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Promoting Work-Life Balance in Flexible Work

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To everyone who has believed in me
and supported me along this journey

Abstract

Background: Flexible work arrangements (FWAs), which allows employees to decide when, where, and how to perform the work, is more prevalent than ever in modern working life. However, research about how FWAs can be organized to promote work-life balance (WLB) is sparse. The overall aim of this thesis was to develop, implement, and evaluate a workplace intervention among office-based employees with FWAs. More specifically, the aims were to: 1) identify demands and resources related to WLB; 2) in co-creation with the investigated organization, identify suggestions for improvements to guide the development of a workplace intervention; and 3) implement and evaluate the effect of an intervention, addressing some of the identified suggestions on proximal (i.e., work strategies, use of work-related information and communication technology (ICT), productivity, and expectations of availability) and distal outcomes (i.e., WLB and interference between work and private life).

Methods: Paper I was a cross-sectional study based on a comprehensive questionnaire that examined occupational factors and their associations with WLB. Paper II comprised focus group interviews to collect suggestions for improvements in FWAs at an organizational, work group and individual level. Therefore, while paper I and II informed the design of the intervention, papers III and IV comprised its implementation and evaluation. Paper III examined effects on proximal outcomes and paper IV on distal outcomes.

Results: Identified resources related to employees' WLB in FWAs were boundary management, information about how to organize work, and relation-oriented leadership. Identified demands were over-commitment to work, quantitative job demands, and expectations of availability. Perceived flexibility was a resource for WLB, which interacted with several demands and buffering their negative associations with WLB. Suggestions from the focus groups related to organizational (e.g., common guidelines for FWAs), work group (e.g., clarify expectations of availability) and individual-level improvements (e.g., determine own availability), which supported the development and implementation of an intervention addressing work strategies and culture in FWAs. Participants were satisfied with the intervention and reported changes in work strategies. No intervention effects were found on other proximal or distal outcomes.

Conclusions: We identified both demands and resources related to employees' WLB in FWAs. Employees suggested intervention activities mainly focusing on changing work strategies, both as individuals and as a work group. The intervention was effective in changing work strategies, but not in improving other proximal and distal outcomes.

Key words: digitalization, job autonomy, work control, job demands, job resources, work-life balance, work-home interference, home-work interference, participatory approach, intervention

Sammanfattning

Bakgrund: Flexibelt arbete, vilket definieras som anställdas möjlighet att bestämma när, var och hur arbetet ska utföras, är vanligare än någonsin i dagens arbetsliv. Forskning om hur flexibelt arbete kan utformas för att främja balans mellan arbete och privatliv är sparsam. Syftet med avhandlingen var att utveckla, implementera och utvärdera en arbetsplatsintervention bland kontorsanställda med flexibelt arbete. I synnerhet var avhandlingens syfte att: 1) identifiera krav och resurser relaterade till balans; 2) att i samskapande med organisationen identifiera förslag på förbättringar som önskas implementeras i en arbetsplatsintervention; och 3) implementera och utvärdera effekten av en intervention som antar några av förslagen, på proximala (dvs. arbetsstrategier, arbetsrelaterad användning av informations- och kommunikationsteknologi, produktivitet och förväntningar på tillgänglighet), och distala utfall (dvs. balans mellan arbete och privatliv och konflikt mellan arbete och privatliv).

Metod: Studie I var en tvärsnittsstudie baserad på ett omfattande frågeformulär som undersökte sambanden mellan arbetsrelaterade faktorer och balans mellan arbete och privatliv i flexibelt arbete. Studie II bestod av fokusgruppsintervjuer för att kartlägga förslag på förbättringar på organisations-, arbetsgrupp-, och individnivå. Studie I och II låg således till grund för utformningen av interventionen, medan studie III och IV bestod av implementering och utvärdering av interventionen. Studie III undersökte effekterna på proximala utfall och studie IV på distala utfall.

Resultat: Resurser för balans mellan arbete och privatliv var gränshantering, information om hur arbetet kan organiseras och ett relations inriktat ledarskap. Krav för balans var överengagemang i arbetet, arbetskrav och förväntningar om tillgänglighet. Förslag från intervjuerna berörde organisationen (t.ex. gemensamma riktlinjer för flexibelt arbete), gruppen (t.ex. klargöra förväntningar om tillgänglighet) och individen (t.ex. klargöra den egna tillgängligheten), vilket låg till grund för att utforma och genomföra en intervention för att förändra arbetsstrategier och kulturen i flexibelt arbete. Deltagarna var nöjda med interventionen och rapporterade förändrade arbetsstrategier. Inga interventionseffekter hittades för andra proximala eller distala utfall.

Konklusion: Vi fann både positiva och negativa faktorer för balans mellan arbete och privatliv i flexibelt arbete. Anställda föreslog interventionsaktiviteter för att förändra arbetsstrategier, både individuellt och inom arbetsgruppen. Interventionen var effektiv för att ändra arbetsstrategier, men inte för att förbättra andra proximala eller distala utfall.

Nyckelord: digitalisering, arbetsautonomi, arbetskontroll, arbetskrav, arbetsresurser, balans mellan arbete och privatliv, arbetet inkräktar på privatlivet, privatlivet inkräktar på arbetet, deltagande tillvägagångssätt, intervention

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List of Papers

This thesis is based on the following papers, which are referred to in the text by Roman numerals.

Paper I
Bjärntoft, S., Hallman, D.M., Mathiassen, S.E., Larsson, J., & Jahncke, H. (2020). Occupational and Individual Determinants of Work-life Balance among Office Workers with Flexible Work Arrangements. *International Journal of Environmental Research and Public Health,* 17(4):1418. doi:10.3390/ijerph17041418

Paper II
Bjärntoft, S., Hallman, D.M., Zetterberg, C., Larsson, J., Edvinsson, J., & Jahncke, H. (2021). A Participatory Approach to Identify Key Areas for Sustainable Work Environment and Health in Employees with Flexible Work Arrangements. *Sustainability,* 13(24):13593. doi.org/10.3390/su132413593

Paper III
Bjärntoft, S., Mathiassen, S.E., Brulin, E., Rudolfsson, T., & Hallman, D.M. (2023). Effects of a participative workplace intervention intended to change work strategies and expectations of availability among office-based employees with flexible work arrangements. Conditionally accepted for publication in *IISE Transactions on Occupational Ergonomics and Human Factors*

Paper IV
Pagard, S., Edvinsson, J., Brulin, E., Mathiassen S.E., & Hallman, D.M. Work-life Balance: Effects of a Participative Workplace Intervention among Office-based Employees with Flexible Work Arrangements. Manuscript in preparation

Author contributions

Paper I: This paper was designed by Sofie Bjärntoft (SB), David M Hallman (DMH), Svend Erik Mathiassen (SEM), Johan Larsson (JL) and Helena Jahncke (HJ). SB collected the data and performed data processing and analyzes, supported by DMH. SB wrote the original draft of the manuscript, which was reviewed, revised, and approved by all authors.

Paper II: This paper was designed by Sofie Bjärntoft (SB), David M Hallman (DMH), Camilla Zetterberg (CZ), Johan Larsson (JL), Johanna Edvinsson (JE) and Helena Jahncke (HJ). SB, CZ, JL, JE and HJ collected the data. SB performed data processing, and all authors were involved in the analyzes. SB wrote the original draft of the manuscript, which was reviewed, revised, and approved by all authors.

Paper III: This paper was designed by Sofie Bjärntoft (SB), Svend Erik Mathiassen (SEM), Emma Brulin (EB), Thomas Rudolfsson (TR) and David M Hallman (DMH). Data were collected by SB, and processed and analyzed by SB, supported by TR and DMH. SB wrote the original draft of the manuscript, which was reviewed, revised, and approved by all authors.

Paper IV: This paper was designed by Sophie Pagard (SP), Johanna Edvinsson (JE), Emma Brulin (EB), Svend Erik Mathiassen (SEM) and David M Hallman (DMH). Data were collected by SP and JE and processed and analyzed by SP. SP wrote the original draft of the manuscript, which was reviewed, revised, and approved by all authors.

Abbreviations

AIC	Akaike's information criterion
ANOVA	Analysis of variance
AR1	First-order autoregressive
CA	Cronbach's alpha
CI	Confidence interval
COPSOQ	Copenhagen psychosocial questionnaire
FWAs	Flexible work arrangements
HR	Human resources
HWI	Home-work interference
ICT	Information and communication technology
JD-R model	Job demands-resources model
LMM	Linear mixed model
MAR	Missing at random
MLR	Multiple linear regression
OGI level	Organizational, group and individual level
PCA	Principal component analysis
PE	Participatory ergonomics
PMA	Psychosocial management approach
-2RLL	Negative 2-residual log-likelihood
SD	Standard deviation
SE	Standard error
STA	Swedish transport administration
TBWT	Trust-based working time
WHI	Work-home interference
WLB	Work-life balance

Table of Contents

Introduction 1

Background 2
- Flexible Work – Concept and Definitions 2
- Trends in Flexible Work 4
- Work-Life Balance 5
  - The Influence of Job-Demands and Resources for Work-Life Balance in Flexible Work 6
  - Changes in Work Strategies to Improve Work-Life Balance 8
- Occupational Health Interventions in Flexible Work 9
  - Development of Organizational Interventions 10
  - Implementation Strategies 11
  - Evaluation of Organizational Interventions 12

Theoretical Framework 14

Rationale for the Thesis 15

Overall and Specific Aims 16
- Paper I 16
- Paper II 16
- Paper III 16
- Paper IV 16

Methods 17
- Organizational Context 17
- Project Organization 17
- Research Project 18
- Overview of the Included Papers 19
- Design 21
  - Paper I 21
  - Paper II 21
  - Papers III and IV 21
- Sample 22
  - Paper I 22
  - Paper II 22
  - Papers III and IV 23
- Data Collection and Measurements 23

Paper I 23
Paper II 25
Paper III and IV 25
Data Analysis 27
Paper I 27
Paper II 27
Papers III and IV 28

Ethical Considerations 29

Results 30
Development of the Intervention 30
Paper I 30
Paper II 32
Implementation and Evaluation of the Intervention 35
Paper III 35
Paper IV 36

Discussion 37
Defining the Concepts 37
Development of the Intervention 38
Implementation Strategies 41
Evaluation of the Intervention 42
Methodological Considerations 45
Research Designs 45
Population 46
Measurements 47
Data Analysis 49
Conclusions and Future Research 50
Practical Implications 52

References 53

Introduction

The Swedish Transport Administration noted a marked increase in work-related sick leave after introducing flexible work arrangements (FWAs) (i.e., flextime and non-regulated working hours). Thus, the organization requested a research project to preserve the advantages and reduce potential disadvantages of FWAs. Researchers from the University of Gävle and the top management of the organization co-created a research project entitled "Flexible work: Health-promoting Interventions for Sustainable Digitalized work". The overall goal with the research project was to develop, implement, and evaluate a workplace intervention to reduce work-related stress and sick leave, and to improve recovery and work-life balance (WLB). The project lasted from 2016 to 2020 and comprised three phases: 1) a questionnaire to identify demands and resources in FWAs; 2) focus group interviews to collect suggestions for improvements in FWAs; and 3) implementation and evaluation of a workplace intervention. The included papers in this thesis followed the three phases in the research project, with a focus on promoting WLB in FWAs.

Background

Flexible work arrangements (FWAs), defined as employee autonomy to decide when, where, and how to perform the work, are more prevalent than ever in modern working life (1,2,3). Flexible work arrangements are generally a desirable work form that can facilitate the combination of work and private life and promote a good work-life balance (WLB) (4). However, the possibility to be connected to work anywhere and at any time can cause an "always-on" culture within the work group, with high expectations of availability (5). This can lead to employees feeling compelled to respond to work-related emails and phone calls after regular working hours, which can make it difficult to detach from work during leisure time and can in turn lead to poor WLB (5,6). Hence, FWA is double-edged, and there is a considerable need for knowledge about what efforts can be made to promote a good WLB. This thesis aims to address this knowledge gap by 1) identifying demands and resources related to WLB; 2) identifying suggestions for improvements for implementation in a workplace intervention; and 3) implementing and evaluating the effects of an intervention based on some of the identified suggestions.

Flexible Work – Concept and Definitions

Flexible work arrangements are a complex concept that can be defined in many ways (3,7). In this thesis, an FWA is defined as an arrangement that allows employees, to a varying extent, decide when (in terms of how working hours are allocated), where (in terms of where the work is performed) and how to perform the work (in terms of which work tasks should be performed and in what order and way) (3). This description of FWAs is inspired by Hill et al.'s definition of workplace flexibility, which refers to "the ability of workers to make choices influencing when, where, and for how long they engage in work-related tasks" (3, p. 152). However, the definition by Hill et al., only captures two aspects of FWAs, namely, when and where the work is performed. Therefore, we reformulated their dimension of how long employees are engaged in work-related tasks (i.e., flexibility in when the work is performed) to how to perform the work (i.e., flexibility in which work tasks should be performed and in what way). Our definition of FWAs was thereafter enriched by a further dimension of flexibility, in addition to the dimensions mentioned in Hill et al.'s definition (3).

