commitment, effort and freedom of action. Deci & Ryan's description can be interpreted as positive features of human nature, but sometimes these positive features can diminish or disappear if not regulated. Based on this description, the psychological needs can be understood as a dynamic spectrum, where both the individual employee and the environment plays a significant role.

Deci and Ryan (2000) are further known for the self-determination theory (SDT), which contains the three psychological needs mentioned. SDT does not mainly focus on how strong a single need is for an individual, but rather to what extent the individual is able to

have the needs adequately covered in a social context, such as in the workplace (Einarsen & Skogstad, 2011).

SDT can also be understood as a motivation theory, where the development of human inner resources and behavioural regulation are central. Motivation is a core concept in the field of psychology, which further has impacted biology, cognition and social competence and regulation. In its entirety, the term motivation can be defined as, "*psychological processes that initiate, control and maintain behaviour*" (Einarsen & Skogstad, 2011, p. 69, my translation). Motivation is a very complex phenomenon, which can occur in various situations. Employees can e.g., be motivated by an inner desire to do something, or by rewards, salaries and/or pressure. Based on this example, one can see that motivation can be divided into both intrinsic and extrinsic motivation. Intrinsic motivation occurs when the individual has an inner desire to do something, and extrinsic motivation occurs when something from the environment affects this desire (Ryan & Deci, 2000).

Motivation can be seen in connection with the SDT, by questioning whether an individual's behaviour is driven by intrinsic and extrinsic motivation, and if the behaviour is based on autonomy. Intrinsic motivation is seen as the preferred form of motivation, which according to Deci & Ryan (2000) gives the individual more job performance, endurance and creativity, and increased self-esteem and well-being. Deci & Ryan (2000) further argue that there may not be a single phenomenon that reflects human positive potential, as clearly as intrinsic motivation. Although the SDT views intrinsic and extrinsic motivation as two separate phenomena, the theory also recognizes that there is a spectrum between them. In which external regulation (extrinsic motivation) such as organizational values, can be internalized and transformed into internal regulation (intrinsic motivation) (Brunelle & Fortin, 2021).

Because of this, the SDT refers to a spectrum of motivational types, such as: 1. amotivation, 2. external regulation, 3. introjected regulation, 4. identified regulation, 5. internal regulation. Amotivation (1) is at one end of the spectrum, and is a state of lack of intention to act, where the individual does not act at all or acts without intention. Following, in external regulation (2), the individual find motivation through external influencing factors, like e.g., bribes. Furthermore, introjected regulation (3), means that the individual does not accept their actions as their own, e.g., to avoid feeling guilt. Following, identified regulation (4) is about the individual is conscious and accepting the action they perform. Finally, internal regulation (5) deals with the individual performing actions that have been evaluated and that are in accordance with the individual's values and needs. External regulation shares many qualities with intrinsic motivation, even though they are considered external. This because the actions are done to achieve results, instead of inherent enjoyment (Ryan & Deci, 2000; Brunelle & Fortin, 2021).

Deci & Ryan (2000) claim that where individuals place themselves on the spectrum is strongly influenced by the degree to which their three psychological needs are fulfilled. In the following part, I will take a closer look at the three psychological needs in the SDT, related to the experience of teleworking during the pandemic.

2.3.2 Autonomy

The concept of autonomy contains values such as freedom and independence. To have the freedom and independence to work on your own terms, make decisions, and have a satisfying degree of self-control and co-determination (Kaufmann & Kaufmann, 2015).

Previous research has shown that autonomy has a positive effect on job satisfaction, organizational commitment, and intrinsic motivation, which can increase the opportunities for personal development (Novaes et al., 2018). Autonomy is considered a psychological need and an important resource for employees' quality of life.

Einarsen & Skogstad (2011) claim that autonomy is made of three qualities, which are inner control placement (locus of control), free will and perceived choice in one's own actions. The first quality, locus of control refers to if an individual's places the cause of things that are happening, internally (in themselves), or externally (in others). For example, we might think that we are the reason we succeed in a job, and not our leader. The second quality within the concept of autonomy, is the experience of free will. Where this quality could be fulfilled by e.g., being able to have a say in the workdays structure. The third quality is perceived choice in one's own actions. At work, it's necessary for employees to have opportunities to make choices. But at the same time, employees are underlying their leader, where the leader has the right to control, monitor and guide the employees. In cases where leaders or others have too much control, the employee may experience stress, anger, discomfort or resignation. Employees as well as all human beings, can feel strong opposition to others controlling and deciding over their actions and choices. This phenomenon is called *reactance*, and is defined as a psychological process that involves reacting negatively to someone limiting ones freedom of choice. The degree of reactance is different from individual to individual. That's why it's important to let employees participate and be co-determinant about their work situation, since it so fundamental for our well-being (Einarsen & Skogstad, 2011).

In SDT, the concept of autonomy is closely linked to intrinsic motivation, and its positive characteristics. It has also been shown that too much pressure, monitoring and control, too tight of deadlines and strict evaluations, can for many employees reduce their degree of intrinsic motivation. This can happen because such elements draw attention to more external conditions. Using too much external control in the form of reward or punishment, may reduce employee's autonomy, which in turn can weaken their creativity and problem-solving skills. In contrast, by facilitating employees' choices, one gives them more faith in their own decisions and achievements, which in turn increases intrinsic motivation (Einarsen & Skogstad, 2011).

Autonomy has long been thought to be an advantage of teleworking. In fact, when working away from their supervisors, employees have more opportunities to choose how, when, and where to work. For example, to have the flexibility to start the workday earlier or later. Brunelle & Fortin (2021) claim that there is a sense of freedom that comes with being physically and mentally removed from the physical workplace, away from physical supervision. By teleworking, employees have greater autonomy to organize, plan and perform work-related activities. The flexibility regarding the location, timing and execution of work-related activities, creates an environment that promotes a satisfying level of autonomy for many teleworking employees. However, considering the related challenges with increased autonomy due to teleworking, there could be employees who may experience less autonomy by the expectations to always be "online", as well as the lack of informal communication leading to more scheduled meetings.

Since employees that telework are separated from their colleagues and leaders, they are dependent on having the skills to establish interpersonal relationships over the internet. This also have an effect on how connected the employees are to their colleagues, and can lead to social isolation and loneliness if not maintained (Brunelle & Fortin, 2021).

2.3.3 Relatedness

The need for relatedness and social connection has developed through evolution, where humans have and still are dependent on other people for survival. We are not created to be alone, and if the need for relatedness is not met, it can have negative consequences for our health and well-being. This also related to all social domains in our lives, as well as the workplace. Often the need for relatedness doesn't mean we have to have a lot of social connections, but rather have some stable relationships with a certain quality (Einarsen & Skogstad, 2011).

Social support is often defined as the employee's experience of being taken care of, and being a part of a supportive social network (Usman et al., 2021). Social support can be divided into four perspectives, which are 1. emotional support, 2. appraisal support, 3. information support and 4. instrumental support. *Emotional support* (1) refers to feeling valued and accepted, and to receive empathy and reassurance. *Appraisal support* (2) is about receiving realistic feedback on actions, performance or personal qualities. *Information support* (3) implies receiving useful information, suggestions or advice, that could be used for problem solving. *Instrumental support* (4) refers to receiving practical help in the form of, e.g., help, time or money (Einarsen & Skogstad, 2011). In SDT, Deci & Ryan (2000) point out that satisfying the need for relatedness is essential for belonging and connection to other people in all life-stages and domains. Furthermore, relatedness has an important role in the desire for internalization, where increased desire gives more probability to be aware when support from the environment is present, as well as desires to take responsibility and give support to others in the same environment. In this way, relatedness can also be understood as a mutual social responsibility.

Social support in the workplace can be divided into *management support* and *colleague support*, both of which play a significant role in the employee's everyday work life. During the pandemic, it has been particularly important to provide social support and relatedness, where employees are otherwise more isolated from their usual sources of support, such as friends and family. If employees feel isolated, it might lead to decreased energy, loneliness and frustration. Management support during the pandemic can be valuable for reducing concerns regarding, e.g., job insecurity and general frustrations. Colleague support, in turn, can be provided in knowledge sharing and emotional support, to reduce loneliness or exhaustion (Behzadnia & FatahModares, 2021; Usman et al., 2021).

The perception of social support and relatedness at work, is also linked to the degree of social support in one's private life, such as *family support*. A study by Usman et al. (2021) during the pandemic, found that employees with a high degree of family support during the pandemic had lower levels of emotional exhaustion and insecurity, than employees with low levels of family support. Through the pandemic, family support has become more important, especially if one has experienced reduced support from leaders or/and colleagues. In addition to family support, support from other social life domains, such as from friends, has also been shown to strengthen employee's mental health during the pandemic (Alnazly et al., 2021). Several negative consequences can occur from lack of relatedness such as health problems and low productivity. On the other side, a high level of relatedness is connected to positive outcomes, such as increased well-being, creativity and job performance (Einarsen & Skogstad, 2011).

Previous research on teleworking and relatedness, shows that weak social ties with leaders and colleagues and social isolation is a key challenge with teleworking (Brunelle & Fortin, 2021). This because teleworking lacks physical interactions, and where virtual interactions

may become more formal and less dynamic. Therefore, teleworking may make it more difficult to have unformal conversations, while building a healthy relationship. Since teleworking can affect the quality of communication, employees may not relate or connect with their colleagues the same way they might have done in a physical workplace.

2.3.4 Competence

The need for competence is defined by Deci & Ryan (2000) as the need to feel that we master and develop in what we do. To experience mastery in interaction with our different life domains, this requires us to seek out developmental challenges (Einarsen & Skogstad, 2011; Brunelle & Fortin, 2021). Being able to believe in ourselves and in our skills, is also an important factor within the need for competence in the SDT. The Canadian psychologist Albert Bandura (Deci & Ryan, 2000; Bjursell et al., 2020) introduced the concept of *self-efficacy*, which points out the importance of experiencing an authentic feeling of mastery, for creating success in future learning situations. Self-efficacy can be understood as the belief that one is capable to control and execute necessary behaviour, to produce a specific performance. An individual with a high degree of self-efficacy perceives themselves as competent and skilled in their tasks, while a person with a low self-efficacy is unsure and doubts their own competence and performance. Something that characterizes a person with high self-efficacy, is their high drive to master difficult challenges, and their tendency to react positively and offensive to negative feedback. In contrast, a person with low self-efficacy tends to react negatively and defensively, when faced with negative feedback (Kaufmann & Kaufmann, 2015). Fulfilling the need for competence refers to experiencing freedom to tackle, learn and master challenges. This requires that the leaders and significant others in the workplace, value that their employees experience mastery at work. But in practice, it can be difficult to keep up that all employees fulfil their need for competence (Einarsen & Skogstad, 2011).

Teleworking can contribute to several positive outcomes when it comes to competence. The fact that employees are given the opportunity to telework can be a recognition from the management and leaders, that they believe that their employees are qualified to do a good job even without physical supervision, and further help build self-confidence. In addition, previous research has shown that employees who telework are more productive, since they have increased autonomy (Novaes et al., 2018). Increased autonomy gives the employees more time to perform the tasks they like to do, and less interruption from colleagues and leaders. When employees and their leaders experience a high productivity level, it could mean that the employees are performing their job correctly and at the right time (Brunelle & Fortin, 2021). A challenge during the pandemic was that both qualified and unqualified employees had to telework, where this could affect many employees need for competence. In a Swedish survey during the pandemic, 49% of the respondents answered that they had insufficient digital knowledge both at work and privately. Another report estimated that around 40% of employees will require reskilling, in skills like self-management, flexibility and stress tolerance after the pandemic. These skills are especially connected to teleworking, where teleworking require more responsibility from the employee in terms of managing both the physical and psychological work conditions themselves (Bjursell et al., 2021).

Previous research by Takahashi et al. (2014) looked at the connection between competence development and WFB, where it was identified that the competence to balance work and private life was seen as important for the respondents. Furthermore, a study done on

female entrepreneurs, showed that it was a common concern to maintain the quality of their professional careers by satisfying the company's requirements for products and services, as well as to maintain a high quality of their personal lives (Takahashi et al, 2014). As these studies have showed, there is still a need for competence development due to the increased digitalization in our everyday life.

2.3.5 The thesis research hypothesis

Based on the literature and theory that has been presented, I have designed three hypotheses to answer the thesis first research question, related to the relationship between WFB, autonomy, relatedness and competence. In chapter four I will try to confirm/disprove the following hypotheses:

- **Hypothesis 1 (H1):** There is a positive connection between the need for autonomy and WFB, while teleworking during the pandemic.
- **Hypothesis 2 (H2):** There is a negative connection between the need for relatedness and WFB, while teleworking during the pandemic.
- **Hypothesis 3 (H3):** There is a negative connection between the need for competence and WFB, while teleworking during the pandemic.

2.4 Work after the pandemic

To investigate the thesis second research question, about the future work life after the pandemic, it will be essential to explore the societal thoughts on this topic. Research done on this topic is still minimal, but with a gradual increase (Seaton et al., 2021; Wang et.al., 2020), this also because the topic has gained a lot of interest by the public eye during the pandemic.

During the pandemic teleworking was a big discussion topic, where the Norwegian nationwide channel "NRK", gave the population the opportunity to ask experts pandemic-related questions, where teleworking was a recurring theme (Waage, 2021). In online articles several writers came forward with their opinions about teleworking, where some were for and against a more digitalized workday. Some argued for continuing to use teleworking, for increased freedom, less disruption and time savings, e.g., in transport (Egge, 2021). In contrast, there were also arguments that teleworking caused too much flexibility, where someone can take advantage of this freedom by taking extra "time off", since no one monitors that you work actively all day (Schultz, 2021). The debate about teleworking engaged people of all ages, where the column "25 under 25" in Norway's largest newspaper also appeared in the debate. Here, there were arguments for great benefits of teleworking in the future, such as increased flexibility and better logistics in the everyday life (Norén, 2022).

Due to this societal interest, the second research question in this thesis can be understood as more exploratory. This to see what probabilities and wishes employees have for their everyday work life after the pandemic.

3 Methodology

In this chapter the thesis methodology will be described, and the thesis reliability and validity will be commented on throughout the chapter. First, the thesis research method and design will be presented, followed by a more in-depth look at the data collection process. Furthermore, the measuring instruments, variables and statistical analyses will be described. Next, the thesis will comment on what measures that have been used to increase the quality of the study, based on reliability and validity. Finally, the chapter will explain the thesis ethical considerations.

3.1 Research method and design

The purpose of this study is to examine the relationship between employees' experience of teleworking during the pandemic, specifically related to their work-family balance (WFB), autonomy, relatedness and competence. To dive into these social phenomena, the respondents' own subjective thoughts and considerations will form the basis of this thesis data material. Quantitative research method gives the researcher the opportunity to go into the breadth of the phenomenon, by examining any comparability in a large sample, which provides the opportunity to generalize any findings. The quantitative research method is based precisely on the fact that the social phenomena chosen, show such great stability that quantitative measurements and statistical analyses will be meaningful to perform (Ringdal, 2018).

The design chosen for this thesis is a cross-sectional design and is the most used design types in the quantitative research method, and often associated with surveys. This type of design implies that you have a large, representative sample, and perform a standardized query (e.g., surveys) at a specific time. The purpose of a cross-sectional design is to be able to give a statistical description of different contexts. Since this type of design takes place within a specific time, it's only suitable to give an overview of the current phenomenon's context. This then means that the results from this thesis cannot say anything about the phenomena development over time, which limits the results (Ringdal, 2018).