In general, FWA refers to a formal or informal agreement between the employer and the employee, which can include a wide range of arrangements (8,9). Two examples of FWAs are flextime and non-regulated working hours. Flextime refers to a work contract that allows employees to take increased authority for when to allocate work during the day, within certain time frames

(8). Thus, flextime is primarily intended to increase flexibility in when employees perform their work, although flextime can include, to some extent, flexibility also in where and how to perform the work, in agreement with the manager. Non-regulated working hours, also called trust-based working time, refers to employees being trusted to handle their own work, whit a focus on their achieved goals rather than on actual hours worked (10). Non-regulated working hours are intended to increase flexibility in when, where, and how to perform the work. Another type of FWA that has become increasingly common after the COVID-19 pandemic, is telework (11). Telework refers to a work arrangement "where employees are not located at a central office building, but rather work at a distant location" (11, p. 14). Therefore, telework is intended to increase flexibility in where work is performed, although it is often combined with other forms of FWAs (12), for example, employees with non-regulated working hours can usually telework a few days a week (13).

Having an FWA is common among white-collar workers, and especially among knowledge workers which term refers to individuals who "have to acquire, create and apply knowledge for the purposes of their work" (14, p. 51-52), and who are referred to as office workers in paper I, and office-based employees in papers II, III, and IV. In general, more men than women in Sweden have FWAs, which may be explained by the fact that men are more represented in occupations and positions where FWAs are prevalent, such as knowledge work and management positions (15,16). This thesis focuses on office-based employees who had non-regulated working hours or flextime, all of whom had the opportunity to telework to some extent, in agreement with the manager.

In general, FWA is an attractive work arrangement for both organizations and employees because of higher profitability within organizations and improved WLB among employees (17,7). However, although employees have the same type of FWA, their perceived flexibility (i.e., control over when, where, and how to perform the work) can vary (18,19). According to empirical studies (18,20), perceived flexibility is suggested as a key factor for WLB. However, whether employees experience a high or low degree of perceived flexibility may depend on the compatibility between actual and preferred extent of flexibility (18,21). The actual flexibility refers to what extent employees actually work flexibly, while preferred extent of flexibility is determined by the employees' desired preferences and needs for working flexibly (22). For example, some employees with non-regulated working hours make full use of flexibility regarding when, where, and how to perform their work, while others use the flexibility to decide either their working hours or their workplace. Other employees may not make use of the flexibility at all, although they have the opportunity (22).

The degree to which employees achieve the preferred extent of flexibility can be affected by factors related to both work (e.g., high job demands), and private life (e.g., the family situation). It is likely that a mismatch occurs between actual and preferred extent of flexibility, which can result in lower degree of perceived flexibility and in turn impaired WLB (18). Thus, it is

important for organizations that offer FWAs to support employees in finding work strategies that increase their perceived flexibility.

Trends in Flexible Work

The idea of FWAs emerged because of the Fourth Industrial Revolution during the 21st century (23,24). This development entailed a dramatic increase in digitalization which enabled employees to use work-related information and communication technology (ICT), despite where work was located (25). ICT use refers to the use of a laptop, tablet, or smartphone to handle information and facilitate communication, enabling employees to connect to work at anytime and anywhere (25). As a result, organizations were able to implement FWAs to a greater extent than before (23,24). The trend has increased worldwide, but FWAs are most prevalent in Europe, and especially in the Nordic countries (26). In 2019, before the COVID-19 pandemic, approximately 40% of employees in Europe were able to decide when to work during the day, with the highest percentage of FWAs in Sweden and Finland. Specifically, 65% of the Swedish workforce had some flexibility in when they worked, and 35% had some flexibility in where they worked, for example from home (26). A second wave of increased FWAs occurred during the COVID-19 pandemic, where many employees were forced or recommended to work from home as an action to reduce the spread of the virus (27). Today, many organizations allow employees to work from home to a greater extent than before the pandemic. Thus, FWAs were developed into a new global work form, which has been suggested to be the "new normal" (27,28).

The development of FWAs has changed traditional work models where employees were at the office between 9am and 5pm, five days a week, to a more boundless work situation (29). Thus, temporal, and spatial boundaries between work and private life have become weaker and employees can, to a greater extent than before, adapt their work based on individual needs. For example, employees with an FWA, especially those with non-regulated working hours, can end the working day earlier to pick up children from school and instead work in the evening. This means that regular working hours have become blurred (29). However, this thesis mentions "work outside regular working hours" which refers to work during non-traditional working hours, such as evenings and weekends. This may not be a correct expression since employes with FWAs can work during evenings and weekends even though it is still within their agreed working hours (i.e., 40 hours per week). Nevertheless, "work outside regular working hours" is used to describe how employees can use FWAs and to explain problems that may arise when working outside traditional working hours. For example, employees with FWAs are not on site to the same extent as before, which has caused challenges for several psychosocial work environmental factors, such as leadership, social support from colleagues, and social community at work (30). The work culture has also changed as the possibility to always be connected to work has created an "always-on culture" with expectations about availability within the organization, even after regular working hours (5).

Thus, it may be important for organizations that offer FWAs, to provide employees support, both individual and within the work group, to handle work in a way that preserves positive aspects and reduces negative consequences of FWAs.

Work-Life Balance

The concept of WLB emerged during the mid-20th century (31,32). At that time, more women were entering the workforce as an action to reduce labour shortages, which increased the prevalence of dual-income households and change traditional gender roles (31,32). Despite full-time work, women continued to take the main responsibility for home and family, which created dual roles and increased the risk of interference between work and family life (33). Since then, researchers have taken an interest in studies regarding the balance between work and family life. Subsequently, the research changed focus, from investigating family life to considering the whole life situation including all working individuals and all activities during work and non-work hours. This was the starting point for the conceptualization of WLB (33).

Work-life balance is a comprehensive concept. One review (34) describes the literature on WLB as an array of studies based on different definitions. It reveals the inconsistency of the concept and the problem of capturing the full meaning of WLB in one simple definition. However, an overall definition of WLB (used in this thesis) is; "the individual perception that work and non-work activities are compatible and promote growth in accordance with an individual´s current life priorities" (34, p. 326). In this thesis, to capture individuals' experience of engagement in work and non-work activities and possible spill-over effects between them, the concepts of work-home interference (WHI) and home-work interference (HWI) have also been included. Whereas WHI means that work impedes on time and energy that are intended for home and family, HWI suggests that home and family impede on time and energy that is actually intended for work (35).

There are different ways to achieve a good WLB. Both empirical (36,37,38) and theoretical studies (39) suggest psychological detachment from work as an important factor for WLB. Psychological detachment can be defined as "refraining from job-related activities and mentally disengaging from work during time off the job" (40, p. 72). Psychological detachment gives employees an important break from work during leisure time, which can enrich their private life with more time and energy, and in turn lead to better WLB (41). Also, employees with a high degree of psychological detachment from work find it easier to handle job demands, which is important to reduce the risk of negative spill-over between work and private life (41).

However, how much employees want to detach from work during leisure time is determined by individual boundary management preferences (42). For example, some employees prefer to separate between work and private life outside regular working hours (i.e., segmentation), while some employees prefer to integrate work and private life (i.e., integration). The preferences may vary during different stages of work and private life, and some individu-

als prefer to alternate between segmentation and integration during the working week (43). This can be understood based on the Boundary Theory, which refers to "the ways that people create, maintain, or change boundaries in an effort to simplify and classify the world around them" (44, p. 101). According to empirical research (36,42), there are no differences in WLB between segmenters and integrators, although integrators tend to work more hours during the work week than segmenters. Therefore, the type of boundary management strategy may not matter for WLB as long as employee can implement them in a desirable way (36).

Employees who achieve their preferred boundary management preferences are more likely to experience a good WLB (45). A good WLB has been reported to improve job performance, job and life satisfaction, and health (46), wellbeing, and work-related attitudes (47). Also, a good WLB has been suggested to reduce stress (1), somatic symptoms (48) and conflicts between work and private life (46). On the other hand, employees who do not achieve the preferred boundary management preferences are more likely to experience a poor WLB (45). A poor WLB can increase sickness absence (49,50), depression, anxiety, somatic complaints, conflicts between work and private life (46), and stress (51). Furthermore, a poor WLB is suggested to reduce psychological wellbeing (51) and family satisfaction (46). Therefore, it is important for organizations to support employees in finding strategies to increase psychological detachment from work during leisure time to achieve and preserve a good WLB in FWA, with respect to their preferred boundary management strategy.

The Influence of Job-Demands and Resources for Work-Life Balance in Flexible Work

Flexible work arrangements can imply both opportunities and challenges for WLB (30). This can be explained by the autonomy paradox, which describes dual effects of autonomy (52). This means that autonomy can reach a critical point when the effects turn from positive to negative (52). The "ideal" level of autonomy is still unknown, and the line between job autonomy and excessive job autonomy is weak (53). Also, the "ideal" level of autonomy can differ between individuals and as mentioned above, some employees prefer to separate work and private life while others prefer to integrate them to achieve a good WLB in FWAs. However, employee's ability to achieve and maintain their preferred boundary management preferences can be influenced by several occupational factors (30,54). This is explained by the Job Demands-Resources (JD-R) model (55,56,57), which describes occupational factors as either job demands or job resources. The JD-R model has previously been examined in the context of WLB, suggesting that too much job demands can result in poor WLB, while sufficient resources can result in improved WLB (58,59). Job demands and resources can also interact with each other to result in either positive or negative outcomes (57). According to the JD-R model, job autonomy, which refers to the "degree to which the job provides substantial freedom, independence, and discretion in determining goal-directed behavior at work" (57, p. 3), is suggested as a resource that can mitigate the

negative effects of job demands and reduce the risk of negative outcomes. Therefore, it is likely that a high degree of perceived flexibility affecting control over when, where, and how to perform the work, which previously has been identified as a resource for employees WLB, will buffer negative associations between job demands and WLB, as well as other negative outcomes (57,18,60). Thus, employees with a high degree of perceived flexibility may find it easier to handle job demands and therefore experiences a good WLB regardless of the degree of demands.

Previous research on FWAs has identified both job demands and job resources as precursors for employees' WLB (30,54). These can occur on several levels, for example organizational, work group and individual level (30,54). On an organizational level, resources may be organizational policies and clear guidelines for FWAs (61). Also, leadership behavior, especially relation-oriented leadership focusing on socialization, consideration, and trust is suggested as an important resource for employees' WLB (58). Demands on an organizational level may be quantitative job demands, which can challenge employees' ability to combine work and private life in a preferable way (54,29). Also, employees with FWAs tend to handle high job demands by working evenings or weekends, in addition to a full workday, which can impair their WLB (54,29).

Within the work group, job resources related to WLB can be social support from colleagues, a good social community, and a culture encouraging FWAs (30). For example, the culture within the work group is important to reduce the risk of employees feeling bad conscience when using the possibility to work flexible, or a mistrust from colleagues about working less than agreed (30). Job demands for employees' WLB within the work group can be expectations of availability, which can cause a norm of an "always-on" culture within the organization where employees feel compelled to respond to work-related emails and phone calls, even after regular working hours (5). Thus, expectations of availability can lead to employees working more than agreed, which can cause difficulties for psychological detachment form work during leisure time, and in turn result in poor WLB (1,62).

At an individual level, boundary management is a crucial resource to achieve preferred boundary management preferences (i.e., segmentation or integration) and in turn a good WLB in FWAs (44,42). On the other hand, job demands related to individual behavior can be overtime work, which steels time and energy from private life, and in the long run, challenge employees to achieve and maintain a good WLB (42,52). Demands and resources can also be found in the private domain, such as the family situation, which, in line with the JD-R model, can interact with occupational factors to predict either positive or negative outcomes (58). Although private factors play a central role in the WLB concept, this thesis is limited to focusing on occupational factors. However, some individual behaviors related to work can act as either job demands, or job resources related to WLB. For example, ICT use is generally a resource for WLB since it enables employees to work at anytime and anywhere, based on individual needs (17,7). Thus, work-related ICT use can simplify everyday life and lead to a good WLB. On the

other hand, too much work-related ICT use can lead to more work than agreed and difficulties in psychological detachment from work during leisure, which affects employees' WLB negatively (29). Another individual behavior that can act as either job resource or job demand is over-commitment to work, which is defined as, "a set of attitudes, behaviors and emotions that reflect excessive striving in combination with a strong desire to be approved of and esteemed (63, p. 55). To be committed to work is in general a positive behavior since it can improve job satisfaction and lead to a good WLB (54,64,65). However, too much commitment to work can challenge employees' ability to detach from work during leisure time and instead result in poor WLB (54). These dual factors can be explained by the "too much of a good thing" theory, which refers to the condition when beneficial factors reach a breaking point and result in negative effects instead of positive ones (66). Thus, several occupational factors can improve or impair employees' ability to achieve and maintain a good WLB. More research investigating job demands and job resources related to WLB among employees with FWAs is needed to aid the development and implementation of interventions.