3.2 Description of the sample - population, sample and data collection

The population is the group of people whom the results are meant to be considered valid, where a subgroup in the populations is referred to as a sample. In this way, the sample should be representative of the population the thesis is meant to target (Kleven & Hjordemaal, 2018).

In the process of finding a suitable sample, the research questions were taken as a starting point. Based on this, it was quickly recognized that most Norwegian companies and organizations that have experienced teleworking during the pandemic, could be relevant candidates. Due to the financial and practical limitations of the thesis, a non-probability sample was made, more specifically a convenience sample. A non-probability sample is characterized by not knowing the individual population members' chance of being selected to participate (Ringdal, 2018). However, a convenience sampling can be understood as a selection of the members who are easiest to reach (Langdridge, 2006). This type of selection method can affect the external validity of the study, which deals with the

generalizability of the thesis, as well as be influenced by over-representation of certain groups, such as gender (Ringdal, 2018).

In this thesis, the external company was selected based on accessibility, as well as my own criteria: 1. a company size of over 400 employees, 2. a company that has used teleworking during the pandemic, and 3. a Norwegian company. The first criteria were introduced due to recommendations on sample size in statistical analyses, especially factor analysis. Field (2018) claims that a sample size of 100 respondents will correspond as a weak sample, 300 respondents are equal to a good sample and 1000 respondents will correspond as an excellent sample size for a factor analysis (Field, 2018). The second and third criteria were essential for answering the thesis research questions, and to see if the knowledge gained through the analyses may be relevant to other companies. As well as whether the answers from the respondent in this thesis may be of relevance to other employees.

After some searching, I found a company that met my criteria, and who wanted to participate in this thesis-project. The external company that was selected to participate in this project will be treated anonymously in this thesis. The chosen company is in the engineering and consulting industry, with a company size of more than 3000 employees both nationally and internationally. It was decided to carry out the data collection, using an electronic survey. The survey was sent out internally via email to 265 employees, where 116 employees completed the survey. The survey was deployed at the end of March 2022, where the data collection period lasted one week. By sending the survey internal through the company's mail system, this avoided the exchange of person data. Further, it was chosen to have one reminder email to improve the response rate.

The response rate for this project landed at 43%. Baruch & Holtom (2008) claim that studies conducted at an organizational level, which seek respondents from different levels (e.g., leaders and employees), are likely to experience a lower response rate, where the standard is between 35-40%. In general, a response rate of 40% can be understood as a low to moderate response rate. The reasons for the lower response rate can be many, where Morton et.al. (2012) claim that there is a general decline in "volunteering" and social participation, as well as an increased frequency of requests from research groups and more use of internal surveys. Morton et al. (2012) further claim that even if a study has a low response rate, this does not automatically mean that the study has low validity, but simply a potentially greater risk for it, which will also apply for this thesis-project.

3.3 Description of the measuring instruments

3.3.1 The survey

The process of creating a survey, started with a deep dive into relevant existing literature and research. In this process, previous standardized measuring instruments that have been used in similar areas of interest where identified. The chosen instruments were "the General Nordic questionnaire for psychological and social factors at work" (*QPS Nordic*), "the Knowledge Intensive Working Environment survey target 2.0" (*KIWEST 2.0*) and "the Work Design questionnaire" (*WDQ*).

QPS Nordic is a survey with the purpose of mapping psychological and social factors in the Nordic working life. This instrument was developed in 1994 at the request of the Nordic Council of Ministers, where the aim was to ensure quality comparability in measurements and data on psychosocial and organizational factors in employees work life. QPS Nordic

was tested in the four Nordic countries: Norway, Sweden, Denmark and Finland, and contains a total of 129 questions, of which 80 questions together form 26 different scales (Nordic Council of Ministers, n.d.; Skogstad et al., 2001). QPS Nordic has good psychometric properties, and can also be used across professional groups, which also makes it possible to compare different workplaces and occupations (Wännström et al., 2009). Examples of previous studies that have used QPS Nordic, are a Swedish study by Wiegner et al. (2015) and a Norwegian study done by Testad et al. (2009).

The second instrument that was used to create this thesis survey was KIWEST 2.0. KIWEST was originally created by the four largest universities in Norway: NTNU, UiB, UiO and UiT, with the aim of creating a tool that could be adapted to the entire higher education sector and create a holistic picture of the psychosocial factors found in a Norwegian work environment. The request to create such a tool was also emphasized by the Norwegian Labor Inspection Authority, which required the institutions in 2010/2011 to improve their documentation of their employees' psychosocial environmental factors. Based on this, the intervention program ARK ("work environment and work climate surveys") was launched in 2013, which also included the KIWEST survey. Today, NTNU has taken ownership of the ARK program. In this study, the choice was made to use version 2.0 of the KIWEST survey. KIWEST 2.0 contains 119 questions that together constitute 27-33 latent variables. These variables are inspired by other standardized scales, from other Nordic and European research groups (Undebakke et al., 2015; Christensen & Undebakke, 2013). Examples of previous studies that have used KIWEST, are two Norwegian study done by Torp et al. (2018) and Innstrand & Christensen (2018).

The third and last instrument used in creating this thesis survey, was the WDQ. The WDQ survey was created by Morgeson & Humphrey (2006) after an extensive analysis and integration work that evaluated shortcomings in previous predecessors' surveys on work design. This work resulted in a survey of 21 job characteristics, which showed a high level of reliability, convergence and discriminant validity, which solved two of the most central criticisms of previous predecessors: too few job characteristics and weak psychometry (Bayona, Caballer & Peiró, 2014). WDQ focuses not only on what tasks an employee must perform at work, but also the relationships between the employee and their current work environment. Examples of previous research that have used WDQ, are an Australian study by Moussa, Bright & Varua, (2017).

The advantage of using standardized measuring instruments is increased internal validity. Internal validity refers to the interpretation that presents a relationship between variables, i.e., whether X actually affects Y (Kleven & Hjordemaal, 2018). By using standardized measuring instruments, this provides that the items that have been used have shown a good internal validity for several previous studies. Surveys are often referred to as a highly standardized data collection method (Ringdal, 2018). This is because all data collection takes place in the same way for all respondents, e.g., all respondents receive the same question with the same question formulation in a survey. The purpose of increasing a survey's standardization level is the ability to greater eliminate various measurement errors and obtain more reliable data (Ringdal, 2018).

Both QPS Nordic and KIWEST 2.0 have been translated into several different languages, including Norwegian and English. WDQ on the other hand has also been translated into several languages, including English, but has not been translated into Norwegian. Therefore, it's my own translations that have been used for the WDQ, in the constructions of the Norwegian survey in this thesis. A challenge that happened during the translations

process was to translate the Norwegian word "stivbeint" into English. The direct translation of the word into English is "stiff legged", which does not make any sense in the context the word is used in Norwegian. Therefore, I ended up with several English alternatives that could fit, such as rigid, formal and strict. To quality assure and get feedback on all my translations, a pilot test was conducted. The pilot test included 20 respondents that first completed the pilot survey, and after participated in a verbal conversation about the survey. The feedback from the pilot, clarified any complicated foreign words, were the word "stivbeint" chosen translation was "rigid", as well helped making clear question formulations.

Furthermore, the scales that have been selected from QPS Nordic, KIWEST 2.0 and WDQ will be presented in the following subchapter.

3.3.2 The variables

Based on the thesis first research question, the following variables have been chosen: WFB, autonomy, relatedness and competence. The thesis main dependent variable, WFB, will be set up against the thesis three main independent variables, autonomy, relatedness and competence.

Other independent variables selected for this thesis are gender, age, length of employment, number of household members and number of children and age. These independent variables are also control variables, and are chosen to strengthen the statistical models and any findings in the thesis results. The survey in this thesis included a total of 79 questions, where 18 of the questions asked about employees' previous and current experience of teleworking and their wishes for their future work life. These 18 questions are self-composed, with input from both my supervisors and the external company (see question 8-13 and 69-79 in appendix C). To quality assure these self-composed questions, the pilot test also focused on the formulations and translations of these questions as well.

The sample for this thesis were employees in the external company, where the goal is to capture their subjective opinion. As mentioned, the survey in this thesis is based on scales from standardized measuring instruments, where selected scales from these instruments composed of several items. This because the scales are intended to measure latent variables, which can be understood as variables that measures a phenomenon that cannot be measured or observed directly (Ringdal, 2018). Therefore, the latent variables are composed of several items, to cover the largest possible aspect of the chosen phenomenon. The scales selected from QPS Nordic, KIWEST 2.0 and WDQ, all build on a 5-point Likert scale. Since it cannot be guaranteed that the individual respondent in this thesis interprets the answer alternatives in the same way, this may weaken the reliability of the measures. On the other hand, the construct validity of the thesis could be seen as a strength. This because the scales used are based on standardized instruments, where the scales cover the most important aspects of the different phenomena used in this thesis-project.

Furthermore, the variables and scales used will be presented. In this presentation, it will be explained how they are operationalized, and why they are included in this thesis survey.

Work-family balance: The scale for the dependent variable WFB, was taken from the KIWEST 2.0 survey. In this survey, the scales “work-family facilitation (WFF)” and “work-family conflict (WFC)” were used. Innstrand, Langballe, Falkum, Espnes, & Aasland developed the index “work to family facilitation” and “work to family conflict” (Wayne, Musisca & Fleeson, 2004) to investigate this mutual influence (Christensen & Undebakke, 2013). A more recent study by Innstrand et al., (2015) claims that the further developed scales used in KIWEST 2.0, create a good psychometric measure of WFB, with the relationship between WFF and WFC. This is also claimed by Wayne et al. (2004) who originally created the scales, where the internal consistency reliability for both scales was good (WFF: $\alpha = .72$ and WFC: $\alpha = .82$). In addition, the correlations between the scales showed that they were relatively independent of each other. A high score on both scales, indicates that the work domain has little negative impact on the family domain, and that the work domain has a positive impact on the family domain. Since the WFC scale is reversed, a high score on WFC indicates that the work domain has little negative impact on the family domain (Undebakke et al., 2015). Both subscales operate with a 5-point Likert scale, from “*strongly disagree*” to “*strongly agree*”. The scales and items used to measure WFB are listed in table A-1 in the appendix.

Autonomy: The scales for the independent variable autonomy, were taken from QPS Nordic. In QPS Nordic, autonomy is divided into the subcategory “control over work tasks”. QPS Nordic claims that the concept of control refers to individuals’ experience of freedom or the opportunity to exercise control, regulate and make decisions over one’s own working life. This subcategory is further divided into three subscales which are, “positive challenges at work”, “control over decisions” and “control over work intensity”. In this thesis these three subscales were used to measure the phenomenon of autonomy. A high score on these scales indicates that the respondent experiences a high degree of positive challenges in their everyday work, control over work-related decisions and work intensity (Skogstad et al., 2001). QPS Nordic has shown good internal consistency reliability where the scales “positive challenges at work” showed Cronbachs alpha on $\alpha = .78$, “control over decisions” showed $\alpha = .72$ and “control over work intensity” showed $\alpha = .83$. In addition, all three scales were shown to be independent of each other (Skogstad et al., 2001). Previous research has also supported QPS Nordic to be a good instrument for evaluating health-related factors at work (Wännström et al., 2009). Furthermore, all three subscales operate with a 5-point Likers scale, from “*very seldom or never*” to “*very often or always*”. The scales and items used to measure autonomy are listed in table A-2 in the appendix.

Relatedness: The scale for the independent variable relatedness, was taken from KIWEST 2.0. KIWEST 2.0 operates similarly to QPS Nordic with subcategories. In KIWEST 2.0, the area of “resources in colleague fellowship” has been chosen to measure relatedness in this thesis. This subcategory is divided into four subscales, which are: “cohesion in work teams”, “social community at work”, “inclusiveness and social responsibility” and “social climate”. A high score on these scales indicates that the respondents’ experiences good collaboration between colleagues at their own unit, a high degree of community between colleagues and an inclusive work environment (Christensen & Undebakke, 2013). The scale “social climate” is presented as an average measure, since the different statements shed light on several different climatic conditions in a workplace. All the four subscales showed good internal consistency reliability, where the scale “cohesion in work teams” showed $\alpha = .82$, “social community at work” showed $\alpha = .86$. “inclusiveness and social responsibility” showed $\alpha = .80$ and “social climate” showed $\alpha = .78$. These subscales also reported to be relatively independent of each other (Innstrand et al., 2015). Previous research has validated the KIWEST 2.0 instrument and considered the instrument to be a good

psychometric scale for measuring the phenomenon of relatedness (Innstrand et al., 2015). All four subscales operate with a 5-point Likers scale from "*strongly disagree*" to "*strongly agree*". The scales and items used to measure relatedness are listed in table A-3 in the appendix.

Competence: The scale for the independent variable competence, was taken from WDQ. For this thesis the subcategory "knowledge characteristics", was used to measure competence. Knowledge characteristics reflect what kind of knowledge, skills and abilities that are expected of an employee. This area is divided into five subscales which are: "job complexity", "information processing", "problem solving", "skill variety" and "specialization". A high score on these scales together, corresponds to the respondents experiencing a high degree of information processing and problem solving, as well as a high degree of skill variation and the need for specialized skills. Further, the scale "job complexity" is reversed, where a high score on this scale corresponds to a low degree of overly complex work tasks (Morgeson & Humphrey, 2006). The WDQ-developers Morgeson & Humphrey (2006), claim that the instrument is a good measure of various job characteristics in a modern working life. This can also be reinforced by the subscale showing a good internal consistency reliability, where the scale "job complexity" showed $\alpha = .87$, "information processing" showed $\alpha = .87$. "problem solving" showed $\alpha = .84$, "skill variety" showed $\alpha = .86$ and "specialization" showed $\alpha = .84$. These scales also show to be relatively independent of each other, and the psychometric values are also confirmed by a Spanish study by Bayona et al. (2014). Further, the five scales operate with a 5-point Likers scale from "*strongly disagree*" to "*strongly agree*". The scales and items used to measure competence are listed in table A-4 in the appendix.

Teleworking: in the survey there is 18 questions related to the employee's home office and future orientation. The variables 1. ideal work week after the pandemic 2. ability to separate work and family in a good way and 3. ability to return to the physical workplace with minimal disturbances in routines/personal life. Different variables that was dummy coded from five to three groups, e.g., "agree", "neutral" and "disagree".

Gender: is a control variable in this thesis, previous research has shown that there is a difference between gender and WFB during the pandemic (Bjursell et al., 2021, Carnevale & Hatak, 2020; Meyer et al., 2021; Wang et al., 2020; Tomei, 2021). The variables gender is measured at a nominal level, where the included groups ("man", "woman" and "other") are mutually exclusive from each other (Ringdal, 2018). To make it easier to interpret this variable in the analysis, it's dummy coded to 0 and 1 (Ringdal, 2018). Gender is dummy coded where female = 0 and is the reference category, and male = 1. There where zero respondents who chose the alternative "other".

Age: is also a control variable in this thesis, previous research mentioned in this thesis has shown that there is a difference between age and WFB during the pandemic (Li et al., 2020; Bjursell et al, 2021). The variable age is measured at an ordinal level, where the groups have a natural order between them, which in this thesis is the number of years (Ringdal, 2018). The variable age is divided into six groups, from "18 - 25 years", "26 - 35 years", "36 - 45 years", "46 - 55 years", "56 - 65 years" to "65 years and over". Age is dummy coded into three variables, where first variable: "18-35 years" = 1 and all others = 0. Second variable, "36-55 years" = 1 and all others = 0. Third variable, "55 years-65+ years" = 1 and all others = 0.