Changes in Work Strategies to Improve Work-Life Balance

A considerable challenge with FWAs may be to organize work in such a way as to improve WLB. One way is to support employees in finding strategies to increase psychological detachment from work during leisure time (6), which is an important factor to improve WLB (36,37,38). Such strategies may be more appropriate for segmenters since it match their preferred boundary management strategy (i.e., separate between work and private life) (36). However, although integrators prefer to blend work and private life to a greater extent than segmenters, strategies intended to increase psychological detachment from work can be equally important to achieve a good WLB. This can be explained by the increased control to turn off work during leisure, both cognitively and emotionally (36,38). An intervention study (36) found that both segmenters and integrators improved their WLB after implementing boundary management strategies (i.e., mindfulness training) intended to increase psychological detachment from work during leisure time.

It has been suggested that organizational support in changing work strategies is more effective in increasing psychological detachment from work than organizational changes or changes in job design (6). Previous research suggests that metacognitive skills, such as self-leadership, are valuable for handling demands of FWAs (67). The autonomy that comes with FWAs also leads to more responsibility for the employees regarding how to organize their own work. Self-leadership, which refers to how employees lead and manage themselves, is intended to develop individual strategies to increase self-control (68). Self-leadership has previously been associated with improved work performance and job satisfaction, and reduced stress and anxiety. Furthermore, supporting employees in developing work strategies to increase self-control has been suggested to be an effective way to improve employees' productivity (68). Therefore, increasing their self-leadership ability and developing own structures and strategies in FWAs may be valua-

ble for employees (69). One example of an FWA work strategy of relevance to WLB may be to avoid checking emails during non-working hours (69).

Self-leadership can also exist at a group level, for example being conducted in self-leading teams (68). Work groups are suggested to have the ability to internally regulate their behavior within the group. As one review describes it "self-leadership occurs when teams and individuals perceive a situation, choose to engage in behavior to align actions with standards, monitor activities and cognitions to encourage the desired behavior, and then assess how the behavior influences the situation" (68, p.186). Individual self-leadership and work group-level self-leadership interact with each other, and self-control in one domain can spill over to the other domain (68). Even self-leading teams can improve productivity and performance within the work group. Therefore, organizations offering FWAs should focus on supporting employees and work groups to develop individual and common structures and strategies to manage demands in a beneficial way (68). However, more research is needed to identify what work strategies at different levels (e.g., at the work group and individual level) are needed and how they can be implemented and evaluated to promote a good WLB.

Occupational Health Interventions in Flexible Work

Although having an FWA is common in modern working life, there is a lack of research on workplace interventions to strengthen resources and reduce excessive demands in FWAs, especially in relation to WLB (2,70). Previous intervention studies of FWAs have mainly investigated WLB (71), or various health-outcomes after the implementation of FWAs (2). However, few studies have investigated the effects of interventions aimed at improving working conditions or work strategies of workers who already have an FWA.

Some intervention studies have focused on developing strategies to improve WLB, such as self-training in mindfulness to facilitate detachment from work during leisure time (36,72). Other intervention studies have developed individual strategies to increase psychological detachment from work during leisure time to improve WLB (6). For example, a meta-analysis (6) comprising 34 workplace interventions indicated that stress-managing strategies may be effective in promoting detachment from work. More specifically, the most effective initiatives focused on boundary management, emotion regulation and sleep improvement strategies (6). Such strategies have been implemented in various occupations, but not specifically in FWAs (6,36,72), although detachment from work has been suggested to be an important factor in achieving a good WLB in FWAs (62,5). One systematic review (4) calls attention to intervention studies focusing on developing strategies to meet job demands in FWAs. Still, we do not know how to design and implement interventions that can effectively empower individuals to find alternative work strategies which may make it easier to detach from work during leisure time, and thus improve WLB.

Development of Organizational Interventions

One way to improve WLB in FWAs may be to develop organizational interventions to "achieve the intended outcomes by changing the way work is organized, designed, or managed" (73, p. 1). One type of organizational intervention that can be beneficial in improving WLB is occupational health interventions since they investigate "real-world changes" (74). Occupational health interventions can be defined as "planned, behavioral, science-based actions to remove or modify the causes of job stress" (75, p. 601). To achieve positive effects of occupational health interventions, it is important to follow a structured process (75). Hence, when developing an occupational health intervention, there are various frameworks that can be used to facilitate a structured process during the development, implementation, and evaluation of the intervention (76,74). The most commonly used frameworks when developing complex organizational interventions are the Sigtuna Principles for designing, implementing and evaluating organizational interventions (73); the Psychosocial Management Approach (PMA) (76); and a new framework for developing and evaluating complex interventions by the UK Medical Research Council (77). Common components of these frameworks, which may be important to consider when developing organizational interventions are; 1) inclusion of stakeholders in the intervention process; 2) understanding of the organizational context and identification of problem areas; and 3) development, refinement, and adaptation of the intervention activities (73,76,77).

Specific for these frameworks is that they all relay on co-creation and participation. Co-creation is defined as "academics, consumers, clinicians, and service organizations working together from the outset to frame relevant research questions, create research designs that map real-world environments, and commit to implementing the research and its findings in the broader health service community" (78, p. 283). Co-creation is important in all phases of an intervention (i.e., development, implementation, and evaluation). Participation also referred to as Participative Ergonomics (PE) is defined as "The involvement of people in planning and controlling a significant amount of their own work activities, with sufficient knowledge and power to influence both processes and outcomes in order to achieve desirable goals" (79, p. 1071). This approach has shown positive results in sustainable behavioral change and employee job satisfaction (80). This has been used in many organizational interventions, some of which have included WLB as an outcome (71). Hence, occupational health interventions may use both co-creation and a participatory approach to successfully identify changes that are adapted to the needs of both the organization and the employees (76,80,81).

When developing interventions, researchers need to understand the organizational context and the current situation in the organization, such as working conditions, and perceived problem areas, to understand why and where interventions are needed (73). Therefore, when developing an intervention to improve WLB in FWAs, it is important to identify resources and demands of relevance for WLB within the organization. However, previous research has

mainly focused on separate occupational factors in relation to WLB, especially investigating individual-level factors, such as boundary management (82). Therefore, it is important to target a broader range of occupational factors associated with different levels, such as the organizational, work group, and individual level, to establish improvements. The second step in the development of an intervention is to identify suggestions for improvement to understand what improvements are needed to strengthen the resources and reduce excessive demands in FWAs (73).

An important part in the development of an intervention is to explain the theory of the expected change (83). Interventions are usually preceded with strategies for how to achieve the desired change, although many intervention studies do not explain the theory behind. This theory of change can be either implicit or explicit (84). An implicit theory is, for example, when describing an intervention that is underpinned by a strategy intended to educate employees to increase knowledge, which in turn result in the intended change (83). An explicit theory of change is, for example, when describing an intervention that is underpinned by involvement from the investigated organization, such as co-creation (83). However, it may be difficult to determine one specific theory of change for a planned intervention, and it is possible that the theory behind the intended change is grounded in both implicit and explicit strategies (84).

To close the gap between the current and the desired situation in the organization, it is important to find suitable intervention activities (73). To this end, researchers need to consider the logical link between possible activities and desired proximal and distal outcomes. This, in the theory of change, is referred to as program logic which is used to understand why some intervention activities are assumed to result in specific outcomes (85,86,87). This strategy may be helpful in formulating a realistic goal for the intervention and in finding suitable intervention activities (73). After identifying proper activities, another important step in the development of an intervention is to prioritize between the intervention activities (73). One way of doing this is by considering the balance between the investment of the organization and the potential effects that can be achieved.

Implementation Strategies

The success of an intervention depends both on the development of the intervention (i.e., the extent to which the intervention activities have potential to achieve the desire change) and the implementation of the intervention (i.e., the extent to which the planned intervention has been received in the organization and by the employees) (86). Previous research has identified some important implementation strategies that should be considered when implementing organizational interventions (73,88,89). One of the most highlighted strategies for a successful implementation of organizational interventions are co-creation and participation. For example, the organization has the best insight into the organizational context and what improvements are required and where in the organization they would be needed (73,78). Involving employees in the implementation is crucial to ensure that the implemented activ-

ities not only meet the need of the organization but are also perceived as relevant and suitable to the employees (80).

As organizational interventions are usually complex and comprise multiple components, intervention activities should be implemented at multiple levels within the organization (90,91). This can include the individual, group, leadership, organization, and overarching/social context (IGLOO levels) (91), or the same without the overarching/social context (IGLO levels), or without the overarching and leadership level (IGO levels) (73). In this thesis, IGO levels have been included in papers II, III and IV, but discussed in a different order, namely the organizational, group, and individual (OGI) level. Interventions targeting several levels within the organization have been suggested to be more effective in improving employees' performance, health, and wellbeing since an action at one level may be dependent on an action at another level (73,92). For example, changing work strategies to facilitate psychological detachment from work may be important for employee WLB, but expectations of availability at a group level may hinder employees from performing the new strategies in achieving a good WLB. Therefore, it is likely more effective to implement changes on several levels simultaneously (73,92).

Another important implementation strategy to consider is for whom in the organization the intervention may be relevant (74). Directing interventions where they are needed is important for the intervention to show effects (74). An increased understanding of the implementation process can enable a successful implementation of the intervention activities and in turn increase the chances that the intervention will lead to the intended change (80).

Evaluation of Organizational Interventions

Organizational interventions (e.g., occupational health interventions) are challenging to evaluate because the intervention and the context in which they operate is usually multi-faceted and complex (74). Evaluation of organizational interventions require careful consideration of whether the specific context within which the intervention was implemented has affected the results (74,93). Therefore, it may be beneficial to do a process evaluation to investigate whether any organizational or psychological mechanisms have influenced the outcome, either positively or negatively (75,94). Relevant components to evaluate in a process evaluation are reach, dose delivered, dose received, satisfaction and relevance of the intervention (75). Reach is defined as the extent to which the implemented intervention reached the intervention group, i.e., how many of the intended participants attended in the intervention activities. Dose delivered refers to the extent to which the intervention activities were delivered as intended, while dose received refers to the extent to which the intervention activities were received by the intervention group. To evaluate the feasibility of the intervention activities, it is important to understand whether the participants were satisfied with the intervention and perceived it as relevant to their work (75).

The effects of an intervention may also be determined by the development and the used implementation strategies (74,77,93). Therefore, the evaluation of the intervention should include considerations of whether the design

and/or implementation strategies have affected the result (74,77,93). If an intervention did not show the expected effects on outcomes, it is important to consider why. Some reasons can be theory/programme failure or implementation failure (75). Theory/programme failure refers to when the theory behind the intervention activities does not target the actual problem, while implementation failure refers to when the intervention activities were not successfully implemented or designed in a way that causes the intervention to fail even if the theory behind is appropriate (75).

When evaluating the effects of interventions, the outcomes can be either proximal (short-term) or distal (long-term) (95). Previous intervention studies of employees with FWAs have mainly focused on distal outcomes, such as health or burnout (48). However, including proximal outcomes facilitates a better understanding of the pathway of effectiveness (95). Thus, intervention studies among employees with FWAs should focus on distal outcomes such as WLB, but also include proximal outcomes, such as changed work strategies, expectations of availability, or ICT use outside regular working hours, to better understand the link between the intervention activities and the effects on distal outcomes.

Theoretical Framework

This thesis relies on a theoretical framework, based on two central theories, namely the Boundary Theory (44) and the Job Demands-Resources model (JD-R) (55,56). These theories have the potential to describe employees' ability to achieve WLB, and whether demands and resources, either independently or in interaction with each other, can improve or impair employees' ability to achieve a good WLB in FWAs. The Boundary Theory is defined as "the ways that people create, maintain, or change boundaries in an effort to simplify and classify the world around them" (44, p.101). This theory has an individual perspective to understand how employees can create and change boundaries between work and private life, based on individual boundary management preferences (i.e., segmentation or integration), to achieve a good WLB (44). In FWAs, the ability to achieve a good WLB can be challenging due to the possibility to be connected to work at anytime and anywhere (25). Thus, the Boundary Theory was considered as relevant to explain how employees with FWAs can create and maintain boundaries to achieve a good WLB in a, to some extent, boundaryless work.