Seniority: is the third control variable in this thesis, where previous research has shown that there is a difference between seniority and WFB during the pandemic (Li et al., 2020; Bjursell et al., 2021; Raišienė et al., 2021). This variable like the age variable, is measured at an interval level. The groups have fixed distances between each other, in this thesis is the number of years in employment (Ringdal, 2018). The variable seniority is divided into five groups, from "0 - 2 years", "3 - 9 years", "10 - 19 years", "20 - 29 years" to "30 years and over". Seniority is dummy coded into three variables, the first variable: "0-2 years" = 1 and all others = 0. Second variable, "3-9 years" = 1 and all others = 0. Third variable, "10 years-30+ years" = 1 and all others = 0.

Household: is a control variable in this thesis, where previous research has shown that there is a difference between individual who live alone and with other household members and WFB during the pandemic (Tomei, 2021; Carnevale & Hatak, 2020). The variable household is measured at an ordinal level, in this thesis is number of household members, including the respondent. The variable household is divided into five groups, and dummy coded into two variables, where the first variable is "1 person" = 0 and is the reference category, and "2 persons/couple" = 1.

Children is the fifth and last control variable in this thesis is number of children and their age categories. Previous research has shown that there is a difference between the percents of children and the child's age and the parents WFB during the pandemic (Syrek et al., 2021; Armour et al., 2020; Kumar et al., 2021; Collins et al., 2013). The variable "number of children" is divided into five groups and measured at a nominal level (number of children). The variable that measures the children's age is divided into five groups as well, from "0 months - 11 months", "1 year - 5 years", "6 years - 9 years", "10 years - 15 years" to "16 years - 19 years". This variable is measured at an interval level. Further, number of children is dummy coded into two variables, where the first variable is "household without children" = 0 and is the reference category, and "household with children" = 1.

3.4 Description of the analysis

To analyse the statistical analyses in this thesis, IBM SPSS version 28 was used. In this subchapter, the statistical analyses used will be presented. This involves univariate-, bivariate- and multiple regression analysis.

3.4.1 Univariate- and bivariate analyses

To be able to say something about the thesis descriptive statistics, univariate and bivariate analyses was used. Descriptive statistics provide useful information about the findings made in a study, and could be information about e.g., average values or frequencies in the current range. Univariate analyses explore each variable in a data set, individually.

Bivariate analysis that has been used in this thesis is correlation analysis and principal component analysis (PCA). In the bivariate correlation analysis, Pearson's correlation coefficient (r) has been used to measure these correlations, where this coefficient is based on values from -1 to +1, where plus indicates a positive correlation and minus indicates a negative correlation. A perfect correlation is at either +1 or -1, and a correlation of 0 indicated no connection between the two variables (Pallant, 2013). More specifically, a coefficient between 0.10 and 0.29 indicates a weak covariation, a coefficient between 0.30

and 0.49 indicates a medium covariation, and a coefficient between 0.50 and 1.0 indicates a strong covariation between two variables (Field, 2018; Pallant, 2013).

To ensure the quality of the scales and items that have been used in this thesis, it was chosen to use a factor analysis. A factor analysis is a bivariate analysis used to examine whether the chosen items represent the phenomenon that they indicate to measure (Ringdal, 2018). Factor analysis is used to reduce a large number of related items to a more manageable number, so that they can be used further in other analyses e.g., in a multiple regression. Factor analysis can be divided into two groups: factor analysis (FA) and principal component analysis (PCA). FA is often used in the earlier stages of the research process to explore the relationships between a set of variables. PCA, on the other hand, is often used later in the research process to confirm specific hypotheses or theories that underlie a set of variables (Field, 2018).

In this thesis, it has been chosen to use an PCA, to see if there are connections in the dimensions WFB, autonomy, relatedness and competence, regarding the hypothesis. Field (2018) claims that the lower limit for an acceptable factor charge is 0.30, and where factor charges of .60 or above are considered strong. Therefore, factor charges below 0.30 should be excluded. The goal is that the items show an acceptable level, that again confirms that the items are one-dimensional, and together significantly explains the same phenomenon. In this study, an oblique rotation (direct oblimin) was used as extraction and rotation method for the PCA, this because an oblique rotation assumes that the items are correlated. In addition, a reliability analysis will be carried out, where the goal is for the selected items to be well operationalized. This is done by measuring Cronbach's alpha (α), which measures the internal consistency (reliability) of the scales. Cronbach's alpha varies from 0 to 1, with a satisfactory level of .70 or higher (Heale & Twycross, 2015; Pallant, 2013).

3.4.2 Significance testing and effect size

In this thesis, significance testing was used to improve the quality of the results and increase the internal validity of the study. To be able to test a hypothesis, calculation of significance level is crucial. This since the significance level is a measure of how likely it's that the results are due to coincidences (Ringdal, 2018). In this thesis, the significance test, chi-square of independence, was used to explore the relationship between different categorical variables.

Although the term chi-square can apply to any test statistic that uses chi-square, the term often refers to Pearson's chi-square test of independence, commonly used for two categorical variables. This test statistic is based on comparing the frequencies observed in certain categories, with the expected frequencies in these categories by chance (Field, 2018). A challenge with Pearson's chi-square is that the smaller the sample, the less true the chi-square statistics are compared with the expected distribution measured. Therefore, one should avoid using Pearson's chi-square test when more than 20% of the cells in a table have values below 5. This may mean that the sampling distribution of the test statistics is too different from the chi-square distribution, to be accurate. If Pearson's chi-square test showed that 20% of the cells have values below 5, a likelihood ratio test (also called G-test) was used. This also because the tables were 3x2 or 3x3, if the tables had been 2x2 a Fisher's exact test would have been used instead of Pearson's chi-square.

Further, the likelihood ratio test is based on the relationship between the observed and the expected frequencies predicted by the model (Field, 2018).

For large samples, the likelihood ratio will often be the same as Pearson's chi-square, but more different for small samples. Common to both chi-square tests is that they determine whether the variables are associated or not. Further, chi-square tests are interpreted as problematic when it comes to causal explanations. This because the causal directions cannot be tested empirically using cross-tabulations on cross-sectional data, and it's not possible to investigate whether other confounding variables influence the result (Ringdal, 2018).

When reporting results in quantitative research, both significance and effect size should be included. Effect size measures the level of strength between two variables (Ringdal, 2018). Like significance, effect size depends on both power and sample size. When interpreting the effect size, an effect size of 0.2 equals a small effect, 0.5 equals a moderate effect and 0.8 to a large effect (Sullivan & Feinn, 2012). If the effect size is high, it will be possible to detect an effect also in a smaller sample, but if the effect sizes are small, it could require larger sample sizes (Sullivan & Feinn, 2012). This will apply as a limitation in this thesis, since the effect sizes are low and with a small sample size.

3.4.3 Multiple regression

Multiple regression is used to analyse the relationship between one single dependent variable and several independent variables, through models. Thus, multiple regression can be used to investigate whether adding a new variable to an existing model can increase the model's overall predictive power (Pallant, 2013). In this thesis, a hierarchical multiple regression analysis will be used, this to detect any proportional correlation between the thesis variables. The independent variables autonomy, relatedness and competence, will be measured against the dependent variable WFB. Further, the model will contain two blocks, with the control variables in block 1, and the independent variables in block 2.

In this thesis, the correlation coefficient, *adjusted R²* (ΔR^2), will be used to describe the blocks predictability. Using ΔR^2 one can examine the effect of each block, when entering a new variable. Thus, see which variables have the greatest impact on the dependent variable (Field, 2018). In addition, the model contains the unstandardized coefficient (*B*) and the standardized regression coefficient (β). *B* can be understood as the relationship between variables with the unit of measurement used for each factor, and β indicates which variables have the greatest significance for the model (Ringdal, 2018; Pallant, 2013). To ensure the quality of the regression analysis, it was also tested for the absence of various assumptions: non-linear parameters, autocorrelation, heteroskedasticity, outliers and multicollinearity (Pallant, 2013).

3.5 The quality of the study

Research results are always associated with some degree of uncertainty, therefore the researcher has a great responsibility to present professional and credible knowledge to the public (Kleven & Hjordemaal, 2018). To ensure that credible research results are published, it will be of great importance to ensure the quality of the study. This quality assurance involves systematically reviewing the requirements set for what corresponds to good quality research. In this subchapter, the thesis will present which steps that have been

taken to ensure the quality of this thesis. This will be done by looking more closely at the thesis dimensionality, reliability and validity, as well as addressing any measurement errors that may affect the thesis and ethical considerations.

3.5.1 Dimensionality, reliability and validity

There are three characteristics that are used to assess the quality in various research projects, which are dimensionality, reliability and validity. The dimensionality of a study tells something about a set of indicators that operationalize a theoretical concept, and that they in fact measure one or more dimensions (Ringdal, 2018). To ensure the quality of this thesis dimensionality, a PCA will be used. This is to find out whether the scales measure one or more dimensions, and see if internal correlations can provide answers to whether there is a connection between the items in each scale (Ringdal, 2018). The dimensionality in this study shows an acceptable reliability score, shown in table E-1 in the appendix.

Reliability refers to the consistency of a measure, where a high reliability means that repeated measurements with the same instrument give the same results over time (Ringdal, 2018). It's not possible to accurately calculate reliability, but one can estimate reliability using three attributes, which are homogeneity/internal consistency, stability and equivalence (Heale & Twycross, 2015). Cronbach's alpha is the most common test to find an instrument's internal consistency. Cronbach's alpha can be used for instruments that have more than two answers, and results in a number between 0 and 1. An acceptable reliability score is 0.7 or higher. As mentioned earlier, all the scales used in this thesis, refer to a sufficient Cronbach's alpha value above 0.7. The second attribute, stability, can be tested by e.g., test-retest. In this study, the correlation coefficient is used to determine the level of stability, where a correlation of 0.30-0.50 is moderate and a correlation higher than 0.50 is strong. The last attribute for measuring reliability is equivalence. Equivalence is measured through inter-rater reliability. This can be tested by measuring whether there is a match between the responses from different respondents, when they are asked to rate an instrument (Heale & Twycross, 2015). The reliability of this study can be understood as good, based on the Cronbach's alpha values of the various instruments used. This is because all the scales used show an $\alpha = 0.7$ or above, where Cronbach's alpha stands for both general reliability and internal consistency (see 3.3.2).

Next, the validity of a study can be understood as the extent to which a concept is accurately measured (Heale & Twycross, 2015). In contrast to reliability and dimensionality that can be estimated through tests, validity cannot be calculated in numbers, but requires a theoretical foundation to interpret the degree of validity (Ringdal, 2018). Validity can be divided into different types: "construct validity", "internal validity" and "external validity" (Kleven, 2008). Construct validity is about whether we measured the theoretical concept that we want to measure (Field, 2018). One thing that helps to strengthen the construct validity in this thesis is that the instruments are based on standardized instruments. A threat regarding the construct validity could be the issue of using own translations. This since my translations haven't been tested prior to this study, but a pilot test was conducted to strengthen the translations.

By using standardized instruments this also strengthens the internal validity as well (see 3.3.1). But internal validity also consists of being able to draw conclusions about causal relationships, but since this thesis-project is based on a cross-sectional design, it will not be possible to say anything that predicts development over time. This can thus be

considered a limitation for this thesis. Furthermore, the external validity can be defined as to what extent one can generalize the findings to other situations and samples (Kleven, 2008), where this has previously been mentioned as a possible weakness for this thesis (see 3.2). This because a convenience sampling was used to select a sample from the population, this could affect the generalizability of the study. Furthermore, the thesis overall low to medium response rate, small sample size and effect size, must be seen as limitations.

3.5.2 Measurement errors

Any study can be affected by measurement errors, where method deviations are one of the main sources for measurement errors to occur. Measurement errors undermine the validity of a study, and can questioned whether the research findings are only a result of coincident or systematic measurement errors. Random measurement errors are caused by external factors that cannot be controlled, and systematic measurement errors can occur within e.g., the measuring instruments, measuring methods, the data collection process or within the researcher's subjective assessments. Both types of measurement errors have serious consequences for a study's findings, but systematic measurement errors are more damaging (Podsakoff, MacKenzie & Podsakoff, 2003). This because systematic measurement errors will create a deviation from the true value, for each time you measure. Podsakoff et al. (2003) claim that measurement errors can often occur in studies where the data material for both the dependent and the independent variable are measured by only one researcher once, something that has occurred in this thesis. Therefore, it will be further discussed which measurement errors that may be applicable to this thesis's results, and what steps have been taken to counteract them.

In all measuring instruments there will be a risk of measurement errors. This applies to both the scales and items used, where more measurement errors will reduce the validity. This can e.g., be that the same scale format (e.g., Likert scale) is used throughout the survey, which can lead to acquiescence biases. The advantages of a survey using the same scale format is that it can be perceived as tidier and more efficient to accomplish, but this could also result that the respondents rush through the survey without thinking through the questions (Podsakoff et al., 2003). This can easily lead to the respondents choosing to be positive or neutral to questions, which in its entirety can give measurement biases in the data material. In this study, most of the questions have the same scale format, but to prevent this type of measurement error, some items have also been reversed to test whether the respondents have read through the question.

Another reason that can create measurement errors related to the items is question formulations (Ringdal, 2018). If the items contain complicated words and concepts, the respondents may misunderstand and relate the question to other theoretical concepts or misinterpret the question and answer uncritically. This can create an artificial perception of the measured phenomenon, which can weaken the validity. To avoid this, as mentioned earlier, a pilot test was conducted, focusing on just this. Further, missing data deals with unanswered questions, where missing data in this survey is very low with an average missing data of less than 5% on each question. This in turn can strengthen the thesis external validity.

Measurement errors can also occur in connection with data collection or respondents in the sample. Measurement errors that occur due to the sample are often random measurement

errors, e.g., respondents ticking off wrong answers, forgetting to answer all questions or answer based on socially desirability (Ringdal, 2018; Podsakoff et al., 2003). Random measurement errors can be difficult to prevent since they are out of the researcher's control, but measures have been taken to prevent social desirability in this thesis. This by having neutral question formulations, anonymity and clarify that participation will not affect the relationship with their employer. This was also something the external company in this thesis wanted to highlight, since social desirability had been a challenge in previous internal surveys.

Based on this subchapter, it will be fair to exercise caution when it comes to drawing conclusions from the results from this thesis's results, based on appointed measurement errors.

3.5.3 Ethical considerations

As a researcher, you are obliged to follow research ethics norms (Ringdal, 2018). This refers to ensuring professional freedom and research independence, and respecting the human dignity of the respondents. This e.g., by informed consent, anonymity, data storage and confidentiality. Since this project gathered personal data, that was indirectly identifiable, the project had to be reported to Norwegian Centre for Research Data (NSD). NSD thus assessed the project and gave its approval to complete the data collection (see appendix B). furthermore, an information letter was also attached to the digital survey, where all participants had access to read about the thesis-project's purpose, their rights related to participation, and storage of data material, as well as information about voluntary participation, anonymity and confidentiality (see appendix D). To participate in this project, it was a requirement that they ticked off that they give their consent to participate. Since this project used an electronic survey, participants could at any time choose to return to the front page of the survey, to remove their consent, which meant that all data they had entered would be deleted.

Furthermore, it was also specified in the information letter that participation in the survey would not affect the participant's relationship with their employer. Since some of the departments selected to participate had relatively few employees, it was also specified that there may be an opportunity to be recognized by an external company based on the demographic questions. However, to prevent further identification, it was chosen to exclude questions, which required text answers. Other measures taken to prevent identification was to not track IP addresses. This increases the participant's anonymity, but also creates a challenge by not having an overview of whether the same participant answers the survey more than once. This can be put on as a limitation of the thesis itself, as this becomes an unknown factor.

In the next chapter the results of the statistical analyses will be presented.