Employees' WLB in FWAs can be affected by job demands and job resources, which either independently or in interaction with each other can improve or impair employees' ability to achieve a good WLB (58,59). For example, it may be possible to achieve a good WLB despite of high job demands if the employee simultaneously experiences sufficient resources, such as perceived flexibility (96). Thus, the JD-R model (55,56) has been included as a central theory in this thesis to better understand the complexities of achieving WLB in FWAs. The JD-R model is an occupational stress model, developed by Bakker and Demerouti in the early 2000s. JD-R was introduced in addition to other models in the same field such as the effort-reward imbalance model (97), and the job demands-control-support model (98,99). However, the JD-R model captures a broader perspective that targets demands and resources at several different levels, such as organizational, group and individual, and it may therefore be better to understand positive and negative associations with WLB and how they can interact with each other to either improve or impair WLB (58,59). Therefore, Boundary Theory and the JD-R model are relevant to understand demands and resources related to WLB (paper I), and to develop work strategies that focus on strengthening resources (i.e., boundary management and perceived flexibility) to easier handle possible demands in FWA (papers III and IV).

Rationale for the Thesis

Digitalization and the use of ICT have increased over the years, which has enabled organizations to offer their employees FWAs. Flexible work arrangements are primarily a desirable work form, but they can also create challenges. The positive side is the possibility to combine work and private life more easily, which can improve employees' WLB. A downside of an FWA is the possibility of always being connected to work, which can cause expectations of availability during non-working hours. This can in turn lead to more work than agreed, difficulties to detach from work during leisure time, and impaired WLB. Flexible work arrangements have changed the work environment, and the way people work, which may require new work strategies for the organization, the work group, and the individual to handle job demands. However, even though FWAs are common in modern working life, little is known about how FWAs can be organized and what work strategies can be employed to strengthen resources and improve WLB in FWAs. This may be important since previous research suggests a potential link between WLB and health-related outcomes. For example, a good WLB can lead to improved well-being, job-life satisfaction, and job performance, while a poor WLB can lead to depression, and increased stress and sickness absence. Thus, it may be important for both the organization and the employee to find work strategies that are preferable to strengthen the resources and reduce excessive demands to improve WLB in FWAs.

Overall and Specific Aims

The overall aim of this thesis was to develop, implement, and evaluate a workplace intervention among office-based employees with FWAs. More specifically, the aims were to: 1) identify demands and resources related to WLB; 2) in co-creation with the investigated organization, identify suggestions for improvements to guide the development of a workplace intervention; and 3) implement and evaluate the effect of an intervention, addressing some of the identified suggestions on proximal (i.e., work strategies, ICT use, productivity, and expectations of availability) and distal outcomes (i.e., WLB and interference between work and private life).

Paper I

The aim was to examine the extent to which selected occupational factors and individual behaviors are associated with WLB among office-based employees with FWA, and whether such associations are modified by perceived flexibility at work.

Paper II

The aim was to use a participatory approach to identify concrete suggestions and key areas for improvement that were considered relevant, effective, and feasible for promoting good work environment and health at the organizational, work group and individual level, among office-based employees with FWA.

Paper III

The aim was to determine the extent to which work strategies (i.e., how to handle emails, how to structure work tasks, how to prioritize work tasks, and how to minimize work interruptions), ICT use outside regular working hours, productivity, expectations of availability, and clarity of expectations about availability, had changed among office-based employees with FWA two and four months after a participative two-step workplace intervention, approved by the top management of the organization.

Paper IV

The aim was to determine the extent to which overall WLB, work-home interference (WHI), and home-work interference (HWI) had changed among office-based employees with FWA two and four months after a participative two-step workplace intervention, approved by the top management of the organization.

Methods

Organizational Context

The studies included in this thesis are based on a comprehensive research project in collaboration with a large governmental organization, the Swedish Transport Administration (STA). The organizations responsibility is to ensure that the Swedish transport system works. Their main tasks are to take responsibility for: 1) long-term planning of the transport system for rail traffic, road traffic, aviation, and shipping; 2) the construction, operation and maintenance of state-owned railways and roads; 3) interregional public transport; and 4) delegation of shipping support. The organization consists of 33 offices located in 20 different cities in Sweden. In 2016, when the research project started, the organization had 6,878 employees, 4,926 of whom were knowledge workers. The knowledge workers had FWAs, while the remaining employees had a fixed schedule or shift work. This thesis focuses on employees with FWAs, who by contract worked non-regulated working hours (approx. 70%) or flextime.

Project Organization

The research project applied co-creation throughout. This means the organization and the researchers at the University of Gävle worked in close collaboration. The project organization comprised a steering group, two project groups and two reference groups (see Figure 1). The steering group included members from both the organization (HR director and information technology (IT) director) and the university (research leader and the Dean of the Faculty). The responsibility of the steering group was to enable the collaboration between the organization and the university, to make financial decisions, and to make the overall decisions about project design, data collection, time planning and delegation of responsibility. The project group from the University of Gävle consisted of research assistants, PhD students and researchers. This group were responsible for detailed planning of each part of the project, collecting data, and delivering a report with the results to the organization after each part of the project. The project group from the organization consisted of communication strategists and HR specialists. This group were responsible to recruit participants, provide contact persons for the researchers before data collection and furnish information to managers and employees about the project and data collections. They were also responsible for disseminating the reports from the university in the organization, for example through information on the intranet. The reference group from the university consisted of researchers specialized in the research field. The reference group from the organization consisted of HR managers, business developers, market analysts

and Union representatives. Both groups were responsible for providing feedback on the design, method, and questionnaire before the data collections.

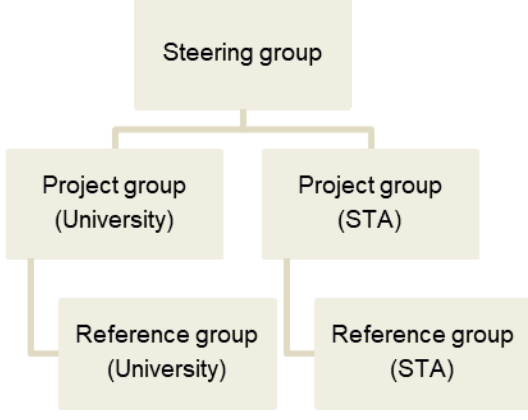

Figure 1. Flowchart of the organization of the project, consisting of one steering group for the whole project, and one project group and one reference group for each organization respectively, the University of Gävle and the Swedish Transport Administration (STA).

Research Project

The research project "Flexible work: Health-promoting Interventions for Sustainable Digitalized Work" was initiated after a request from the organization following their observations of increased stress-related symptoms and sickness absence among employees. The organization suspected that this was related to increased FWAs and work intensification. The overall aim and long-term goal of the project was to reduce the negative consequences of FWAs and preserve the positive aspects by developing, implementing, and evaluating a workplace intervention. The research project lasted from 2016 to 2020 and consisted of three parts: 1) a work environment and health questionnaire to identify demands and resources in FWAs (data collected in 2016); 2) focus group interviews to collect employees' suggestions for improvements (interviews conducted in 2017); and 3) a workplace intervention to change work strategies at both an individual (implementation of an educational program) and a work group level (implementation of workshops), collected during 2018–2020. The first two phases of the research project were preparatory work to develop the intervention, while the third phase consisted of implementation and evaluation of the intervention. The papers included in this thesis followed the three phases of the project. See Figure 2 for a flowchart of the research project and the link between the three phases of the project, reported in the four papers of the thesis.

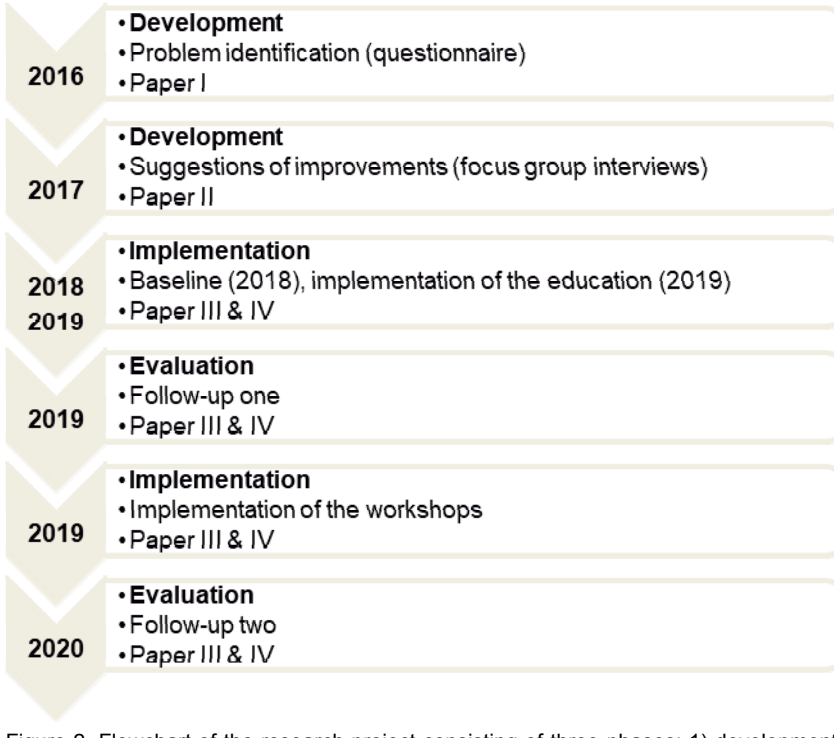

Figure 2. Flowchart of the research project consisting of three phases: 1) development phase, including problem identification and suggestions for improvements to aid the development of an intervention; 2) the implementation phase, including implementation of the intervention activities (i.e., education and workshops); and 3) the evaluation phase, with baseline, and two follow-up measurements to evaluate the effect of the intervention on proximal and distal outcomes.

Overview of the Included Papers

Table 1 presents an overview of the papers included in the thesis, describing the focus of the papers, design, data collection and sample, and analyzes. A more detailed description is provided in the text section below.

Table 1. Overview of the papers included in this thesis, describing the focus, design, data collection, sample size and analyzes.

Paper	Focus	Design	Data collection and sample	Analyzes
I	Organizational, psychosocial, leadership and individual determinants of WLB in FWAs	Cross-sectional study	Web-based survey (n=2,960)	Linear regression analysis
II	Participatory approach to identify concrete suggestions and key areas for improvements to promote the working environment and health in FWAs	Mixed methods	Focus group interviews and estimates of how effective and feasible each suggestion was in promoting the working environment and health (n=45).	Mapping of suggestions at the OGI level. Similar suggestions were grouped and categorized as key areas.
III	Effects of a controlled workplace intervention on work strategies, ICT use outside regular working hours, productivity, and expectations of availability.	Intervention study	Web-based survey at baseline and two follow-ups. Intervention (n=97) and control group (n=70).	ANOVA and LMM for repeated measurements.
IV	Effects of a controlled workplace intervention on WLB and WHI/HWI.			

Note. FWAs = flexible work arrangements; OGI = organizational, work group and individual; ICT = information and communication technology; ANOVA = analysis of variance; LLM = linear mixed model; WLB = work-life balance; WHI = work-home interference; HWI = home-work interference.

Design

Paper I

Paper I describes a cross-sectional study that was based on a work environment and health questionnaire, which examined the association of organizational factors, leadership behavior, psychosocial factors, and individual behavior with WLB.

Paper II

Paper II was a mixed-method study based on focus group interviews aimed to collect employee suggestions for improvements to promote a good work environment and health with FWAs. The quantitative part of the study consisted of individual ratings of how effective and feasible the employees perceived each of the suggestions to be and how likely it was that they would promote a good work environment and health in FWAs. The same focus group interviews were conducted with three groups of managers (first-line and middle-managers, and the top management of the organization). The results, together with results from the focus group interviews with the employees, were used to develop the intervention. However, the management interviews were not included in paper II.

Papers III and IV

Papers III and IV were controlled workplace intervention studies with a quasi-experimental design including baseline measurements and two follow-ups, in one intervention group and one control group.

Intervention Design

Based on the results from the work environment and health questionnaire (from 2016) and focus group interviews (2017), the researchers, together with the HR department and top management of the organization, discussed what factors and suggestions for improvements would form the basis of the intervention. These discussions resulted in a workplace intervention focusing on developing employees' ability to work more efficiently and more "smartly" to easily detach from work during leisure time, when using ICT in FWAs. Thus, the HR department and the top management of the organization, in collaboration with the research group, developed and implemented a two-step workplace intervention. The first step consisted of an individual education to change employees' work strategies for how to handle emails, structure work tasks, prioritize work tasks, and minimize work interruptions. The second step contained workshops to develop common rules and routines for FWAs in the work group.

In the first step, an external company delivered the education consisting of seminars on: 1) how to use technical tools (4 hour webinar); 2) work strategies to use technical tools to work more efficiently (8 hours in-person training); 3) deepening of previously learned knowledge and repetition (4 hour

webinar); and 4) repetition in pairs (1 hour in-person) and practice in groups with the educator (1.5 hours webinar) within two weeks after each seminar.