4 Results

This chapter will present the results of the statistical analyses that have been performed in SPSS. First, the quality assurance of the scales through PCA and Cronbach's alpha will be presented. Next, the thesis dependent and independent variables will be described. Further, the correlations between all variables will be presented, as well as the results from bivariate analyses. Finally, the chapter will present various univariate analyses on independent variables, through chi-square tests. Since the thesis sample size is relatively small, the tables must be read and interpreted with caution.

4.1 Quality assurance of indices (PCA)

In table E-1 in the appendix, one can see the results from the thesis's PCA. To ensure the quality of the items in the survey, several PCAs were conducted to measure whether the items measured what they were intended to measure. Since all the factors had the same measurement level, it was decided to carry out a joint PCA. After several runs, it was chosen to highlight the items that showed a satisfactory factor level and did not charge in multiple factors at the same time. To check this, factor charges below 0.3 were taken out of the analysis. With that, autonomy and relatedness ended up with four items, and competence ended up with three items. All these three factors showed to have good reliability, autonomy $\alpha = 0.77$, relatedness $\alpha = 0.78$ and competence $\alpha = 0.79$. Since several of the items that were to measure different dimensions within autonomy, relatedness and competence were removed, this will affect the scope of the overall dimension. Thus, the items that have been selected will help to measure various individual aspects of these phenomena, instead of measuring the totality of them.

4.1.1 Correlations between items

To see if the items in the different scales help to measure the same, a correlation analysis was performed. For scales that contain a small number of items (less than 10 items), it may be difficult to obtain an acceptable Cronbach's alpha value, where it could be appropriate to refer to inter-item correlations (Pallant, 2013). In tables G-1, G-2, G-3 and G-4 (see appendix G), one can see the correlations between the items in the different scales that have been used to measure WFB, autonomy, relatedness and competence. As mentioned, a coefficient between 0.10 and 0.29 indicates a weak covariation, a coefficient between 0.30 and 0.49 indicates a medium covariation, and a coefficient between 0.50 and 1.0 indicates a strong covariation between two variables. In Table G-1 the coefficients vary from 0.25 to 0.69, where all are significant at 0.01 level. In Table G-2, the coefficients vary between 0.25 to 0.63, and all are significant at 0.01 level. In Table G-3, the coefficients vary between 0.29 to 0.59, and all are significant at 0.01 level. In Table G-4, the coefficients vary between 0.53 to 0.61, and all of which are significant at 0.01 level.

4.2 Descriptive statistics for dependent variables

Table 4-1

Mean, standard deviation, skewness and missing for the dependent variables

	Number of items	Range	Mean	SD	Skewness	Missing
Work-family balance (n = 114)	5	1 – 5	2.65	0.60	-0.21	2
Autonomy (n = 115)	4	1 – 5	3.83	0.68	-0.68	1
Relatedness (n = 116)	4	1 – 5	4.28	0.53	-0.92	0
Competence (n = 114)	3	1 – 5	3.90	0.60	-0.03	2

In table 4-1, you can see a table of descriptive statistics on the thesis dependent variables (WFB, autonomy, relatedness and competence). The variable's skewness is within the recommended limit under 1 (Field, 2018), where the variable relatedness is in the higher spectre with a skewness value of -0.92. Furthermore, all variables have a very low missing data of less than 5%, which helps to strengthen the thesis external reliability. Furthermore, the standard deviation shows a relatively low value with a range between 0.53 to 0.68, which indicates that the respondents' answers are close to the mean (Field, 2018). The mean for the variables are also close to the middle (3.0), apart from relatedness where the respondents' average answer is 4.28, which corresponds to more agreement in the questions and statements they were presented.

4.3 Descriptive statistics for independent variables

Table F-1 in the appendix shows the respondents' distribution based on gender, age, seniority, household members and the presence of children. In this survey there were a total of 116 respondents, where 63% were men and 43% were women. This bias in the gender distribution can be seen as problematic, as the desire is to strive for an even distribution. This skewed gender distribution is also something that reflects the company's industry, where statistics from the "Norwegian employer and employee register" show that the engineering industry in 2020 had a gender distribution of 80% men and 20% women (the directorate for higher education and competence, 2020). Furthermore, most respondents were in the age group 36-55 years (53%), with a seniority between 3-9 years (48%). Furthermore, the descriptive statistics showed that 10% of the respondents lived alone, and where 66% of the respondents lived in households with children during the pandemic.

For the independent variables that measure employee's future orientation, one can see in table F-1 in the appendix, that a large preponderance of employees wants to use their physical workplace more, than their home office. 59% answer that they want more days a week at their physical workplace than at their home office, 32% want to work only at their physical workplace, and only 10% want to work more days a week at their home office

than their physical workplace. Overall, 69% of the respondents want to use a “hybrid solution” in the future, where they have some days digital and some physical. Furthermore, one can see what motivating factors have an impact on getting back to one’s physical workplace, as well as factors for continuing with teleworking. The two biggest motivating factors for returning to their physical workplace were, more physical interaction with colleagues (32%) and easier collaboration/teamwork (19%). The two biggest factors for continuing to telework were, more flexibility (38%) and less disruptions (29%). In the table F-1, one can see how the respondents score on their subjective ability to separate work and family in a good way. On this question, 24% were neutral, 35% disagreed and 40% said they agree that they can do it in a good way. Finally, in the table F-1, one can see how the respondents score on their subjective ability to return with minimal disruption to their normal routines/personal life. On this question, 16% were neutral, 3% disagreed and 81% said they agree that they can return with minimal disruption to your normal routines/personal life.

4.4 Bivariate correlation analysis

Table 4-2

Correlations between dependent and independent variables

	1	2	3	4	5	6	7
1. Work-family balance	1	0.28**	0.10	-0.09	0.12	-0.18	-0.16
2. Autonomy		1	0.17	-0.08	-0.03	0.10	-0.04
3. Relatedness			1	0.08	0.07	0.07	0.09
4. Competence				1	-0.13	0.01	0.24*
5. Man					1	0.00	-0.06
6. Low age (18 -35)						1	-0.21*
7. Household with children							1

Note. ** $p < 0.01$. * $p < 0.05$.

In the correlation analysis in Table 4-2, the highest correlation is between WFB and autonomy ($r = .28, p < .01$). This indicates a weak positive correlation between the two variables, where this correlation is the only one between the dependent variable (WFB) and the independent variables. This correlation may mean that high WFB can lead to higher autonomy, or vice versa, but even if these variables covariate, this does not mean that there is causality for the result. To strengthen a causal relationship it’s presupposes the use of longitudinal studies and the possibility of excluding all other external variables (Langdridge, 2006). Furthermore, the second highest correlation is between competence and households with children ($r = .24, p < .05$), which indicates a weak positive correlation between the two variables. Finally, one finds the correlations between young age and households with children ($r = -.21, p < .05$). This correlation indicates a weak positive correlation between the variables.

4.5 Multiple regression

4.5.1 Hierarchical linear regression – WFB

Table 4-3

Hierarchical linear regression analyses of factors explaining WFB, B, β and ΔR^2

Work-family balance			
	B	β	ΔR^2
Model 1			0.06*
Man	0.12	0.10	
Age low (18-35)	-0.27*	-0.21*	
Households with children	-0.24*	-0.20*	
Model 2			0.13**
Autonomy	0.25*	0.29*	
Relatedness	0.08	0.08	
Competence	-0.01	-0.01	

Note. ** $p < 0.01$. * $p < 0.05$. Reference categories; female, age medium/high (36+) and household without children.

Table 4-3 presents the results from a hierarchical linear regression analysis for the thesis dependent variable, WFB. The explained variance, *adjusted* R^2 (ΔR^2), is used as a measure of how well the model fits the data material (Field, 2018). The first model includes background variables (gender, age, presence of children) where the ΔR^2 is 0.06. When including the study's independent variables autonomy, relatedness and competence, the ΔR^2 increased to 0.13. The independent variables turn out to explain only 13% of the variations within WFB, which gives the model a relatively low predictive power. This can be understood in that other external variables than those examined in this thesis, may have a greater impact on WFB, and if these were included in the model they may had increased the predictive variance.

The beta values (β) and the p-values give us the opportunity to analyse the significance of the independent variables for the dependent variable. For the dependent variable (WFB), the following variables are significant at $p < .05$, low age, households with children and autonomy. The beta values show that autonomy ($\beta = .29$) is most important for WFB, followed by low age ($\beta = -.21$) and households with children ($\beta = -.20$). This may indicate that the higher the degree of perceived autonomy, the higher the WFB, and where young employees who live in households with children, risk lower WFB. Surprisingly, gender did not appear to be of importance to WFB in this model, as well as for relatedness and competence.

4.5.2 Assumptions for regression analysis

The assumptions for performing a linear regression analysis are based on: linearity, normality (non-normally distributed residuals), absence of autocorrelation, homoskedasticity and absence of multicollinearity. To test whether the assumption for linearity was met, scatterplots were used to measure whether the regression line was linear (see figure K-1 in the appendix). These plots showed that there were no problems with linearity for the thesis dependent and selected independent variables. To check whether the precondition for normality had been met, Cook's distance test was used. This is to see if certain variables had an excessive influence on the regression model. If Cook's distance is above 1, this can be problematic compared to normality (Pallant, 2013). In this thesis, Cook's distance was found to be 0.212 or below, which meets the assumption of normality. Furthermore, Durbin Watson was found to be at 2.03, which meets the requirement of autocorrelation. The next requirement is homoskedasticity, where scatter plots were used (see figure L-1 in the appendix) and shows that the plots meets the requirement for homoskedasticity.

To avoid that the independent variables correlate too strongly, multicollinearity in the correlation matrix was checked. If the matrix is characterized by multicollinearity, this may contribute to uncertain results in the subsequent regression analysis (Field, 2018). None of the correlations between the independent variables in this thesis indicate that there should be a problem with multicollinearity, which are correlations of over 0.80 (Field, 2018). The highest correlation in the matrix was between WFB and autonomy ($r. = 0.28$). Nevertheless, a multicollinearity analysis was carried out with measurement of tolerance and variance inflation factor (VIF), where the limit of acceptable VIF is under 10 and the limit of tolerance is over 0.10 (Field, 2018, Pallant, 2013). The VIF values in this study were 1.1 or lower, and the tolerance values were 0.91 or above. This indicates that there should be no problems with multicollinearity.

4.6 Chi-square test of independence

To explore whether there is a significant relationship between two categorical variables, a chi-square test of independence was used. The test is applied to the following independent variables: 1. "ideal work week after the pandemic", where 59% wanted to have more physical workdays than digital, 32% wanted to work only at their physical office and 10% wanted to work more digital workdays than physical. 2. "ability to separate work and family in a good way", where 40% agreed, 24% was neutral and 35% disagreed. Lastly, 3. "ability to return to the physical workplace with minimal disruption to routines/personal life", where 81% agreed, 16% was neutral and 3% disagreed.

To examine these variables, the control variables age, gender, and households with children was selected, like in the regression analysis. Tests were mainly run with Pearson's chi-square test (X^2), but also with the Likelihood ratio chi-square test (G^2).

4.6.1 Ideal workweek after the pandemic

Table 4-4

Chi-square-test: ideal workweek after the pandemic, by age groups

Group	Age					
	Low age (18-35)		Medium age (36-55)		High age (56-65+)	
	n	%	n	%	n	%
More physical workdays, than digital	25	66	32	53	11	64
More digital workdays, than physical	1	3	10	16	0	0
Only physical workdays	12	32	19	31	6	35

Note. n = 116. $G^2(4) = 9.29, p < 0.05$

The variable “ideal workweek after the pandemic” was measured in age, gender and households with children. Table 4-4 shows the result of a likelihood ratio chi-square test that examine the relation between age and the chosen independent variable. The relation between these variables was significant, $G^2(4) = 9.29, p < .05$, and indicated that employees in all age groups were more likely to want to work more physical workdays after the pandemic, rather than more digital or only physical. The table also shows that employees in all age groups want to rather work only physical workdays, than a workweek with more digital than physical workdays. The table also show that employees in the medium age group are more likely to want to have more digital workdays than physical, in relation to employees in the low and high age group. Furthermore, the relationship between the chosen independent variable and the control variables gender and household with children, turned out to be not significant (see table H-1 and H-2 in the appendix).

4.6.2 Ability to separate work and family in a good way

Table 4-5

Chi-square-test: ability to separate work and family in a good way, by gender

Group	Gender			
	Man		Woman	
	n	%	n	%
Agrees	24	33	22	51
Neutral	24	33	5	12
Disagrees	25	34	16	37

Note. n = 116. $\chi^2(2) = 7.24, p < 0.05$

The variable “ability to separate work and family in a good way” was measured in age, gender and households with children. Table 4-5 shows the result of a Pearson’s chi-square test that examine the relation between gender and the chosen independent variable. The relation between these variables was significant, $\chi^2(2) = 7.24, p < .05$, and indicates that more female employees both agree and disagreed, more than male employees, where the female employees was divided on this question. It can also be seen that more male employees than female employees are neutral on this question. Furthermore, the relationship between the chosen independent variable and the control variables age and

household with children, turned out to be not significant (see table I-1 and I-2 in the appendix).

4.6.3 Ability to return to the physical workplace with minimal disruption to routines and personal life

Table 4-6

Chi-square-test: ability to return to your physical workplace with minimal disruption to your normal routines/personal life, by households with/without children

Group	Children			
	With children		Without children	
	n	%	n	%
Agrees	48	73	46	92
Neutral	14	21	4	8
Disagrees	4	6	0	0

Note. n = 116. $G^2(2) = 9.26, p < 0.05$

The variable “ability to return to the physical workplace with minimal disruption to routines/personal life” was measured in age, gender and households with children. Table 4-6 shows the result of a likelihood ratio chi-square test that examine the relationship between households with/without children and the chosen independent variable. The relationship between these variables was significant, $G^2(2) = 9.26, p < .05$, and indicates that employees with households without children most agree that they can return to their physical workplace with minimal disruption to their routines/personal lives, then employees with households with children. But most employees with households with children agree that they can return with minimal disruption, than those who disagree. The table also shows that more employees with households with children were neutral on this question than employees with households without children. Furthermore, the relationship between the chosen independent variable and the control variables age and gender, turned out to be not significant (see table J-1 and J-2 in the appendix).

4.7 Answering the study’s hypothesis

- H1.** There is a positive connection between the need for autonomy and WFB, while teleworking during the pandemic (Brunelle & Fortin, 2021; Wang et al., 2020). This hypothesis was confirmed from the regression analysis and the bivariate correlation analysis.
- H2.** There is a negative connection between the need for relatedness and WFB, while teleworking during the pandemic (Usman et al., 2021; Alnazly et al., 2021; Brunelle & Fortin, 2021). This hypothesis was not met, either in the regression analysis or in the bivariate correlation analysis.
- H3.** There is a negative connection between the need for competence and WFB, while teleworking during the pandemic (Novaes et al., 2018; Bjursell et al., 2021; Takahashi et al, 2014). This hypothesis has not been met, but it can be seen in the regression analysis that the beta value is negative, but not significant.

5 Discussion

The purpose of this thesis is to investigate what connections there are between work-family balance (WFB), autonomy, relatedness, competence and future orientation, while teleworking in a large engineering company during the Covid-19 pandemic. This research question is elucidated through two research questions: 1. *To what degree did teleworking during the Covid-19 pandemic affect employees in a large engineering company, experience of work-family balance, autonomy, relatedness and competence?* and 2. *Has teleworking during the Covid-19 pandemic affected what employees of a large engineering company think is best for themselves and their colleagues after the pandemic?*. To answer the first research question, three hypotheses was made, where they will be discussed in more detail in the following subchapters. The results from the analyses refer to some expected findings, as well as other surprising findings that also will be discussed in more detail.

5.1 Research question 1

The thesis first research question asked how the three psychological needs for autonomy, relatedness and competence (based on the self-determination theory (SDT)), had affected teleworking employees' WFB during the pandemic. SDT says that humans are motivated to develop and change once these three psychological needs are met. Furthermore, there will be a discussion around these three psychological needs towards WFB, while teleworking.

5.1.1 H1: Autonomy and WFB

The hierarchical regression matrix ($\beta = .29$) and the correlation analysis ($r = .28, p < .01$) show that there is a significant positive relationship between autonomy and WFB while teleworking during the pandemic. This connection is also in line with theory and previous research (Brunelle & Fortin, 2021; Wang et al., 2020; Deci & Ryan, 2000). As mentioned earlier, the effect sizes can be interpreted as relatively low (Sullivan & Feinn, 2012) for both the regression analysis and the correlation analysis, where this is something that should be considered when interpreting the results. The concept of autonomy ended up including items from only one of the subcategories in QPS Nordic, instead of all three subcategories. This helps to explore a specific part of the phenomenon of autonomy, instead of the phenomenon as a whole. This because the theoretical concept is not always in accordance with the empirical data one is left with after the data collection process. The concept of autonomy in this thesis focused mostly on control over work intensity, which is still a large part of the concept of autonomy (Einarsen & Skogstad, 2011).

The results may indicate that autonomy helps to strengthen the employee's WFB during the pandemic's lockdown. Autonomy has long been seen as an advantage of teleworking, with increased flexibility and freedom (Brunelle & Fortin, 2021; Syrek et al., 2021). This flexibility applies to several areas within the concept of autonomy, where co-determination in work placement, time and implementation, creates an environment that promotes a satisfactory level of autonomy for several employees who telework (Novaes et al., 2018). In addition, increased autonomy in the work domain has been shown to have a positive impact on the WFB both by teleworking and by working in a physical workplace (Akkaya et al., 2021). Previous research (Novaes et al., 2018) have also shown that an increased

degree of autonomy has a positive effect on various factors such as job satisfaction and intrinsic motivation, which can further lead to personal development. The findings from this thesis also support previous studies in the field, but it must be noted that the effect sizes are low. But on the other hand, a larger sample size could show a stronger connection between autonomy and WFB.

In relation to the thesis theoretical framework, autonomy plays a major role in the experience of intrinsic motivation, and vice versa. Autonomy is largely about the ability to have a say and not feel that others control one's own life. In situations where employees feel controlled by other people, they may experience stress, anger and discomfort. These feelings can be understood as negative emotions, also called reactance, which can weaken one's intrinsic motivation (Einarsen & Skogstad, 2011). Intrinsic motivation and the ability to make choices in one's own life is also seen in connection with WFB. The opportunity to plan one's own workday can contribute to the easy conflicts that can arise between the work and family domain (Wang, et al, 2020, Kühnel et al., 2016). This e.g., that you have time to deliver/pick up the children in kindergarten/school, do the laundry during the lunch break or to go for a walk if you need a slightly longer break.

However, although this thesis results met the hypothesis of a positive connection between autonomy and WFB, it's also relevant that an increased degree of autonomy also comes with a requirement to have good self-discipline, so boundaries between work and family don't become too fluid (Syrek et al., 2021). This because teleworking employees are not "monitored" by either colleagues or leaders, who check if they are actually doing their work tasks. This can strike both ways, where one can end up with e.g., taking too many or too long breaks, or not taking breaks at all. Further, intrinsic motivation is also linked to burnout, which can be seen as a possibility of an increased freedom, where one may end up working too much (Meyer et al., 2021).

5.1.2 H2: Relatedness and WFB

For hypothesis number two, the hierarchical regression matrix ($\beta = .08$) and the correlation analysis ($r = .10$, $p = .30$) showed that there was no significant negative correlation between relatedness and WFB while teleworking during the pandemic. Relatedness as a concept ended up consisting of items from only one of the subcategories in KIWEST 2.0, instead of all four. Thus, like the concept of autonomy, this means that parts of the phenomenon were explored, rather than the whole phenomenon. The subcategory used was "inclusiveness and social responsibility", where high scores indicate an inclusive work environment at one's work unit (Christensen & Undebakke, 2013). One can see from the descriptive statistics that relatedness is the variable that has the highest mean score of all the composite variables ($M = 4.28$, $SD = 0.53$) (see table 4-1). This indicates that the average respondent agreed more than they disagreed with the questions about their perceived relatedness while teleworking during the pandemic. However, this does not provide a basis for the relationship between relatedness and WFB in this thesis.

Previous research (Usman et al., 2021; Alnazly et al., 2021; Brunelle & Fortin, 2021) presented in this thesis indicated that relatedness and WFB could have a negative correlation, where this is due to previous findings where lack of social support and networks has been challenging for several employees during the pandemic. The challenges of being a digital employee have taken a toll on several during the pandemic, where increased likelihood of experiencing social isolation, less dynamic conversations and challenges in

establishing deep relationships with colleagues has characterized the workplace's social arena (Brunelle & Fortin, 2021; Alnazly et al., 2021). On the other hand, some companies have chosen to focus more on social measures for employees during the pandemic, to prevent these challenges from impacting their employees. As the respondents show in this sample, the mean score has shown that they experience an inclusive work environment, even during the pandemic. A possible reason why this hypothesis was not met, may be precisely this, in that the employees have experienced a high degree of relatedness, and where this did not present a challenge related to WFB. This may be due to active leader support and/or colleague support, or good family support through the pandemic (Alnazly et al., 2021).

When it comes to SDT, Deci & Ryan (2000) say that experiencing a satisfactory degree of relatedness will be important for the experience of belonging, inclusion and connection to other people in all life stages and domains. Furthermore, SDT says that an increased degree of relatedness helps to increase the degree of internalization, which further helps to promote social responsibility between the parties in the environment to provide mutual support to each other. Experiencing relatedness can give several positive ripple effects such as increased collaboration, productivity and WFB, as well as reducing loneliness and fatigue (Behzadnia & FatahModares, 2021; Usman et al., 2021). Since the sample in this study respondents had a mean of 2.65 ($SD = 0.60$), which is more towards the dissenting side, it's surprising to see that the degree of relatedness was not related to WFB in this study. To look more deeply at this finding, it will be important to look at other reasons that may have led to this result, when it deviates from the theoretical framework.

A possible reason may be that the respondents have simply become accustomed to the new digital everyday life over long periods of time with teleworking. The report from Ingelsrud & Bernstrøm (2021) claim that those who have the best WFB are often those who telework every day, and that they often make a clear distinction between work and the family roles, this to be able to disconnect from work when the workday ends. Considering this, one can add questions to whether if this study had been sent out at the beginning of the pandemic, when teleworking still was fresh for most employees, and if this would have given other results. Since the study was sent out towards the end of the pandemic, perhaps several of the respondents had already developed new routines and habits for what is a "sufficiently" satisfactory level of social support and relatedness.

Other ways the need for relatedness could have been met during the pandemic are the opportunity to create digital meeting places (e.g., digital lunchrooms), the opportunity to meet other colleagues outdoors and not least, create a team spirit of support. This can help create a healthy balance between work and family, were employees still feel part of the community they had before the pandemic occurred. In addition, this can also help new employees, who may have been hired during the pandemic, to establish relationships with their colleagues.

5.1.3 H3: Competence and WFB

For hypothesis number three, the hierarchical regression matrix ($\beta = -.01$) and the correlation analysis ($r = -.09$, $p = .38$) showed that there was no significant negative correlation between competence and WFB, while teleworking during the pandemic. Competence as a concept ended up consisting of three items from the subcategory "job complexity" in WDQ, instead of using all items from all the five subcategories. This, like

the concept of autonomy and relatedness, means that parts of the phenomenon were explored, rather than the whole phenomenon. According to WDQ, job complexity is about to what extent the work tasks are too complex and difficult to perform. This because work that involves tasks that require the use of several skills at a high level is more mentally demanding and challenging (Morgeson & Humphrey, 2006). From the results of the hierarchical regression analysis and the correlation analysis, the effect sizes tend towards the negative side, but was not significant. Furthermore, it can be seen in Table 4-1 that the mean for the competence variable was 3.90 ($SD = 0.60$), where this indicates that that the average respondent leaned a little more towards to agreeing than disagreeing with the questions related to their perceived competence while teleworking during the pandemic. However, this does not provide a basis for the relationship between competence and WFB in this study.

Previous research (Novaes et al., 2018; Bjursell et al., 2021; Takahashi et al., 2014) presented in this thesis indicated that competence and WFB could have a negative correlation, this due to previous findings where a lack of competence development at work has been challenging, both before and during the pandemic. Some of these challenges have been shown to be related to the fact that not only qualified employees were asked to telework, but also unqualified employees, who may never have teleworked before (Bjursell et al., 2021). Having enough knowledge about their own work tasks is essential to be productive, but also not least to experience mastery. Being able to experience that you can complete work task in a way that satisfies yourself and the company you are employed in, can contribute to increased intrinsic motivation to want to learn and further develop your skills (Brunelle & Fortin, 2021).

Other challenges that previous research has referred to is lack of competence development during the pandemic. This can be seen from a report where 40% of employees will require reskilling in skills such as self-management, flexibility and stress tolerance. These skills are especially related to teleworking where they themselves have the most responsibility for their own productivity and development (Bjursell et al., 2021). Although work-related competence can be interpreted as competence in the physical and direct work tasks, it also includes competence in indirect skills such as e.g., stress tolerance. Building up this indirect skill can help manage complex work tasks, as not being as difficult and overwhelming to perform over time. Additionally, a study by Takahashi et al. (2014) points out that maintaining a high level of work competence and balancing family is a real concern for many employees.

When it comes to SDT, competence, plays a significant role in the experience of intrinsic motivation. Deci & Ryan (2000) define competence as the need to feel that we master and develop in what we do. If one does not experience a satisfactory degree of competence, this can lead to several negative consequences such as reduced well-being, meaningfulness and productivity. Deci & Ryan (2000) also point out that employees who feel competent in their job, experience an inner drive to seek out new challenges and increased self-efficacy. Self-efficacy points out the importance of experiencing an authentic feeling of mastery, to create success in future learning situations. Individuals with a high degree of self-efficacy further see themselves as competent and skilled in their tasks. Since the hypothesis between competence and WFB was not met, it's useful to look more closely at various reasons that may cause this result.

One possible reason why the hypothesis was not met in this thesis may be that since the sample scored high on autonomy, this indicates they have more freedom in their choice of work tasks. Where they might rather choose to perform the tasks that are easy, and that they already know they are good at. By not challenging yourself with new and demanding tasks, but wanting and completing tasks you already master, can also be productive. But on the other hand, competence development is precisely about taking on these difficult and complex tasks, where you have enough self-efficacy to be able to complete them.

Another reason may be that the respondents in this sample are so used to working digitally, that the transition to a fully digital everyday life did not have a great impact on their experience of competence. Norway is considered to be a highly digitalized country when it comes to the labor market (Ingelsrud & Bernstrøm, 2021). The Working Environment Act also requires employers to facilitate competence development for their employees (Working Environment Act, 2006, § 4-2). Due to this, it's conceivable that the respondents in this sample did not experience a large enough difference in their experience of competence during the pandemic, and further did not affect their WFB to a large enough degree. This could also be because the external company in this study, actively focuses on and value their employees' competence development, both before and during the pandemic.

5.1.4 Independent variables/control variables and WFB

When it comes to the thesis control variables, this includes the variables: gender, low age (18-35) and household with/without children. The other control variables: seniority, household members, children's age and number of children were subtracted. In the regression analysis, gender surprisingly did not have a significant effect on WFB in this sample ($\beta = .10$, $p = .28$). Previous studies (Bjursell et al., 2021, Carnevale & Hatak, 2020; Meyer et al., 2021; Wang et al., 2020; Tomei, 2021) have found that gender can be understood as significant for measuring WFB. This because gender differences are reported by women contributing more to housework and suffers more often than men from the negative psychological consequences of the pandemic, by e.g., role conflict between work and family and low concentration levels (Tomei, 2021). Furthermore, it's also reported that mothers are 50% more often disturbed by their children in their home office than fathers.

There may be various reasons why gender differences did not have an impact in this thesis. Norway is considered to be a country with a well-equal working environment, where women and men equally support their households (Innstrand, 2010). This because most women in Norway are active in the workforce and not staying at home with children, where this might be the reasons why gender is not as important in this study. It has been speculated that teleworking during the pandemic may have helped to change traditional gender roles, by encouraging men to gain more experience and joy by spending more time with family and taking more ownership in housework (Tomei, 2021). The fact that men and women together share challenges related to the family domain can make both parties experience a more even distribution of WFB. This may also be the case in this thesis, where perhaps several employees experience an even division of labour, when they had to telework together, and take responsibility for the family at the same time. However, since the sample also has a skewed gender distribution (63% men and 43% women), this should be included in the assessment. Where the result might have been different if there had been more female respondents represented.

Furthermore, in the regression analysis, employees with low age (18-35) had a significant negative impact on WFB ($\beta = -.21, p < .05$). This is an exciting result that is also consistent with previous research done on WFB and younger employees during the pandemic (Raišienė et al., 2021a; Raišienė et al., 2021b). This because younger employees are already in a challenging life period, where starting a family, raising young children and building their career is seen as important. Furthermore, maintaining a healthy WFB has been challenging for many young employees during the pandemic (Raišienė et al., 2021b).

Finally, it can be seen in the regression analysis that households with children also had a significant negative impact on WFB ($\beta = -.20, p < .05$). This is also consistent with previous research, where several studies (Wang et al., 2020; Syrek et al., 2021; Kumar et al., 2021) have reported that households with children have faced major challenges related to WFB while teleworking during the pandemic. Some of the consequences this employee group have faced are e.g., lower levels of job satisfaction, more disruptions and role conflict. On the other hand, employees with children have also reported that increased flexibility is an important positive consequence of the pandemic, where they can organize the workday best adapted to both themselves and the children in the household (Armor et al., 2020). In this study, 43% of the sample reported living with children in their household, and where 57% did not have children in their household (see table F-1). This result proves to be negatively significant for a large part of the sample, something that may be interesting for the external company in this thesis to take a closer look at to improve the situations for the employees with households with children.

Overall, the results from the independent variables in the regression analysis show that young employees with households with children have a lower WFB. This result is something that has also been discussed in other studies (Carnevale & Hatak, 2020; Raišienė et al., 2021b), where employees in the “establishment life stage” may encounter new challenges related to separating work and family domains. During the pandemic, this may have been extra challenging for some employees, where they no longer had a clear distinction between work and family, as before the pandemic. This phase of life can be understood as challenging related to new roles such as parent, new employee etc. This can also be seen in light of “role theory” which claims that people have difficulty maintaining multiple roles, and can never fulfil all roles equally. This can further lead to inter-role conflict, where the individual experiences a feeling of not fulfilling any of the desired roles (Kumar et al., 2021). This can e.g., be seen in the regression analysis, where perhaps difficulties in maintaining both roles at a young age can weaken their WFB.

5.2 Research question 2

Research question number two in this thesis can be understood as more exploratory, to see what probabilities there are for everyday work life after the pandemic, as it's still a debatable topic. To take a closer look at this research question, three variables have been selected, which is 1. ideal work week after the pandemic 2. ability to separate work and family in a good way and 3. ability to return to the physical workplace with minimal disturbances in routines/personal life.