In the second step, an external moderator delivered the workshops (in-person), which lasted approximately six hours. The workshops followed a systematic process model (100). These sessions involved discussions on the characteristics of a work group that facilitate an individual's ability to detach from work during leisure. Additionally, the participants explored factors contributing to or preventing a work group's sustainable efficiency, meaning work performed efficiently in a way that supports employees' health.

Thereafter, the participants listed the most important factors to become a sustainably efficient work group in a "to-do list". Based on this, an action plan was developed, containing rules and routines in FWAs. A subsequent step was to follow up the action plan by using a template to evaluate the extent to which the rules and routines had been implemented, scored on a scale ranging from 0 (not at all) to 10 (to a high extent). During the follow-up, it was also possible to remove and reformulate rules and routines and add new ones to the action plan.

Sample

The criteria for inclusion in all four papers were a work contract allowing for FWAs (flextime or non-regulated working hours). Exclusion criteria were part-time work, parental leave, or sick leave (paper I), holding a management position (paper II), and parental leave, sick leave, having left the organization, not having responded at baseline and at least one follow-up or not having participated in the first part of the intervention (education) (papers III and IV).

Paper I

The work environment and health questionnaires were sent out to all employees with FWAs (n=4,900), 3,259 of whom (67%) responded. After exclusion of employees with part-time work, parental leave or sick leave, the final sample consisted of 2,960 participants, the majority of whom had non-regulated working hours (70%) and 29% of whom had flextime (1% had other arrangements). The sample included both managers/project leaders (22%) and front-line workers (78%). The average age was 48 years and the sample consisted of 56% men. The most predominant level of education was college/university (63%).

Paper II

Employees from eight different departments were asked to participate in the focus group interviews. There were 49 employees who registered their interest, 45 of whom participated. The final sample was divided into eight departmental groups, with three to eight participants per group. Most of the participants had non-regulated working hours (82%) and 16% had flextime (2% missing). Almost all participants (98%) worked full-time (40 hours per

week), and the highest level of education was college/university (65%). The sample consisted of 51% men and the average age was 44 years.

Papers III and IV

Two departments from the same division and with a similar size and similar work tasks constituted the intervention group and the control group, respectively. In total, 288 employees received the baseline questionnaire, 217 of whom responded (75%). The final sample consisted of 167 participants at baseline (intervention group n=97 and control group n=70), 160 participants at follow-up 1 (intervention group n=94; control group n=66) and 153 at follow-up 2 (intervention group n=97; control group n=56). In both groups, the average age was 49 years, and most of the participants had non-regulated working hours (intervention group 85%; control group 90%). Both groups had university education as their dominant level of education (intervention group 75%; control group 79%) and a higher proportion of men (intervention group 65%; control group 54%).

Data Collection and Measurements

Paper I

Using the Webropol Survey software, the research group sent out an email to all managers and employees with FWAs in October 2016. The email included information about the study and a link to a comprehensive web-based questionnaire. Subsequently, three email reminders at 2-week intervals were sent out over the two following months. The employees gave their consent to participate in the study by answering the questionnaire. The validated work environment and health questionnaire asked about, among others, details of the FWA, perceived flexibility, psychosocial factors, leadership behavior, individual behavior, and WLB. Prior to the data collection, the whole questionnaire was validated using principal component analysis (PCA) and "think-aloud interviews" held by the researchers with the reference group from the organization, conducted by researchers from the research group (unpublished data). The reference group also provided written feedback after conducting a pilot test of the questionnaire. Thus, some original questions were modified to better fit the language of the organization. Included covariates were level of education (primary school, high school, vocational school, and college/university), years of employment in the present organization (years), gender (woman, man, or do not want to disclose), age (year of birth), children living at home (yes or no), marital status (single or living in partnership/married) and position in the organization (manager or employee). Paper I comprised 19 independent variables and one outcome variable, presented below.

Work-life balance was measured as the outcome, by using one single question, "How satisfied are you with your WLB?", with answers on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent. This question was modified from Hanson (67); the reference group had suggested that

the question should capture the extent to which the employees experiencing WLB. The original question is "Are you currently satisfied with your life situation in terms of the balance between work and private life?", with answers on a 5-point scale ranging from 1 = absolutely not to 5 = absolutely.

Perceived flexibility was measured by one index including four customized questions about the extent to which the respondent was able to decide when, where, and how they perform their work. Answers were scored on a 5-point scale, ranging from 0 = completely incorrect to 4 = completely correct (Cronbach's alpha (CA)=0.80).

Organizational factors were assessed with four customized single questions, concerning: flexible work arrangements, with the answer options flextime or non-regulated working hours); information about how to organize work, with answers on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent; unclear guidelines for flexible work, with answers on a 5-point scale, ranging from 0 = completely incorrect to 4 = completely correct; and office type, with the answer options cell-office, activity-based office or open plan office.

Leadership behaviors were assessed with three indices: relation-oriented leadership (CA=0.88); structure-oriented leadership (CA=0.85); and change-oriented leadership (CA=0.90), which included five questions each. The answers were rated on a 6-point scale, ranging from 1 = completely incorrect to 6 = completely correct (101,102,103).

Psychosocial factors were assessed by indices of the Copenhagen Psychosocial Questionnaire (COPSOQ), version two (104): quantitative job demands (four questions, CA=0.82); influence at work (four questions, CA=0.71); social community at work (three questions, CA=0.81); and social support from colleagues (three questions, CA=0.72). Answers were rated on a 5-point scale ranging from 1 = never/almost never to 5 = always. We used a single customized question to measure the extent to which employees experienced a culture that encouraged flexible work. Answers were rated on a 5-point scale, ranging from 0 = completely incorrect to 4 = completely correct. We also included the following indices from customized questions: expectations to work more than agreed (four questions, CA=0.80); expectations of availability (seven questions, CA=0.86); and clarity regarding expectations about availability (three questions, CA=0.86). All three of these indices included questions measured on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent.

Individual behaviors were assessed using two indices: over commitment to work (105), with a 4-point scale ranging from 1 = completely incorrect to 4 = completely correct (six questions, CA=0.83); and boundary management with a 5-point scale ranging from 0 = completely incorrect to 4 = completely correct (three questions, CA=0.87) (106). We also measured overtime work (hours/week) by using a single customized question and calculating the difference between a normal working week and actual working hours.

Paper II

In October and November 2017, eight focus group interviews (one per department) were conducted in the organization. All participants received an invitation to a focus group interview, along with the results from the work environment and health questionnaire for the whole organization, and their department-specific report, identifying demands and resources in FWAs (from 2016). These results were also presented by the moderator during the interviews as the foundation for the upcoming discussions on specific suggestions needed to promote a good work environment and health in FWAs. Prior to data collection, the research group prepared by having practice sessions and doing in-depth reading on tree diagrams. The tree diagram is an established tool that aims to develop concrete suggestions for improvements by breaking down a question into main themes, sub-themes, and concrete suggestions to implement (107,108).

The focus group interviews took place at one of the organization's offices and lasted approximately 4 hours. Each session started with information from the moderator about the procedure and rules to be followed during the interview, that is: the concrete suggestion should be feasible and should concern FWAs; everyone should have the opportunity to express their opinion; and no one should criticize anyone else's suggestions. Thereafter, all participants were asked to sign an informed consent form to participate in the study. The moderator presented the question to be discussed: "What interventions do you perceive as being most important to promote a good work environment and health in FWAs?" Each interview was conducted by a team of two researchers: a moderator, leading the discussion and for intervening if any participant monopolized the discussion, silence occurred or the discussion became irrelevant; and an assistant, responsible for taking notes and noting ideas for main themes, sub themes and concrete suggestions on a poster. Subsequently, individuals rated how effective and feasible each suggestion would be to promote a good work environment and health in FWAs, on a scale ranging from 0 = not at all to 10 = to a high degree. A dictaphone was used to record all interviews.

Paper III and IV

The implementation of the workplace intervention took place between March and June 2019 (education) and between August and October 2019 (workshops). Data were collected in both the intervention and the control group prior to the intervention (baseline), after the education (follow-up 1, 6 months after baseline) and after the workshops (follow-up 2, 12 months after baseline). At all three data collections, the research group sent out an email with information about the study and a link to a web-based questionnaire using Sunet Survey software. Email reminders were sent out over the next 2-3 months. At baseline, four reminders were sent to the intervention group and three to the control group. At follow-up 1 (after the education), five reminders went out to both groups and at follow-up 2 (after the workshops), three reminders were sent to both groups. The employees gave their consent to

participate in the study by answering the questionnaire. The data collection comprised a shorter version of the work environment and health questionnaire from 2016, with additional questions about experience of the intervention and change in work strategies. Included covariates were educational level (primary school, high school, vocational school, or university), marital status (single or in a partnership/married), children living at home (yes or no), and gender (woman, man or disclose).

Paper III – Measurements

In paper III, to evaluate the effect of the intervention, we measured the following proximal outcomes: changed work strategies; ICT use outside regular working hours; productivity; and expectations about availability. Outcomes were measured on all three occasions (baseline and the two follow-ups), except for changed work strategies, which were measured after the education (follow-up 1) and after the workshops (follow-up 2).

The change in work strategies was measured by a customized question about the extent to which employees had changed their work strategies regarding how to handle emails, how to structure work tasks, how to prioritize work tasks, and how to minimize work interruptions. Answers were rated on a 5-point scale ranging from 0 = not at all to 4 = to a high extent.

Information and communication technology use outside regular working hours was measured by one single question about the extent of work-related ICT use after regular working hours (109), with answers rated on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent.

General productivity was measured by one single question about the degree of productivity during the preceding month (110,111), with answers rated on a 10-point scale, ranging from 0 = not productive at all to 10 = highly productive.

Expectations of availability outside regular working hours was measured by an index including five customized questions (CA=0.82) with answers rated on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent.

Clarity regarding expectations about availability outside regular working hours was measured by an index including three customized questions (CA=0.89) with answers rated on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent.

Paper IV – Measurements

To evaluate the effect of the intervention in paper IV, we measured the following distal outcomes: WLB, WHI and HWI. Outcomes were measured on all three measurement occasions (at baseline and the two follow-ups).

Work-life balance was measured by the same single question that was used in paper I, namely, “How satisfied are you with your WLB?”, with answers on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent (112).

Work-home interference was measured by an index including three questions (CA=0.87), two of which were modified COPSOQ items (104), and one

of which was modified from Hanson (67). Answers were rated on a 5-point scale, ranged from 0 = not at all to 4 = to a very high extent.

Home-work interference was measured by an index including two questions (CA=0.82) modified from Hanson (67). Answers were rated on a 5-point scale, ranging from 0 = not at all to 4 = to a very high extent.

Data Analysis

Paper I

All statistical analyzes were conducted using IBM SPSS Statistics, version 24 (IBM Corp., Armonk, NY, USA). Descriptive data on the participants were presented as frequencies and percentage (categorical variables) and means and standard deviation (*SD*) (continuous variables). Multiple linear regression (MLR) analysis was used to examine the association between occupational factors, leadership behavior and individual behavior (independent variables) and WLB (dependent variable). We constructed three hierarchical regression models, 1) by adjusting for all covariates; 2) by adding each independent variable separately to determine its main effect; and 3) by separately adding perceived flexibility as an interaction variable on the association between the independent variables and WLB, to examine the possible effect modification. Subsequently, effect estimates for the independent variable (*B*), standard error (*SE*) of *B*, and change in explained variance from the previous model (ΔR^2), as well as *p*-value were determined for each model. The effect sizes were considered small ($R^2 \leq 0.02$), medium ($R^2 < 0.26$), and large ($R^2 \geq 0.26$) according to Cohen's criteria (113). A sensitivity analysis was performed on gender by re-running the hierarchical models including factor x gender (two-way) and factor x perceived flexibility x gender (three-way).

Paper II

Focus group interviews were analyzed by six researchers. Four conducted the entire analysis and two reviewed the analysis and provided feedback. Prior to the analysis, one researcher combined all concrete suggestions from the poster of each focus group into an Excel file. Subsequently, the four researchers read all suggestions and categorized them into OGI levels. Where opinion differed, the categorization was discussed by all six researchers until consensus was reached. A second step was to categorize similar suggestions into key areas, and, in some cases, sub-areas, within each OGI level. All key areas were then reviewed and revised until consensus was reached. The result of the qualitative analysis was presented by bubble diagrams to illustrate each OGI level and its included key areas. The quantitative part of the paper was analyzed by calculating the mean of the participants' perceptions of how effective and feasible the suggestions were promoting a good work environment and health in FWAs for each OGI level, key area, and sub-area. The ratings of effectiveness and feasibility were calculated both separately and in combination.