Before the pandemic, teleworking was seen as voluntarily and not mandatory, and where WFB was a highly focused area within Norwegian family policy. Today family constellations are no longer based on “the nuclear family”, and more double-working couples and more single parents are prominent. On the other hand, these societal changes can contribute to

positive ripple effects such as increased income, but also challenges such as increased role conflict and stress (Carnevale & Hatak, 2020; Meyer et al., 2021). Major changes, like the pandemic, require an ability for problem solving and finding motivation in struggling times, but this adjustment process can often be understood as a time-consuming learning process (Kaufmann & Kaufmann, 2015). In contrast, the pandemic introduced an overnight restructuring process that affected several levels of society. This can be perceived as difficult for several employees since they had to telework by themselves, alongside with society shutting down kindergartens/schools, leisure activities and other events. This change created concerns about how to facilitate employees' WFB in a healthy way, also during the pandemic.

The new isolating everyday life during the pandemic, also created frustrations related to the restrictions' duration, since no one knew how long the pandemic would last. This uncertainty can also be experienced as challenging, where one must adjust to a completely new everyday life, but without knowledge on how long to continue to adjust. Now that we are in May 2022, most Norwegian employees have once again returned to their physical workplaces, the children are back at physical education at school and young children can once again attend kindergarten. After two years of experience with telework, and its impact on work and family, many have now wondered about the same question: what is the ideal work week after the pandemic?

In this study, respondents were asked exactly this question. The descriptive statistics (see Table F-1 in the appendix) showed that 59% wanted more physical workdays than digital workdays. Furthermore, one could also see that 32% of the sample wanted to work only at their physical workplace, and 10% wanted more digital workdays than physical. No one in this sample reported that they wanted to only telework after the pandemic. These results show that most employees want to have a hybrid workweek, by combining physical and digital attendance at work. Furthermore, the chi-square test showed that gender and the presence of children does not have a significant impact on what wishes and preferences one has for one's future workweek. On the other hand, age was shown to have a significant difference between the age groups. Most employees aged 18-35, closely followed by employees aged 55-65+ years, wanted to work hybrid, with most physical workdays, and most employees aged 36-55 wanted to work hybrid with most digital workdays. Further, these results are consistent with previous research, where more employees want to take advantage of teleworking a few days a week (Tomei, 2021). Co-determination in the work structure is also something that embraces the concept of autonomy, where this through the regression analysis proved to have an impact on employees' WFB during the pandemic. Experiencing that one has freedom in the work domain can also make the organization of the family domain easier (Brunelle & Fortin, 2021). The result of an increased desire for hybrid solutions is also something that corresponds with the increasing degree of telework before the pandemic, where the pandemic can be seen as an expanding starting point for the use of telework in Norway.

The sample in this thesis was also asked if they thought they were able to separate work and family in a good way (see table F-1), where 40% answered that they agreed, 24% were neutral and 35% disagreed. This result can be seen as interesting in that the sample is divided on this issue. Therefore, group differences were also looked at through a chi-square test, where gender differences proved to be significant. Here one could see that more women both disagreed and agreed more than men, in that they managed to separate work and family in a good way. This shows that the proportion of women were divided on this question. Other studies (Carnevale & Hatak, 2020; Tomei, 2021) have also shown that

women experience more disruption and negative consequences by teleworking, than men. But regardless studies shows that women still report a desire to use telework. This can be seen as a possible reason why women are also divided in this area. However, in the regression analysis, the variable gender showed not to be of particular importance for perceived WFB in this thesis. Furthermore, more men also disagreed than agreed on this question, where this can be seen in the light of the study by Raišienė et al. (2021b), where younger men report challenges with self-organization in contrast to women. Another reason may be the traditional gender roles, where women are more often more responsible for the family, and where they have more experience in juggling work and family, than men.

Next, respondents were asked if they were able to return to their physical workplace with minimal disruption to their routines/personal lives. In the descriptive statistics (see table F-1 in the appendix) 81% answered that they agreed, 16% were neutral and 3% answered that they disagreed. Furthermore, in the chi-square test there was a significant difference between families with and without children. Both groups had the highest percentage who answered that they agreed that they were able to return to work with minimal disruption, but where families without children had the highest percentage (92%). Furthermore, families with children had the highest percentage of neutral respondents (21%), where a possible reason may be that there are several uncertainties as to whether they are able to return without disturbances, this e.g., if the children continue with home-schooling longer than the restriction for teleworking. Such factors must be considered individually, where some may choose to be neutral since they cannot decide how the restrictions will degenerate. Furthermore, it can also be seen that families with children also had the most dissenting respondents (6%), in contrast to families without children where no one disagreed in this question. This may also be due to uncertainty about the duration of the restrictions, or if they had created new routines that could be difficult to implement in the physical workplace (e.g., longer breaks or starting work earlier/later in the day). But it must be noted that this percentage is very low seen as a whole. Furthermore, gender differences and age differences were shown not to be significantly related to this question.

Based on the results from these three individual variables, most employees want the opportunity to work both digitally and in their physical workplace, in their future workweek. But one can also see that the employees are divided on whether they feel they can separate work and family in a good way. But on the other hand, most of the employees answer that they can return to their workplace with minimal disruption in their personal lives. Overall, the desire to work more digitally is present, but also characterized by some uncertainty about their own abilities to maintain a healthy WFB.

5.2.1 Different motivational factors

There can be different motivational factors that affect the various choices we make in our lives (Einarsen & Skogstad, 2011). To take a closer look at the motivating factors behind the respondent's response distribution to their ideal work week after the pandemic, they were also asked what factors motivated them to either continue to telework or return to their physical workplace after the pandemic. In the descriptive statistics (see table F-1 in the appendix), the respondents could tick off for nine selected alternatives based on theoretical framework, and the alternative "other". The biggest factor for working in their physical workplace after the pandemic was "more physical interaction with colleagues". The need for relatedness can be seen considering this motivational factor, where social

interaction is linked to this need (Deci & Ryan, 2000). Furthermore, this can also be linked to the lack of physical social interaction during the pandemic, where the digital interactions may not have had a satisfactory effect for several employees. This may be because digital conversations often become more formal and less dynamic and spontaneous, than conversations that e.g., occurs during the coffee break in the physical workplace. Furthermore, motivational factors such as “easier to collaborate/more teamwork” and “use hardware/equipment I am used to” are also prominent for continuing to work in their physical workplace. Easier collaboration can also be linked to the social interactions received digitally vs. physical. Furthermore, one can interpret the use of software one is familiar with as an advantage for being productive in one’s work tasks.

The motivating factor that had the largest response rate for continuing with teleworking after the pandemic, was “more flexibility”. This factor is also consistent with previous research (Syrek et al., 2021; Novaes et al., 2018; Brunelle & Fortin, 2021) where flexibility has been shown to be an advantage of telework, and has a positive effect on WFB. Furthermore, one can see motivational factors such as “less disturbances” and “more interaction with the family”, as also important for whether one wants to continue teleworking. The factors “less disturbances” can also be seen related to previous studies, especially if you have households with children or live alone (Wang et al., 2020; Tomei, 2021). Furthermore, one can also see that teleworking offers more interaction with the family for more employees. If this is affected by the whole family having to be at home during large parts of the pandemic, or whether they get more family-time after work while teleworking is uncertain, but this can be seen as a motivating factor for the respondents.

Since the questions about the motivational factors are multiple choice, the respondents were able to tick several factors that motivate them to either return to their physical workplace or to continue with teleworking after the pandemic. Because of this, the more factors the respondents have ticked, was interpreted as a higher motivation level. Table F-1 in the appendix shows the distribution of how many motivating factors the respondents had in relation to working physically or digitally. Twice as many respondents had more motivational factors when it came to factors for working in their physical workplace, than continuing with teleworking. A possible reason for this may be because several employees are simply more used to working physically, and enjoy it. On the other hand, a challenge with dividing motivation into factors with equal values, could be that some factors for some employees does not have an equal value. For example, “social interaction with colleagues” can be the biggest motivational factor for someone, and could be worth as much as all the other factors combined. But since the factors are set to have the same significance in value, this must be included in the interpretation of these results.

5.3 Future expectations

Previous research has pointed to both positive and negative aspects of teleworking during the pandemic (Wood et al., 2021; Weitzer et al., 2021). Some believe that teleworking will influence modern working life to a greater extent after the pandemic, and where some want everything to go back to the old and familiar, where working in their physical workplace was the norm (Aczel et al., 2020).

Interaction with colleagues during breaks, open office landscapes and physical meetings, were replaced by home offices and Teams/Zoom meetings. Through the pandemic, some have felt more motivation and innovation, while some have struggled to balance the new compelling and isolating everyday life. Wood et al. (2021) conducted a diary study with employees at two universities in England, where the goal was to look at well-being and teleworking during the pandemic. Two surveys were conducted, one in May 2020 and one in September 2020. In this study, it was found that psychological detachment, loneliness and job insecurity were prominent in both periods. In addition, employees experienced lower well-being, due to an increase in loneliness and a lower ability to detach from work. This study confirms the disadvantages of teleworking. But although the pandemic's restrictions have not been the most pleasant for many, it has nevertheless helped create positive changes. A study from Austria found that employees who teleworked were more efficient and had higher job performance, more spare time, flexibility and control over their own everyday lives. Increased flexibility and co-determination in work, was also linked to higher job satisfaction and improved well-being (Weitzer et al., 2021).

Regardless of this, teleworking has been a central part of lockdown in many countries, and is a growing phenomenon in the organizations research field. We still have not seen the full long-term effect of the various restrictions regarding teleworking, and how this has affected different employees. But the big question still remains how to optimize telework for both employees and employers in the future.

6 Conclusion

First, in this concluding chapter, the thesis main findings will be presented through the thesis two research questions. This is to answer the main research question: *What connections are there between work-family balance, autonomy, relatedness, competence and future orientation, while teleworking in a large engineering company during the Covid-19 pandemic?* Furthermore, the thesis limitations will be discussed, followed by thoughts and reflections on further research.

6.1 Summary of the study's main findings

1. *To what degree did teleworking during the Covid-19 pandemic affect employees in a large engineering company's, experience of work-family balance, autonomy, relatedness and competence?*

The results of this thesis have showed that there was a significant positive correlation between the experience of autonomy and work-family balance (WFB) while teleworking during the pandemic. Furthermore, the results showed that there was no significant relationship between the need for relatedness and competence, on the experience of WFB. Based on the thesis theoretical framework, experiencing a satisfactory degree of all three needs will help to increase an individual's intrinsic motivation, where the desire to further develop both personally and professionally increases (Deci & Ryan, 2000). Given that autonomy was the only psychological factor that had a significant effect in this sample, this study cannot fully confirm the self-determination theory (SDT), but only parts of it. Furthermore, the positive significant finding between autonomy and WFB can be seen in confirming previous research (Brunelle & Fortin, 2021; Syrek et al., 2021). However, all three constructions in SDT are important for employee's motivation, where each describes a well-known phenomenon in working life, that are important for experiencing a healthy work environment. Further, these phenomena have been shown to be significant with WFB in other studies, both before and during the pandemic (Behzadnia & FatahModares, 2021; Senécal et al., 2001; Roche & Haar, 2020).

2. *Has teleworking during the Covid-19 pandemic affected what employees of a large engineering company think is best for themselves and their colleagues after the pandemic?*

The results from this thesis show that as many as 69% of this sample want a future workweek to include the opportunity to telework. This result also proves to be consistent with previous research, where many researchers predict an increased digitalised everyday work life through teleworking (Tomei, 2021). Surprisingly, one can also see that there is a higher response rate on the motivational factors for returning to their physical workplace after the pandemic, where physical interaction with colleagues still plays a major role. On the other hand, the motivating factor "more flexibility" has the greatest response distribution when it comes to continuing with teleworking. Furthermore, one can also see an age difference in the distribution of hybrid solution preferences, where most employees aged 18-35, closely followed by employees aged 55-65+ years, wanted to work hybrid, with most physical workdays, and where most employees aged 36-55 wanted to work hybrid with more digital workdays.

Furthermore, one can also see that the sample is divided when it comes to their own subjective assessment of whether they can separate work and family in a good way. Here 40% agree, 24% were neutral and 35% disagree. In addition, one could see gender differences in this subjective assessment, where more women both agreed and disagreed more than men, in other words the women were divided on this question. This can be seen considering previous studies where gender differences are present, especially for women (Carnevale & Hatak, 2020; Tomei, 2021). Furthermore, a more unanimous result was found, when it came to the respondents' subjective assessment of their ability to return to their physical workplace with minimal disruption to their routines/personal lives. Here 81% answered that they agreed, 16% were neutral and 3% disagreed on this question. Furthermore, one could also see differences between households with and without children, where families with children had the highest neutral respondents, and where households without children had a larger proportion of agreed respondents, vs. families with children. In this thesis the results show that there are group differences in age, gender and between households with/without children, within the three independent variables.

6.2 Limitations of the study

Every study has its limitations, where this study is no exception. A main limitation that characterizes this study is the sample size, where it would have been desirable to have more respondents. A small sample size has different weaknesses in quantitative research, such as problems with generalizability, where a small sample may be at risk of not representing the population. Other problems are that the individual observations weigh more in statistical analyses with small samples. Furthermore, small samples can set limits for which statistical analyses that can be carried out, which is applicable in this thesis where the sample is in the lower limit to e.g., run factor analysis. This is a limitation that was also considered, where the focus was on not running too complex of analyses.

When it comes to the actual survey set-up, questions can be asked about the use of the number of items and my own translation of one scale (WDQ) into Norwegian. One can see that several items were taken away in the creation of various dependent variables (WFB, autonomy, relatedness and competence), where this affected the dimensionality of the different variables, by measuring selected sides of a phenomenon instead of the phenomenon as a whole. The reason for extracting the various items was because they either split into several dimensions (they did not specifically explain what was meant to be measured) or had a low Cronbach's alpha value (below 0.30). By removing these items, the latent variables became stronger, but this was also at the expense of the length of the survey. The survey could have contained fewer items and been faster to complete for the respondents. But on the other hand, one can also see that the respondents who have chosen to participate, have answered on almost the entire survey as there is very low missing data for this thesis. When it comes to translations, one can always ask questions of one's own subjective assessments when it comes to the translation process of a scale, but to ensure that the translations were not ambiguous, a pilot study was conducted.

Another limitation that can be seen in this thesis is the actual timing of the deployment of the survey. This because the survey asked questions that could have been answered differently if the survey had been sent out at the beginning of the pandemic. This could have made the respondents answer differently, when they at the time did not have had sufficient experience of balancing work and family while teleworking. On the other hand, it has been beneficial to deploy the survey more towards the end of the pandemic. Since

employees then had built up new work routines that they also may want to use after the end of the pandemic.

When interpreting the results in this study, it will be important to mention the effect size. Several of the effect sizes in this thesis are small (between 0.2 and 0.5), where this can increase the risk of type-2 errors. Type-2 errors occur when we fail to reject a null hypothesis when it's actually false (Pallant, 2013). Furthermore, since this thesis is based on a cross-sectional design, the method cannot say anything about the phenomenon's development over time (Ringdal, 2018). This can be perceived as a limitation, where e.g., a longitudinal design follows development over time, but due to this thesis time constraint, a cross-sectional design was preferred. Further, the sample was selected through a convenience sample, where this could affect the external validity, and weaken the generalizability and risk of overrepresentation in some groups (Ringdal, 2018). Because of this, one can also not say anything about the causality of the results for sure, but rather interpret what indications that could be possible.

6.3 Further research

Research done within this subject area is still in demand (Bakkeli, 2021). It's still uncertain what the future workweek will look like, thus it's still important to continue to investigate which connections can affect employees in different situations. The Covid-19 pandemic will probably not be the last pandemic, and major societal changes can still occur such as climate change, economic downturns, political instability and war (Carnevale & Hatak, 2020). Because of this, we do not know for sure what a "normal" workweek will look like in the future.