Papers III and IV

Analyzes were conducting using IBM SPSS Statistics, version 27 (IBM Corp., Armonk, NY, USA). To describe the background characteristics of the participants (intervention and control group) and the intervention group's experience of the intervention, descriptive data were used including means and *SDs* (continuous variables) and frequencies and percentage (categorical variables). Independent t-test (continuous variables) and Chi2 tests (proportions) were used to analyze group differences between the intervention and control group at baseline. One way between-groups analysis of variance (ANOVA) was used to analyze the differences between the groups in change of work strategies between follow-up 1 and 2. The effect size (partial eta squared) was determined as small (0.01), medium (0.06) or large (0.14), in accordance with Cohen's criteria (114,115). To examine the effect of the intervention on the outcomes, we used linear mixed models (LMMs) for repeated measurements. Separate models were constructed for each outcome variable including group (two levels: intervention and control) and time (three levels: baseline (reference), and follow-up 1 and 2), and the interaction between these (group x time) as fixed factors to examine the between-group differences in change over time. Participants and intercept were treated as random factors. Negative 2-residual log-likelihood (-2RLL) and Akaike's information criterion (AIC), in a first-order autoregressive (AR1) covariance structure with homogeneous variance, were used to test the goodness of fit. As a second step, we re-ran the analysis with adjustment for covariates. We determined the statistical significance level as $p = 0.05$ and the effects of the intervention (*B*) with 95% confidence intervals (*CIs*). Missing at random *(MAR)* was used to consider missing data. Subsequently, to examine whether the intervention had a greater effect on employees with extensive ICT use outside regular working hours, we performed a sensitivity analysis by re-running the analysis on employees who showed a high degree of ICT use at baseline (paper III). A sensitivity analysis was also performed on employees with a low degree of WLB, and a high degree of WHI and HWI at baseline, to examine whether the intervention had a greater effect on them (paper IV).

Ethical Considerations

All studies included in the thesis have been approved by the Regional Ethical Review Board in Uppsala (Reg. No. 2016/085; 2016/425/1; 2017/528). The Swedish legislation on research involving human subjects has been followed throughout (116). Before the data collection started, participants were informed that their participation was voluntary and that they could end it at any time and without explanation. To ensure confidentiality, participants were assured of anonymity and that their data would be secure. Also, participants provided their informed consent to participate in the studies. For the quantitative studies (papers I, III and IV), the research group sent out information about the research in combination with a link to a web-based questionnaire. Participants gave their informed consent by submitting the questionnaire. For the qualitative study (paper II), the researchers provided the participants with verbal and written information about the study and participants gave their written informed consent prior to participating in the focus group interviews.

Results

Development of the Intervention

Paper I

Overall, the employees (n=2,952) experienced a relatively high level of perceived flexibility (i.e., control over when, where, and how to perform the work) (mean 2.67, *SD* 0.90), scored on a 5-point scale ranging from 0 = completely incorrect to 4 = completely correct. The highest prevalence of perceived flexibility was found for control over when to perform the work (mean 2.84, *SD* 1.20), closely followed by how (mean 2.67, *SD* 1.01) and where (mean 2.41, *SD* 1.21) to perform the work. Also, the employees (n=2,960) perceived a relatively high level of WLB (mean 2.93, *SD* 1.00), rated on a 5-point scale ranging from 0 = not at all to 4 = to a very high extent.

Based on hierarchical regression models, first adjusted for covariates (level of education, gender, age, marital status, children living at home, years of employment, and position (employee or manager)), and then adding one occupational factor at a time, we found statistically significant associations for all investigated factors and WLB, except for work arrangement (flextime or non-regulated working hours) and office type (Table 2). Boundary management showed the strongest positive association with WLB, with a large effect size ($R^2 \geq 0.26$) (113), which means that higher boundary management was associated with higher levels of WLB. Other factors that were positively associated with WLB were information about how to organize work, social support from colleagues, social community, influence at work, perceived flexibility, leadership behavior (relation-, structure-, and change-oriented), culture encouraging flexible work, and clarity regarding expectations of availability. The strongest negative association with WLB was found for over-commitment to work, with a large effect size ($R^2 \geq 0.26$) (113), which means that higher levels of commitment to work were associated with lower levels of WLB. Other negative associations with WLB were found for quantitative job demands, expectations of availability, expectations to work more than agreed, unclear guidelines for flexible work, and overtime work. We found a statistically significant, albeit small, interaction effect, of perceived flexibility on several associations with WLB. Negative factors such as overtime work, expectations to work more than agreed, and expectations of availability were less pronounced among employees with a high degree of perceived flexibility. Some positive factors for WLB, such as structure- and change-oriented leadership, social support from colleagues, and information about how to organize work, were also less pronounced among employees with a high degree of perceived flexibility. Stratified analyzes and interactions by gender showed more pronounced effects among women than among men regarding overtime work and expectations of availability.

Table 2. Results from linear regression analyzes of occupational factors related to work-life balance (WLB). Participants ranged between 2,685 and 2,958 depending on investigated predictor.

Variables	Main effects			Interaction effects		
	B	*SE*	ΔR^2	*B*	*SE*	ΔR^2
Flex-time (ref non-regulated work hours)	0.08	0.05	0.001	0.22	0.05	0.008
Information how to organize work (scale 0–4)	0.31	0.02	0.089	-0.06	0.02	0.003
Unclear guidelines in FWAs (scale 0–4)	-0.19	0.02	0.050	0.01	0.02	<0.001
Activity-based office (ref cell office)	-0.03	0.05	<0.001	0.08	0.05	0.001
Open plan office (ref cell office)	0.02	0.05	<0.001	-0.01	0.05	0.001
Relation-oriented leadership (scale 1–6)	0.28	0.02	0.071	-0.02	0.02	<0.001
Structured-oriented leadership (scale 1–6)	0.25	0.02	0.054	-0.08	0.02	0.006
Change-oriented leadership (scale 1–6)	0.19	0.02	0.044	-0.03	0.02	0.001
Expectations work more than agreed (scale 0–4)	-0.34	0.02	0.088	0.07	0.02	0.004
Expectations of availability (scale 0–4)	-0.44	0.02	0.105	0.10	0.02	0.005
Clear expectations of availability (scale 0–4)	0.08	0.02	0.008	0.02	0.02	<0.001
Quantitative job demands (scale 1–5)	-0.67	0.02	0.227	0.02	0.02	<0.001
Influence at work (scale 1–5)	0.38	0.03	0.059	0.02	0.03	<0.001
Social community at work (scale 1–5)	0.41	0.03	0.070	0.00	0.03	<0.001
Social support from colleagues (scale 1–5)	0.41	0.03	0.080	-0.08	0.03	0.003
Culture encouraging flexibility (scale 0–4)	0.11	0.02	0.015	0.02	0.02	<0.001

Overtime work (hours/week)	-0.08	0.01	0.091	0.02	0.01	0.003
Over-commitment (scale 0–4)	-0.87	0.02	0.317	0.02	0.03	<0.001
Boundary management (scale 0–4)	0.63	0.02	0.316	0.01	0.02	<0.001
Perceived flexibility (scale 0–4)	0.29	0.02	0.065			

Note. Data are presented as beta *(B),* standard error *(SE)* of *B*, and contribution to explained variance *(ΔR^2)* for main effects of occupational factors and individual behavior, on WLB, and interaction effects of perceived flexibility on these associations. All analyzes presented are adjusted for covariates such as gender, age, children living at home, marital status, level of education, years of employment, and position (employee or manager). Covariates explained 2% of the variance in WLB (ΔR^2=0.020). FWAs = flexible work arrangements.

Paper II

Based on the focus group interviews, we found 279 suggestions to promote a good work environment and health among employees with FWAs. These were categorized into 18 key areas and divided into OGI levels (Figures 3–5). Most suggestions (relating to 13 key areas) were made at an organizational level, where the most pronounced key areas concerned leadership in FWAs, development of a shared vision, guidelines, and support for FWAs, and development of technical systems to enable efficient work in FWAs. At a work group level, we identified two key areas that focused on development of common rules about availability in FWAs, and development of common office rules for activity-based working. Three key areas concerned the individual level including clarification of availability in FWAs, prioritizing breaks to promote recovery, and personal responsibility for health and the work environment. The mean value for the combination of effectiveness and feasibility to promote a good work environment and health in FWAs was high for all key areas, but the highest values were found for "Encourage wellbeing and physical activity during working hours" (organizational level), "Create common rules regarding availability in flexible work" (group level), and "Clarification of availability in flexible work" (individual level).

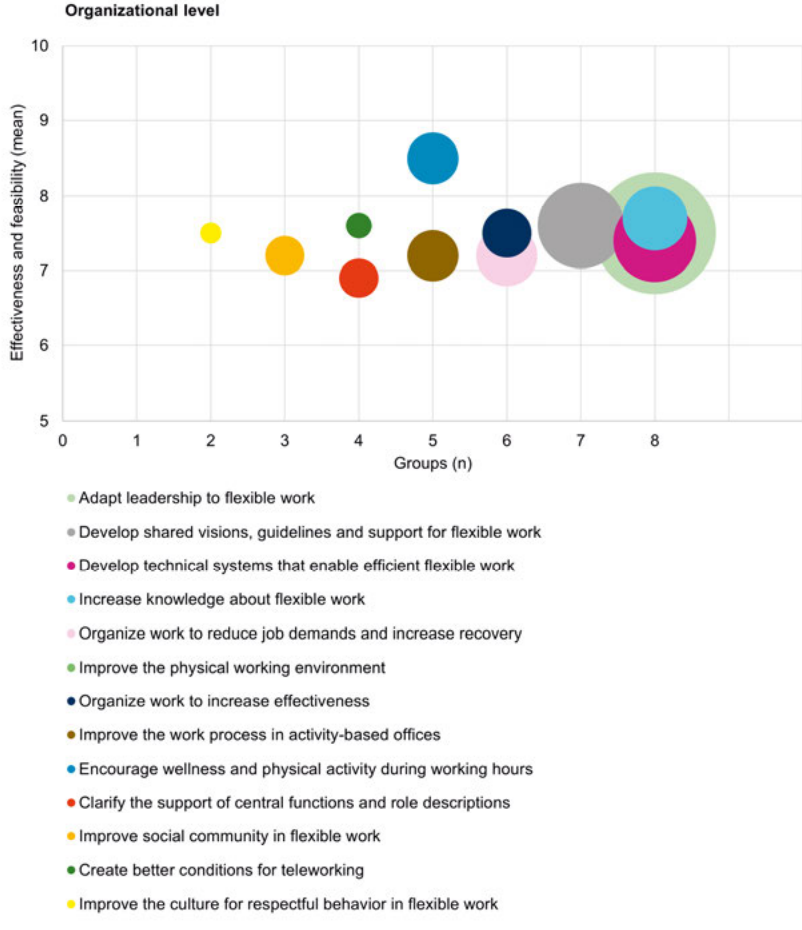

Figure 3. Bubble diagram of suggested key areas for improvement at the organizational level. The number of suggestions in each area is represented by the size of the bubble. The x-axis shows how many of the groups made suggestions for improvement to the key area (range 0–8). The y-axis presents the mean estimated feasibility and effectiveness (scale 0–10) of all included suggestions in each key area.

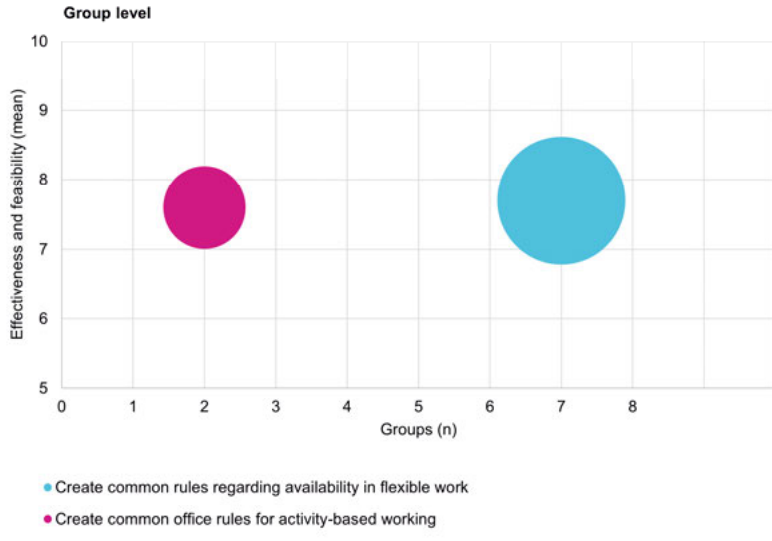

Figure 4. Bubble diagram of suggested key areas for improvement at the group level. The number of suggestions in each area represent the size of the bubble. The x-axis shows the number of groups that made suggestions for improvement to the key area (range 0–8). The y-axis presents the mean estimated feasibility and effectiveness (scale 0–10) of all included suggestions in each key area.

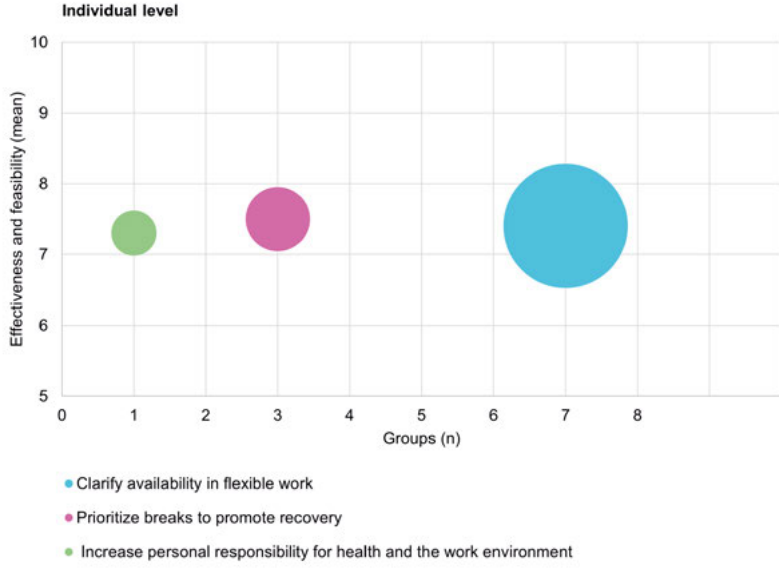

Figure 5. Bubble diagram of suggested key areas for improvement at the individual level. The number of suggestions in each area represent the size of the bubble. The x-axis shows the number of groups that made suggestions for improvements to the key area (range 0–8). The y-axis presents the mean estimated feasibility and effectiveness (scale 0–10) of all included suggestions in each key area.

Implementation and Evaluation of the Intervention

Paper III

Participation in the intervention was high. Only ten participants were excluded because they had not attended to the education, and over 80% participated in the workshops. Overall, the participants were satisfied with the intervention (both the education and the workshop), perceived it as relevant to their work and reported a high degree of engagement. However, regarding the action plans that emerged during the workshops, only 31% reported a continuation of these at work. The intervention showed strong and statistically significant effects on employees' perception of changed work strategies regarding how to handle emails at follow-up 1 (6 months after baseline) (F (1,16) = 92.5, p<0.001, η^2p=0.37) and follow-up 2 (12 months after baseline) (F (1,15) = 71.9, p<0.001, η^2p=0.32); of how to structure work tasks at follow-up 1 (F (1,16) = 63.6, p<0.001, η^2p=0.29) and follow-up 2 (F (1,15) = 42.5, p<0.001, η^2p=0.22); and how to prioritize work tasks at follow-up 1 (F (1,16) = 60.1, p<0.001, η^2p=0.28) and follow-up 2 (F (1,15) = 41.2, p<0.001, η^2p=0.21). It also showed strong and significant effects on how to minimize work interruptions at follow-up 1 (F (1,16) = 37.1, p<0.001, η^2p=0.19) and follow-up 2 (F (1,15) = 27.0, p<0.001, η^2p=0.16). Table 3 presents descriptive statistics on changed work strategies at follow-up 1 and 2, in the intervention and control group. We found no statistically significant effects at follow-up 1 for work-related ICT use during non-working hours (B=-0.14, P=0.36, CI -0.43–0.16), productivity (B=0.29, P=0.27, CI -0.22–0.79), expectations of availability (B=0.10, P=0.31, CI -0.09–0.29), and clarity regarding expectations about availability (B=0.16, P=0.43, CI -0.24–0.56). Results at follow-up 2 were similar for ICT use (B=-0.11, P=0.47, CI -0.41–0.19), productivity (B=0.36, p= 0.23, CI -0.23–0.95), expectations of availability (B=0.12, P=0.22, CI-0.07–0.31), and clarity regarding expectations about availability (B=-0.12, P=0.60, CI -0.56–0.32). All models included covariates (marital status, gender, children living at home, and educational level); however, the unadjusted model (not shown) showed similar results. The sensitivity analysis performed on employees with a high degree of ICT use during non-working hours at baseline did not show any significant results.

Paper IV

Table 3. Descriptive statistics on employees' changed work strategies, presented as the mean change (standard deviation (*SD*)) at follow-up 1 (6 months follow-up) and follow-up 2 (12 months follow-up), for both the intervention and the control group. The response scale ranged from 0 = no change at all, to 4 = changed to a large extent.

Variables	**Intervention group**		**Control group**	
During the last 6 months, have you changed your work strategies regarding …	n	Mean *(SD)*	n	Mean *(SD)*
Handling emails				
Follow-up 1	94	2.7 (1.3)	66	0.8 (1.1)
Follow-up 2	96	2.4 (1.2)	56	0.7 (1.1)
Structuring work tasks				
Follow-up 1	93	2.6 (1.6)	66	1.2 (1.1)
Follow-up 2	95	2.3 (1.2)	55	1.0 (1.2)
Prioritizing work tasks				
Follow-up 1	94	2.6 (1.2)	66	1.1 (1.1)
Follow-up 2	97	2.3 (1.1)	56	1.1 (1.2)
Minimizing work interruptions				
Follow-up 1	91	2.1 (1.2)	65	0.9 (1.1)
Follow-up 2	95	1.8 (1.1)	54	0.8 (1.1)

Paper IV focused on the same intervention as presented in paper III (i.e., education and workshops to change work strategies in FWAs) but evaluated the effect on WLB, WHI and HWI. At baseline, the intervention group perceived a relatively high degree of WLB (mean 3.08, *SD* 0.90), on a 5-point scale ranging from 0 = not at all to 4 = to a very high extent, and a low degree of WHI (mean 1.23, *SD* 1.00), rated on a 5-point scale ranging from 0 = not at all to 4 = to a very high extent, and a low degree of HWI (mean 0.88, *SD* 0.89), rated on a 5-point scale ranging from 0 = not at all to 4 = to a very high extent. No statistically significant intervention effects were found at follow-up 1 (6 months after baseline) on WLB (*B*=-0.11, *CI* -0.39–0.17), WHI (*B*=-0.01, *CI* -0.28–0.25) or HWI (*B*=-0.12, *CI* -0.37–0.12). Similar results were found at follow-up 2 (12 months after baseline) for WLB (*B*=-0.25, *CI*=-0.54 to 0.05), WHI (*B*=0.01, *CI* -0.25–0.27), and HWI (*B*=-0.14, *CI* -0.43–0.15). These are the results of the adjusted model that was controlled for covariates (educational level, marital status, gender, and children living at home). However, the unadjusted model showed similar results. Nor did the sensitivity analysis, performed on employees with low WLB and high WHI at baseline, show any significant change in results. The group experiencing high HWI at baseline was too small to analyze.

Discussion

The overall aim of this thesis was to develop, implement, and evaluate a workplace intervention among office-based employees with FWAs. More specifically, the aims were to: 1) identify demands and resources related to WLB; 2) in co-creation with the investigated organization, identify suggestions for improvements to guide the development of a workplace intervention; and 3) implement and evaluate the effect of an intervention, addressing some of the identified suggestions on proximal (i.e., work strategies, ICT use, productivity, and expectations of availability) and distal outcomes (i.e., WLB and interference between work and private life).

Defining the Concepts

A considerable challenge when investigating FWAs and WLB is that both concepts are complex and have been defined in several different ways over the years (31,34,46,117). One explanation may be that societal changes have caused new traditions in FWAs and new ways of looking at WLB, which may require definitions that are consistent with the current society. For example, flextime was first implemented as an action to reduce labor shortages by introducing women into the labor market (118). Since then, working life has become more and more flexible and several new forms of FWAs have been defined (117). The same has occurred regarding the concept of WLB. By introducing women into the workforce, the concept of work-family conflict emerged. Subsequently, as gender roles changed, a more holistic perspective arose out of which the concept of WLB emerged. Thus, FWAs and WLB are evolving concepts and many similar definitions have been developed over the years (31,34,46,117). Consequently, there may be several different meanings and measurements of these concepts, which may complicate the comparison of FWAs and WLB between countries and organizations (31,34), as well as research on their relationship.

In this thesis, a general definition of FWAs was used. The definition was modified from Hill et al (3), and includes several aspects of flexibility, regarding when, where, and how the work is performed. Modifying the definition based on information about how employees perform their work, instead of how long they are engaged in work-related tasks provides an additional aspect of flexibility. Also, the definition becomes more adaptable to organizations that offer FWAs, such as non-regulated working hours, where employees can control when, where, and how they perform their work, which was the case in this thesis. However, to be critical, we also included flextime in this thesis, which is not covered by the definition in the same advantageous way, since it is less flexible and contains specific time frames for when the work should be performed. Despite this, employees with non-regulated work-

ing hours and flextime had the same opportunity to work from home (in agreement with the manager), and to control how to perform the work. Therefore, this definition of FWAs was considered most appropriate as it describes both work arrangements in this thesis.

A general definition of Work-life balance was used in this thesis, namely, "the individual perception that work and non-work activities are compatible and promote growth in accordance with an individual´s current life priorities" (34, p. 326). This is a well-established definition, covering the holistic perspective and including all aspects of life (i.e., aspects in both work and private life) (34). This definition was consistent with the question used to measure overall WLB in the included studies: "How satisfied are you with your WLB?" (67). However, a critical issue with the definition is the lack of clarification about what is a high and what is a low degree of WLB, which may cause difficulties when measuring WLB. Therefore, we modified the included question on WLB in the questionnaire (studies I and IV) to determine the extent to which employees were satisfied with their WLB. Although it may still be difficult to set a limit value for a high or low degree of WLB as the experience of WLB is quite individual.

Furthermore, WLB is a debated concept that has received some criticism (119,120,121). For example, WLB can be interpreted as a trade-off between work and life where work is not integrated with life (119,120). A fairer definition would be work-private life integration. However, this terminology has also been criticized since the development has been moving in a more positive direction, focusing on the balance between work and private life, instead of seeing these as two separate domains that compete (119). More advantageous terms would be work-private life balance or work-non-work balance, which, unfortunately, have not received as much attention in the literature as WLB. Hence, for this thesis, the well-established and generally well-understood term WLB has been used in the included studies.

Development of the Intervention

The development of the intervention has followed a structured process and important components in occupational health interventions have been considered (73,75,76,77). Based on co-creation and a participatory approach, we performed comprehensive preparatory work (studies I and II) to understand the organizational context and identify suggestions for improvements at several organizational levels. Thus, the implemented intervention activities were customized to meet the needs of both the organization and the employees.

In the first preparatory phase of the intervention (paper I), we investigated the current situation in the organization to understand the positive and negative aspects of FWAs. In line with the JD-R model (55,56), we found that WLB was associated with both job demands and job resources, in employees with FWAs. The strongest positive association with WLB was found for boundary management. This can be explained by the Boundary Theory (44), implying that employees' ability to create and maintain boundaries are crucial for achieving a good WLB (42,44). Other identified resources, such as

leadership behavior, social support from colleagues, and social community at work, were in line with previous research, indicating a positive association with WLB, although they have not previously been extensively studied in the context of FWAs (58). The strongest negative associations with WLB were found for over-commitment to work, and quantitative job demands (54). One explanation may be that both over-commitment and quantitative job demands can trigger employees to work longer hours, which steals time and energy from their private life (54). Expectations regarding availability and to work more than agreed were also negatively associated with WLB. This may be explained as a result of employees feeling compelled to respond to work-related phone calls and emails, even during evenings and annual leave, which can trigger them to work more than agreed (5). Thus, over-commitment to work, quantitative job demands, expectations of availability, and to work more than agreed can be a threat to employees' WLB in FWAs.

Drawing on the JD-R model (55,56), we found a positive association between perceived flexibility and WLB, and interaction effects of perceived flexibility on some negative associations with WLB. Hence, perceived flexibility was identified as a resource for WLB, protecting against the negative effects of expectations of availability, and to work more than agreed, as well as the negative effect of overtime work on WLB. Surprisingly, we found interaction effects of perceived flexibility on some positive associations as well, namely, information about how to organize work, structure-oriented leadership, and social support from colleagues. This implies that employees with a high degree of perceived flexibility may experience these factors as less important for achieving a good WLB. On the other hand, some positive associations with WLB were not diminished by perceived flexibility, such as boundary management, relation-oriented leadership, and a culture encouraging flexible work. These results indicate that some factors are equally important for employees' WLB, regardless of the degree of perceived flexibility.