Due to the presented limitations this thesis can be considered as exploratory, where further research in this area will be important to conduct, to understand how different individuals have managed to balance work and family during a challenging time period. Therefore, it will be an advantage for further research to find a higher predictive variance in their statistical analyses, to create a more comprehensive picture of which factors that might impact employees' experience of WFB during the pandemic. The same applies to achieving a satisfactory sample size, to ensure generalized and valid results. Since this study is based on a cross-sectional study, it can't say anything about causal relationships, where longitudinal studies will be recommended to investigate future unexpected situations that may arise. In addition to this, studies that use a qualitative research method can also be beneficial within this subject area.

Due to the scope of the thesis, several possible areas of interest were excluded. Therefore, it may be of interest for future research to take a closer look at how different professionals and industries have experienced teleworking during the pandemic, and whether this has affected their WFB. Furthermore, it may be of interest to take a closer look at any gender differences, both in different age groups and occupations. In addition, personality differences may be of interest, where differences between both employees and leaders can be meaningful to further explore. Already now we can see that more Norwegian employees want to be an active employee even after their retirement age (SSB, 2020). Research in this area can be a contributor to exploring how a more digital workweek also can be in the future. This is to create a meaningful working life as early as possible, in what can be a long active career life.

7 References

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Appendix A: Scales and items

Table A-1. *Work-family balance: scales from "the Knowledge Intensive Working Environment survey target 2.0" (KIWEST 2.0)*

<p>WFF (4 items)</p> <ul style="list-style-type: none"> • <i>"The things I do at work help me deal with personal and practical issues at home"</i> • <i>"The things I do at work make me a more interesting person at home"</i> • <i>"Having a good day at work makes me a better companion when I get home"</i> • <i>"The skills I use at work are useful for things I have to do at home"</i>
<p>WFC (4 items)</p> <ul style="list-style-type: none"> • <i>"My job reduces the effort I can give to activities at home" ®</i> • <i>"Stress at work makes me irritable at home" ®</i> • <i>"My job makes me feel too tired to do the things that need attention at home" ®</i> • <i>"Job worries or problems distract me when I am at home" ®</i>

® = Reversed item

Table A-2. *Autonomy: scales from "the General Nordic questionnaire for psychological and social factors at work" (QPS Nordic)*

<p>Positive challenges at work (3 items)</p> <ul style="list-style-type: none"> • <i>"Are your skills and knowledge useful in your work?"</i> • <i>"Is your work challenging in a positive way?"</i> • <i>"Do you consider your work meaningful?"</i>
<p>Control over decisions (5 items)</p> <ul style="list-style-type: none"> • <i>"If there are alternative methods for doing your work, can you choose which method to use?"</i> • <i>"Can you influence the amount of work assigned to you?"</i> • <i>"Can you influence decisions concerning the persons you will need to collaborate with?"</i> • <i>"Can you decide when to be in contact with clients?"</i> • <i>"Can you influence decisions that are important for your work?"</i>
<p>Control over work intensity (4 items)</p> <ul style="list-style-type: none"> • <i>"Can you set your own work pace?"</i> • <i>"Can you decide yourself when you are going to take a break?"</i> • <i>"Can you decide the length of your break?"</i> • <i>"Can you set your own working hours (flexitime)?"</i>

Table A-3. *Relatedness: scales from "the Knowledge Intensive Working Environment survey target 2.0" (KIWEST 2.0)*

<p>Cohesion in work teams (3 items)</p> <ul style="list-style-type: none"> • <i>"At our unit we stand together in trying to reach our performance goals"</i> • <i>"I'm happy with my unit's level of task commitment"</i> • <i>"This unit gives me ample opportunities to improve my personal performance"</i>

<p>Social community at work (3 items)</p> <ul style="list-style-type: none"> • <i>"There is a good atmosphere between me and my colleagues"</i> • <i>"There is a good sense of fellowship between the colleagues at my unit"</i> • <i>"I feel that I am a part of a community at my unit"</i>
<p>Inclusiveness and social responsibility (4 items)</p> <ul style="list-style-type: none"> • <i>"Men and women are treated as equals in my unit"</i> • <i>"In my unit, there is room for employees of a different ethnic background or religion"</i> • <i>"In my unit, there is room for older employees"</i> • <i>"In my unit, there is room for employees with various illnesses or disabilities"</i>
<p>Social climate (5 items)</p> <ul style="list-style-type: none"> • <i>"The climate in my unit is competitive"</i> • <i>"The climate in my unit is encouraging and supportive"</i> • <i>"The climate in my unit is distrustful and suspicious" ®</i> • <i>"The climate in my unit is relaxed and comfortable"</i> • <i>"The climate in my unit is rigid and rule-based"</i>

® = Reversed item

Table A-4. Competence: scales from "the Work Design questionnaire" (WDQ)

<p>Job complexity (4 items)</p> <ul style="list-style-type: none"> • <i>"The job requires that I only do one task or activity at a time" ®</i> • <i>"The tasks on the job are simple and uncomplicated" ®</i> • <i>"The job comprises relatively uncomplicated tasks» ®</i> • <i>"The job involves performing relatively simple tasks" ®</i>
<p>Information processing (4 items)</p> <ul style="list-style-type: none"> • <i>"The job requires me to monitor a great deal of information"</i> • <i>"The job requires that I engage in a large amount of thinking"</i> • <i>"The job requires me to keep track of more than one thing at a time"</i> • <i>"The job requires me to analyze a lot of information"</i>
<p>Problem solving (4 items)</p> <ul style="list-style-type: none"> • <i>"The job involves solving problems that have no obvious correct answer"</i> • <i>"The job requires me to be creative"</i> • <i>"The job often involves dealing with problems that I have not met before"</i> • <i>"The job requires unique ideas or solutions to problems"</i>
<p>Skill variety (4 items)</p> <ul style="list-style-type: none"> • <i>"The job requires a variety of skills"</i> • <i>"The job requires me to utilize a variety of different skills in order to complete the work"</i> • <i>"The job requires me to use a number of complex or high-level skills"</i> • <i>"The job requires the use of a number of skills"</i>
<p>Specialization (4 items)</p> <ul style="list-style-type: none"> • <i>"The job is highly specialized in terms of purpose, tasks, or activities"</i> • <i>"The tools, procedures, materials, and so forth used on this job are highly specialized in terms of purpose"</i> • <i>"The job requires very specialized knowledge and skills"</i> • <i>"The job requires a depth of knowledge and expertise"</i>

® = Reversed item

Appendix B: NSD-assessment



Vurdering

Referansenummer

676439

Prosjekttittel

Covid-19: The future of home office

Behandlingsansvarlig institusjon

Norges teknisk-naturvitenskapelige universitet / Fakultet for samfunns- og utdanningsvitenskap (SU) /
Institutt for pedagogikk og livslang læring

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Jonathan Reams, jonathan.reams@ntnu.no, tlf: 73591651

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Nora Amanda Solstad, nora.a.solstad@ntnu.no, tlf: 47359692

Prosjektperiode

01.01.2022 - 01.06.2022

Vurdering (1)**24.02.2022 - Vurdert****OM VURDERINGEN**

Personverntjenester har en avtale med institusjonen du forsker eller studerer ved. Denne avtalen innebærer at vi skal gi deg råd slik at behandlingen av personopplysninger i prosjektet ditt er lovlig etter personvernregelverket.

Personverntjenester har nå vurdert den planlagte behandlingen av personopplysninger. Vår vurdering er at behandlingen er lovlig, hvis den gjennomføres slik den er beskrevet i meldeskjemaet med dialog og vedlegg.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 01.06.2022.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres, og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER

Personverntjenester vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

Personverntjenester vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og dataportabilitet (art. 20).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER

Personverntjenester legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Nettskjema er databehandler i prosjektet. Vi legger til grunn at behandlingen oppfyller kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og eventuelt rådføre dere med behandlingsansvarlig institusjon.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til oss ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: <https://www.nsd.no/personverntjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema> Du må vente på svar fra oss før endringen gjennomføres.

OPPFØLGING AV PROSJEKTET

Personverntjenester vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Kontaktperson hos oss: Henning Levold
Lykke til med prosjektet!

Appendix C: The survey

Covid-19: The future of home office (EN)

Side 1

Welcome!

This survey has been arranged by NTNU as part of a master's project, which will be submitted in the spring of 2022.

Through this survey, NTNU want to give you the opportunity to share your experiences of working in a home office during the Covid-19 pandemic, as well as share your wishes for the use of a home office after the pandemic. Insights from this project can have significant implications on how home offices can be improved both during and after the current pandemic.

The survey will take you approx. 8 - 10 minutes to complete.

[Read our privacy policy here!](#)

1. Consent *

- Yes, I consent to having my information collected and stored



Side 2

About you

2. What gender do you identify as?

- Male
- Female
- Other

v

3. How old are you?

- 18 - 25 years
- 26 - 35 years
- 36 - 45 years
- 46 - 55 years
- 56 - 65 years
- 65 +

4. To which department do you belong?

- "Department 1"
- "Department 2"
- "Department 3"
- "Department 4"

5. How long have you been working at "external company"?

- 0 - 2 years
- 3 - 9 years
- 10 - 19 years
- 20 - 29 years
- 30 +

Side 3

You and your household

In this part of the survey you will be asked questions about your household. ***REMEMBER** to answer based on your life situation during the pandemic.


6. How many people live in your household? (Including yourself)

- 1
- 2
- 3
- 4
- 5 +

7. Are there children in your household?


- Yes
- No

7.1. How many children are in your household?

 Dette elementet vises kun dersom alternativet «Yes» er valgt i spørsmålet «7. Are there children in your household?»

- 1
- 2
- 3
- 4
- 5 +

7.2. What age group does the child/children in your household belong to?

 Dette elementet vises kun dersom alternativet «4», «3», «5 +», «2» eller «1» er valgt i spørsmålet «7.1. How many children are in your household?»

- 0 - 11 months
- 1 - 5 years
- 6 - 9 years
- 10 - 15 years
- 16 - 19 years

Side 4

You and your home office


In this part of the survey you will be asked questions regarding your home office.

***REMEMBER** to answer based on your life situation during the pandemic.

8. Have you worked in a home office before the pandemic?

- Yes
- No

8.1. How often did you work in your home office before the pandemic?

 Dette elementet vises kun dersom alternativet «Yes» er valgt i spørsmålet «8. Have you worked in a home office before the pandemic?»

- Few times a year or less
- Few times a month
- Once a week
- Several times a week
- Every day

9. How satisfied are you with your physical home office?

- Very Dissatisfied
- Dissatisfied
- Neither/nor
- Satisfied
- Very Satisfied

10. Where is your home office, in your home?

- Living room
- Kitchen
- Office
- Bedroom
- Dining room
- Other

11. Do you have access to the equipment you need to succeed at work when you work from home (e.g. PC, printer, software, etc.)

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

12. Do you share your home office with others?

- Yes
- No

13. Do you like working at home?

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

Side 5

Autonomy

In this part of the survey, you will be asked questions and statements regarding your experience of autonomy when working from home.

***REMEMBER** to answer based on your life situation during the pandemic.

14. Are your skills and knowledge useful in your work?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

15. Can you set your own work pace?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

16. If there are alternative methods for doing your work, can you choose which method to use?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

17. Can you influence decisions that are important for your work?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

18. Is your work challenging in a positive way?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

19. Can you decide yourself when you are going to take a break?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

20. Can you influence the amount of work assigned to you?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

21. Can you decide the length of your break?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

22. Do you consider your work meaningful?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

23. Can you influence decisions concerning the persons you will need to collaborate with?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

24. Can you decide when to be in contact with clients?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

25. Can you set your own working hours (flexitime)?

- Very seldom or never
- Rather seldom
- Sometimes
- Rather often
- Very often or always

Side 6

Relatedness/belonging

In this part of the survey, you will be asked questions and statements about your experience of collaboration and belonging with other colleagues, when working from home.

***REMEMBER** to answer based on your life situation during the pandemic.

26. At our unit we stand together in trying to reach our performance goals

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

27. There is a good atmosphere between me and my colleagues

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

28. Men and women are treated as equals in my unit

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

29. The climate in my unit is competitive

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

30. I'm happy with my unit's level of task commitment

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

31. There is a good sense of fellowship between the colleagues at my unit

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

32. In my unit, there is room for employees of a different ethnic background or religion

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

33. The climate in my unit is encouraging and supportive

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

34. The climate in my unit is rigid and rule-based

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

35. I feel that I am a part of a community at my unit

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

36. In my unit, there is room for older employees

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

37. The climate in my unit is distrustful and suspicious

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

38. This unit gives me ample opportunities to improve my personal performance

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

39. In my unit, there is room for employees with various illnesses or disabilities

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

40. The climate in my unit is relaxed and comfortable

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

Side 7

Competence

In this part of the survey, you will be asked questions and statements about your experience of competence development when working from home, versus in your physical workplace.

***REMEMBER** to answer based on your life situation during the pandemic.

41. The job requires that I only do one task or activity at a time

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

42. The job requires me to monitor a great deal of information

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

43. The job involves solving problems that have no obvious correct answer

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

44. The job requires a variety of skills

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

45. The job is highly specialized in terms of purpose, tasks, or activities

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

46. The tasks on the job are simple and uncomplicated

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

47. The job requires that I engage in a large amount of thinking

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

48. The job requires me to be creative

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

49. The job requires me to utilize a variety of different skills in order to complete the work

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

50. The tools, procedures, materials, and so forth used on this job are highly specialized in terms of purpose

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

51. The job comprises relatively uncomplicated tasks

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

52. The job requires me to keep track of more than one thing at a time

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

53. The job often involves dealing with problems that I have not met before

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

54. The job requires me to use a number of complex or high-level skills

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

55. The job requires very specialized knowledge and skills

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

56. The job involves performing relatively simple tasks

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

57. The job requires me to analyze a lot of information

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

58. The job requires unique ideas or solutions to problems

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

59. The job requires the use of a number of skills

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

60. The job requires a depth of knowledge and expertise

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

Side 8

Work, family and leisure

In this part of the survey, you will be asked questions and statements about your work-family balance, when working from home.

***REMEMBER** to answer based on your life situation during the pandemic.

61. The things I do at work help me deal with personal and practical issues at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

62. My job reduces the effort I can give to activities at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

63. The skills I use at work are useful for things I have to do at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

64. The things I do at work make me a more interesting person at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

65. Stress at work makes me irritable at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

66. Job worries or problems distract me when I am at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

67. Having a good day at work makes me a better companion when I get home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

68. My job makes me feel too tired to do the things that need attention at home

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

Side 9

The road ahead

In this part of the survey, you will be asked questions about your future workday related to working from home.

***REMEMBER** to answer based on your life situation during the pandemic.

69. What would your ideal work week look like after the pandemic?

- 1 day at your physical workplace and 4 days at your home office
- 2 days at your physical workplace and 3 days at your home office
- 3 days at your physical workplace and 2 days at your home office
- 4 days at your physical workplace and 1 day at your home office
- 5 days at your physical workplace
- 5 days at your home office

70. How comfortable are you with returning to your physical workplace, after the pandemic?

- Very uncomfortable
- Somewhat uncomfortable
- Neither/nor
- Somewhat comfortable
- Very comfortable

71. Are you able to make an effective transition back to your physical workplace, after the pandemic?

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

72. How comfortable are you with collaborating with some colleagues virtually and others physically, at the same time?

- Very uncomfortable
- Somewhat uncomfortable
- Neither/nor
- Somewhat comfortable
- Very comfortable

73. Are you able to return to your physical workplace with minimal disruption to your normal routines/personal life?

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

74. Are you able to separate work and family in a good way, when working from home?

- Strongly disagree
- Disagree
- Neither/nor
- Agree
- Strongly agree

75. How productive do you feel when you work at home, compared to working in your physical workplace?

- Much less productive
- Slightly less productive
- Similarly productive
- Slightly more productive
- Much more productive

76. How productive do you feel when you work at your physical workplace, compared to working at your home office?

- Much less productive
- Slightly less productive
- Similarly productive
- Slightly more productive
- Much more productive

77. What motivates you most about returning to your physical workplace, after the pandemic?

- More face-to-face interaction with colleagues
- Use hardware/equipment that I am used to
- More flexibility
- Easier to collaborate/ more teamworking
- More control over work tasks
- More creativity
- More competent development
- Getting more feedback on my work
- Less disturbances
- Other

78. What motivates you most by continuing to work in your home office after the pandemic?

- More interaction with family
- Use hardware/equipment that I am used to
- More flexibility
- Easier to collaborate/ more teamworking
- More control over work tasks
- More creativity
- More competent development
- Getting more feedback on my work
- Less disturbances
- Other

79. On a scale of 1 to 10, how satisfied are you with your experience of working from home, during the pandemic?

Very dissatisfied

Very satisfied



Value

Side 10

Thank you for your contribution!

Press "Send" to register your answer

Appendix D: Information letter

Covid-19: The future of home office - Privacy Policy

The purpose of the project

In the spring of 2022 the project «Covid-19: The future of home office», will be implemented by NTNU. The purpose of this survey is about how you as an employee have experienced working in a home office during the ongoing pandemic, as well as exploring what wishes you have for your everyday work after the pandemic. In this letter, we give you information about the purpose of the project and what participation will mean for you. NTNU is responsible for the project, where the survey forms the basis for a master's thesis.

Your answer is very useful for mapping and understanding various factors that influence employees' experience of home office. The results of this survey will be used by "external company" to help them understand how to improve working conditions.

Why are you asked to participate?

- You have been selected as a participant for this survey, through a collaboration between NTNU and "external company". In consultation with "external company", you have been selected to participate in this project.
- The criteria for participating is that you are over 18 years old and have experience from working in a home office during the pandemic.
- The survey is sent internally through "external company", on behalf of NTNU, to prevent the exchange of contact information.

What does it mean for you to participate?

- If you choose to participate in this project, it means that you fill out a survey, which will take you approx. 8 - 10 minutes.
- The survey mainly contains questions about your psychosocial work environment, as well as factors that may be contributors to the experience of working at home.
- Your answers from the survey will be registered electronically.

It is voluntary to participate

- It is voluntary to participate in the project. If you choose to participate, you can withdraw your consent at any time without giving any reason.
- If you wish to withdraw from participating in this survey, you have the option to go back to the consent page and change your response. Then your answers to other survey questions will be deleted.
- You will not experience any negative consequences if you don't want to participate or later choose to withdraw. Similarly, not participating or withdrawing your consent will not affect your relationship with your workplace/employer.

Your privacy - how we store and use your information

- We will only use the information about you for the purposes we have described in this letter. We treat the information confidentially and in accordance with the privacy regulations. The persons responsible for processing the personal data through NTNU, are master's student Nora Amanda Solstad, main supervisor Jonathan Reams and co-supervisor Vegard Johansen.

- To secure access to the information you provide, the data material is stored on secure servers and encrypted when being transferred for any subsequent analysis.
- The survey will be processed by the supplier "Nettskjema", where NTNU has a data processor agreement with UiO. Your employer will only have access to the results of the survey and not data that is neither direct nor indirectly identifying.
- While your responses are anonymous in that we are not collecting names, emails, or IP addresses, we recognize that it might be possible for "external company" or colleagues to identify someone from the specifics of the demographic details. No participants will be recognized in the publication of the final master's thesis.
- We process information about you based on your consent. On behalf of NTNU, NSD - Norwegian Center for Research Data AS has assessed that the processing of personal information in this project is in accordance with the privacy regulations.

Your rights

If you can be identified in the data material, you have the right to:

- To gain insight into what information we process about you, and to receive a copy of the information
- To correct information about you that is incorrect or misleading
- To have personal information about you deleted
- To send a complaint to the Norwegian Data Protection Authority about the processing of your personal data

If information about you for the project is provided by anyone other than yourself, you will also have the right to protest the processing of the information.

What happens to your information when the research project ends?

According to the plan, the project will be completed by June 2022. When the project ends, only anonymous and aggregated data will be stored at "external company" for later research, where the data will be stored indefinitely.

If you have any questions, please contact:

If you have questions about the project, or want to use your rights, contact:

- NTNU at Nora Amanda Solstad (nora.a.solstad@ntnu.no), or Jonathan Reams (jonathan.reams.ntnu.no).
- Our data protection officer: Thomas Helgesen (thomas.helgesen@ntnu.no)

If you have questions related to NSD's assessment of the project, you can contact:

- NSD - Norwegian Center for Research Data AS by mail (personverntjenester@nsd.no), or by phone: 55 58 21 17.



Appendix E: Principal component analysis (PCA) and reliability tests (α)

Table E-1

Principal component analysis with oblique rotation (direct oblimin)

Items	Autonomy	Relatedness	Competence
Can you decide the length of your break?	0.87		
Can you decide yourself when you are going to take a break?	0.79		
Can you set your own working hours (flexitime)?	0.72		
Can you set your own work pace?	0.66		
In my unit, there is room for employees of a different ethnic background or religion		-0.88	
In my unit, there is room for employees with various illnesses or disabilities		-0.77	
In my unit, there is room for older employees		-0.74	
Men and women are treated as equals in my unit		-0.68	
The job comprises relatively uncomplicated tasks			0.86
The job involves performing relatively simple tasks			0.86
The tasks on the job are simple and uncomplicated			0.79
Eigenvalues	2.98	2.39	1.82
% of variance	27.08	21.73	16.52
Cronbachs alpha	0.77	0.78	0.79

Note. n = 116. Coefficients under 0.3 are suppressed.

Appendix F: Descriptive statistics for different independent/control variables

Table F-1

Response distribution between different independent variables/control variables

Independent variable/ control variable	Group		Total
	n	%	n
Gender			
Man	73	63	116
Woman	43	37	
Age			
Low age (18 - 35 years)	38	33	116
Medium age (36 - 55 years)	61	53	
High seniority (10 - 30+ years)	17	15	
Seniority			
Low seniority (0 - 2 years)	30	26	116
Medium seniority (3 - 9 years)	55	48	
High seniority (10 - 30+ years)	31	27	
Household			
Single (1 person)	12	10	116
Couple (2 persons)	38	33	
Children			
With children	66	43	116
Without children	50	57	
Ideal workweek after the pandemic			
More digital workdays, than physical	11	10	116
More physical workdays, than digital	68	59	
Only physical workdays	37	32	
Motivational factors to work at the physical workplace			
More physical interaction with colleagues	105	32	311
Use hardware/equipment I am used to	41	13	
More flexibility	4	1	
Easier to collaborate/more teamwork	61	19	
More control over work tasks	18	6	
More creativity	16	5	
More competence development	25	8	
Getting more feedback on my work	21	6	
Less disturbances	20	6	
Other	18	6	
Motivational factors to work at the physical workplace – number of factors answered			
1 - 3 motivational factors	82	70	116
4 – 6 motivational factors	29	25	
7 – 9 motivational factors	3	3	

Table F-1 (continued).

Motivational factors to telework			
More physical interaction with colleagues	34	17	151
Use hardware/equipment I am used to	1	1	
More flexibility	78	38	
Easier to collaborate/more teamwork	3	2	
More control over work tasks	8	4	
More creativity	1	1	
More competence development	1	1	
Getting more feedback on my work	0	0	
Less disturbances	59	29	
Other	18	9	
Motivational factors to telework – number of factors answered			
1 - 3 motivational factors	97	84	116
4 - 6 motivational factors	4	3	
7 - 9 motivational factors	0	0	
Ability to separate work and family in a good way			
Disagrees	41	35	116
Neutral	28	24	
Agrees	46	40	
Ability to return with minimal disruption to your normal routines/personal life			
Disagrees	4	3	116
Neutral	18	16	
Agrees	94	81	

Appendix G: Correlations between items

Table G-1

Work-family balance: correlations between items

	1	2	3	4	5
1. The things I do at work help me deal with personal and practical issues at home	1	0.32**	0.25**	0.31**	0.35**
2. My job reduces the effort I can give to activities at home		1	0.36**	0.38**	0.53**
3. Stress at work makes me irritable at home			1	0.69**	0.39**
4. Job worries or problems distract me when I am at home				1	0.35**
5. My job makes me feel too tired to do the things that need attention at home					1

Note. **p<0.01

Table G-2

Autonomy: correlations between items

	1	2	3	4
1. Can you decide the length of your break?	1	0.41**	0.43**	0.25**
2. Can you decide yourself when you are going to take a break?		1	0.62**	0.43**
3. Can you set your own working hours (flexitime)?			1	0.63**
4. Can you set your own work pace?				1

Note. **p<0.01

Table G-3*Relatedness: correlations between items*

	1	2	3	4
1. In my unit, there is room for employees of a different ethnic background or religion	1	0.57**	0.59**	0.53**
2. In my unit, there is room for employees with various illnesses or disabilities		1	0.42**	0.29**
3. In my unit, there is room for older employees			1	0.43**
4. Men and women are treated as equals in my unit				1

Note. **p<0.01

Table G-4*Competence: correlations between items*

	1	2	3
1. The job comprises relatively uncomplicated tasks	1	0.61**	0.53**
2. The job involves performing relatively simple tasks		1	0.55**
3. The tasks on the job are simple and uncomplicated			1

Note. **p<0.01

Appendix H: Chi-square-tests of independent variable (ideal workweek after the pandemic)

Table H-1

Chi-square-test: ideal workweek after the pandemic, by gender

Group	Gender			
	Man		Woman	
	n	%	n	%
More physical workdays, than digital	42	58	26	60
More digital workdays, than physical	4	6	7	16
Only physical workdays	27	37	10	23

Note. n = 116. $\chi^2 (2) = 4.97, p = 0.08$

Table H-2

Chi-square-test: ideal workweek after the pandemic, by households with/without children

Group	Children			
	With children		Without children	
	n	%	n	%
More physical workdays, than digital	36	55	32	64
More digital workdays, than physical	8	12	3	6
Only physical workdays	22	33	15	30

Note. n = 116. $\chi^2 (2) = 1.66, p = 0.44$

Appendix I: Chi-square-tests of independent variable (ability to separate work and family)

Table I-1

Chi-square-test: ability to separate work and family in a good way, by age groups

Group	Age					
	Low age (18-35)		Medium age (36-55)		High age (56-65+)	
	n	%	n	%	n	%
Agrees	12	32	26	43	8	47
Neutral	13	34	10	16	6	35
Disagrees	13	34	25	41	3	18

Note. n = 116. $\chi^2 (4) = 6.88, p = 0.14$

Table I-2

Chi-square-test: ability to separate work and family in a good way, by households with/without children

Group	Children			
	With children		Without children	
	n	%	n	%
Agrees	26	39	15	40
Neutral	14	21	20	30
Disagrees	26	39	15	30

Note. n = 116. $\chi^2 (2) = 1.59, p = 0.45$

Appendix J: Chi-square-tests of independent variable (ability to return to your physical workplace with minimal disruption to your normal routines/personal life)

Table J-1

Chi-square-test: ability to return to your physical workplace with minimal disruption to your normal routines/personal life, by gender

Group	Gender			
	Man		Woman	
	n	%	n	%
Agrees	62	85	32	74
Neutral	10	14	8	19
Disagrees	1	1	3	7

Note. n = 116. $G^2(2) = 3.26, p = 0.21$

Table J-2

Chi-square-test: ability to return to your physical workplace with minimal disruption to your normal routines/personal life, by age groups

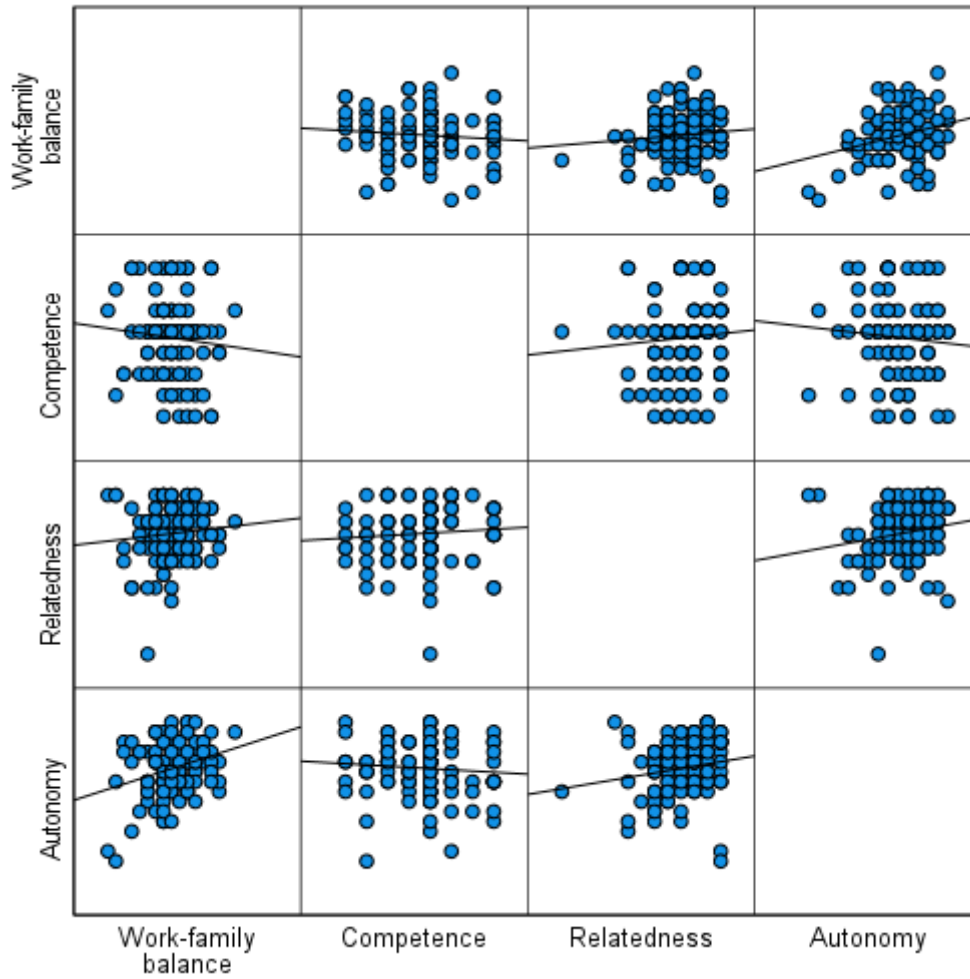
Group	Age					
	Low age (18-35)		Medium age (36-55)		High age (56-65+)	
	n	%	n	%	n	%
Agrees	30	80	47	77	17	100
Neutral	6	16	12	20	0	0
Disagrees	2	5	2	3	0	0

Note. n = 116. $G^2(4) = 8.24, p = 0.08$

Appendix K: Scatterplott for linearity

Figure K- 1

Scatterplott: WFB, autonomy, relatedness and autonomy



Appendix L: Scatterplot for homoskedasticity

Figure L-1

Scatterplot: WFB, autonomy, relatedness, autonomy, man, low age (18-35) and household with children