In the second preparatory phase of the intervention (paper II), employees made suggestions for improvements to strengthen resources and reduce the demands of FWAs which had been identified in the first phase. Surprisingly, the bulk of suggestions for improvements concerned the organizational level (86%), although in paper I, the strongest associations with WLB were observed at an individual level (boundary management and over-commitment to work). One explanation may be that the suggestions for improvements were categorized based on who was responsible for implementing the suggestions for improvements: the organization, the work group, or the individual. Interestingly, similar trends emerged when focus group interviews were conducted at the managerial level (not reported in this thesis), suggesting improvements pointing towards the work groups and individual levels. This may be explained by the transtheoretical model of health behavior change (122), implying that individuals tend to prefer solutions on levels that do not require them to take responsibility for the change (122).

However, even though the organization was considered responsible for most of the improvements for employees, such as supporting managers in

adapting leadership to FWAs, or developing shared visions and organizational guidelines for FWAs, several key areas at the organizational level were directed to the individual or work group, and aimed to strengthen individual boundary management and the culture within the work group to handle job demands in FWAs more easily. These key areas included organizing work to reduce job demands and increase recovery; organizing work to increase effectiveness; improving of social community in FWAs; and strengthening the culture of respectful behavior in FWAs. Thus, categorization of the suggestions based on where they should be implemented, would probably have given a clearer picture of where improvements were needed (at the organizational- the work group-, or the individual levels).

The third phase of the project was also co-created with the organization, formulating the goals of the intervention, finding suitable activities, and deciding on the relevant outcomes (i.e., the program logic) (73). The program logic was formulated based on the results from the two preparatory phases of the project. Overall, it was possible to discern a common thread between identified demands and resources (paper I) and suggested improvements (paper II), which indicates a need to develop work strategies to strengthen the resources and reduce excessive demands in FWAs, both individually and within the work group. For example, employees suggested the need for education in personal efficiency to handle job demands more easily and facilitate detachment from work during leisure time. Also, they suggested strengthening the culture in the work group by developing clear rules and routines concerning expectations of availability.

These improvements were embedded in several key areas, which were highly rated on efficiency and feasibility, and were mentioned by almost all focus groups. The suggestions involved responsibility on all IGO levels, which is recommended in occupational health interventions (73,91). Therefore, together with the organization, we developed the intervention based on suggestions that had the potential to strengthen the resources and handle demands more easily, that were identified in paper I. The final intervention consisted of two steps: 1) education focusing on changing individual work strategies to facilitate detachment from work during leisure time; and 2) workshops focusing on developing common rules and routines for FWAs within the work group.

The program logic was underpinned by literature within the research field as well as established theories and models. For example, the intervention activities aimed to develop work strategies to strengthen resources, such as boundary management and perceived flexibility, to handle job demands more easily by creating and maintaining boundaries between work and private life, which is in line with the Boundary Theory (44). The intervention was also supported by the JD-R model, which suggests that strengthening resources can reduce job demands and predict positive outcomes (55,56). Furthermore, perceived flexibility was suggested as a protective factor against the negative effects of several job demands on WLB in paper I. According to the JD-R model, it is possible that work strategies intended to strengthen perceived flexibility can attenuate the impact of poor working conditions on WLB.

Additionally, we based out intervention to prior research suggesting that changes in work strategies are more effective than changes in working condition, in increasing detachment from work (6). In general, the intervention focused on increasing self-control by developing work strategies at both individual and work group levels. These involved strategies for self-leadership and self-leading teams, which are believed to be effective in handling job demands in FWAs (68).

Implementation Strategies

The intervention involved responsibility on all levels (individual, group, and organizational) (73,91). In addition, we planned to implement an intervention activity on an organizational level by developing a shared vision and clear guidelines for FWAs. This has emerged as an important factor for WLB in paper I and was the second largest area of improvement in paper II. Unfortunately, we could not implement activities on an organizational level, due to lack of time and resources. Implementing the intervention activities on an organizational level might have had a greater effect. Previous research indicates that clear organizational guidelines are important for the effective implementation of an FWA (123). It can be difficult to establish new work strategies at a work group and individual level if there is no shared vision and if there are no clear organizational guidelines about how to use FWAs.

However, it is likely that the intervention has been implemented with relatively high fidelity (i.e., delivered as intended) since the intervention group was highly engaged and satisfied with the intervention, and found it relevant to their work. They also reported larger changes than the control group in work strategies regarding handling emails, structuring, and prioritizing work tasks, and minimizing work interruptions, which was the intention of the education. The changed work strategies persisted even after the second follow-up which confirms the fidelity of the intervention; despite somewhat weaker effects, there still were large effect sizes. Therefore, it is likely that implementation failure (when an intervention is not implemented as expected) (124), did not occure.

Another implementation strategy that may have influenced the results is who in the organization to which the intervention was implemented. Since the overall aim of the research project was to reduce stress and work-related sick leave, we decided, together with the organization, to target the intervention to employees with a high level of stress. Based on the questionnaire in the first phase of the project, one division of the organization showed markedly high levels of stress and was therefore offered the intervention. Two departments from this division participated as intervention and control group, respectively. However, the intervention was implemented 3 years after the questionnaire was collected, and it is possible that the perceived stress levels had changed. Therefore, it would have been better to identify employees who perceived a high level of stress or otherwise poor working conditions, such as high job demands or poor WLB, closer to the intervention. However, a universal prevention strategy has been suggested to be more effective in inter-

ventions focusing on improving cognitive skills (93), and therefore it may have been beneficial to randomly select the intervention group within the organization.

Evaluation of the Intervention

After implementing the intervention activities at the work group and individual level, we wanted to investigate the effects on proximal (paper III) and distal outcomes (paper IV). We found the intervention effective in changing individual work strategies for how to handle emails, structure work tasks, prioritize work tasks, and minimize work interruptions (paper III). This may indicate that the education was delivered and received as intended (75). It is likely that the dose delivered was relatively high for the education since it was delivered by following the same schedule, had the same content, and was delivered by the same experts. The reach of the education was also high since all employees in the intervention group, except for ten employees, participated in the education. Most participants were highly engaged and satisfied with the education and perceived it as relevant to their work, which increases the likelihood that the participants received the education well. Similar results were found for the second part of the intervention (i.e., the workshops) since the participants reported a high degree of participation (84.2%), engagement, satisfaction, and relevance to their work, although the levels were somewhat lower than for the education. Also, all workshops were delivered by the same expert, within the same timeframes, and with the same content, which indicates on a high consistency and a relatively high dose delivered. These effects may have been the result of having used co-creation and a participatory approach, which customized the intervention activities based on the needs of both the organization and the employees.

Surprisingly, the effects of changed work strategies became somewhat weaker at the second follow-up, after both the education and the workshops. Theoretically, work strategies intended to better detach from work during leisure should be strengthened by common rules and routines regarding availability within the work group (1,125). One explanation for the weaker effect at the second follow-up may be that the education was more effective in changing work strategies than were the workshops, but that the effect did not persist to the same extent. Another explanation may be that the action plans, developed at the workshops, were not followed consistently. This may be because we could not provide employees additional support to sustain the learned strategies, at both an individual and a work group level, which has been reported to be important for achieving sustainable behavior change (122). Interestingly, the same pattern of improved work strategies was found in the control group, which can be explained by contamination. The intervention and the control group belonged to the same division, which may mean that they worked together to some extent. Therefore, it is likely that the changed work strategies in the intervention group spilled over to the control group. For example, if some employees change their strategies regarding

availability and when to contact each other, this may affect the behavior of the other co-workers and in other parts of the organization as well.

Unexpectedly, the intervention had no effect on other proximal outcomes than work strategies (i.e., ICT use after regular working hours, productivity, and expectations of availability), in accordance with the aims of paper III. For example, it is likely that improved work strategies in handling emails, structuring, and prioritizing work tasks, and minimizing work interruptions have the potential to reduce work-related ICT use outside regular working hours, and to improve productivity. Also, the workshops aimed to develop common rules and routines about, for example expectations of availability in FWAs. However, we did not ask whether the ICT use outside regular working hours was voluntary or not; nor did we ask about the employees' satisfaction with the use of work-related ICT. It is likely that integrators (who prefer to blend work and private life) do not feel the same need to change work strategies to increase psychological detachment from work as segmenters (prefer to separate work and private life), although previous research indicates that psychological detachment from work is equally important to segmenters as to integrators (36). It is likely that segmenters are more receptive to this kind of intervention and therefore, the intervention activities may have had greater effects on them. Unfortunately, this thesis did not investigate whether the employees wanted to separate or integrate work and private life.

In paper III, we examined the effect of the intervention on proximal outcomes, which, according to the literature, are important to influence distal outcomes, such as WLB and interference between work and private life (5,62). However, the intervention activities were not effective in improving distal outcomes. This was unexpected since the participants were highly satisfied with the intervention, perceived it as relevant to their work, and reported changed work strategies, with large effect sizes, after both the education and the workshops. Therefore, it is likely that the intervention has increased employees' self-leadership ability, both individually and as a work group (i.e., self-leading teams) (68), but without having any effect on WLB. The intervention was preceded by an explicit theory of change since it was based on co-creation and well-underpinned by established theories and models, such as Boundary Theory (44) and the JD-R model (55,56), which suggests that initiatives to strengthen job resources may make it easier to handle job demands. However, the development of the intervention also had elements of an implicit theory of change since the intervention was intended to educate employees to change their work strategies to better detach from work during leisure. Also, the development of the intervention relies on established and recommended strategies in intervention research, such as co-creation, a participatory approach, and inclusion of the IGO levels, all of which are suggested to lead to more effective interventions (73,76,80).

The unclear results of the intervention may be due to several reasons. One of these may be program/theory failure (when an intervention is successfully implemented but does not have the intended effect due to an ineffective theory) (124, p.283). Since the program logic of the research project aimed to achieve more than just WLB, the intervention activities were not specifically

designed to improve WLB, although some of the factors they targeted might in turn influence WLB. For example, decreased ICT use outside regular working hours and clarified expectations of availability are suggested to improve detachment from work during leisure, which is important for having a good WLB (5,62).

To get a broader perspective of WLB, we also included WHI and HWI, which showed the same non-significant results as WLB. Therefore, it is possible that other intervention activities would be needed to improve WLB and interference. According to previous intervention research (6), specific segmentation strategies, such as turning off emails after the workday, have been suggested to be effective in improving WLB in FWAs. Possibly having an intervention intended to reduce job demands (e.g., by reducing working hours or decreasing the workload) would more effectively lead to WLB for employees, than developing work strategies for handling job demands. However, paper I, and previous research suggest that over-commitment to work is a considerable challenge for WLB in employees with FWAs (54). Employees who are highly committed to work are likely to take work home after the workday, regardless of the degree of job demands (54). Perhaps, the expectations of availability and to responding to emails even after regular working hours may be particularly challenging for WLB among employees who are highly committed to work. Therefore, it may be a good idea to support employees in finding sustainable work strategies to preserve resources and reduce excessive demands in FWAs, alternatively in combination with improving working conditions. However, work contributes only to explaining a limited part of WLB since private life plays a significant role for achieving WLB (31). Therefore, it may be important to identify demands and resources in the private domain. This however can be difficult for an organization to address, as well as to propose intervention activities on a private level.

Another possible explanation of the non-significant result is that employees on average perceived relatively good working conditions already at baseline, in terms of low levels of ICT use outside regular working hours, low expectations of availability, and low interference between work and private life, and high levels of productivity and WLB. This might make additional improvements difficult to achieve. The good WLB may be representative of the rest of the organization, as all employees with FWAs reported relatively high WLB in paper I. Thus, including WLB in the program logic as one of the main outcomes can be arguable. One reason to include was that we found strong negative associations with WLB in paper I, such as over-commitment, quantitative job demands, overtime work, and high expectations of availability. Therefore, even though employees perceived a relatively good WLB on average, it may be important to work on promotion and prevention to maintain WLB. According to the Boundary Theory (44), employees continuously create and maintain boundaries to achieve a good WLB. It is possible that in some parts of work or life it may be more challenging to maintain a good WLB, and therefore, it may be important to establish work strategies, both individually and within the work group, to handle challenging periods more easily.

Although the effect sizes were large for changes in work strategies, all data collection in this thesis was performed before the COVID-19 pandemic, which may pose the question of whether our findings are still relevant today. Post-pandemic working life has increased flexibility, especially with regard to working from home. According to research conducted during and after the pandemic, resources and areas for improvement identified in papers I and II are particularly important for modern working life (126). They include developing an organizational policy (127), adapting the leadership to FWAs (27), strengthening the work culture, and clarifying availability within the work group (126). Also, the increase in digitalization may have introduced employees who did not use FWAs before the pandemic to work more flexibly, which may require alternative work strategies to facilitate psychological detachment from work during leisure time.

Methodological Considerations

Included papers in this thesis used various designs, namely: cross-sectional (paper I), mixed methods (paper II), and intervention design (papers III and IV). In the following section, general methodological considerations will be discussed.

Research Designs

An overall strength of this thesis was the close collaboration with the organization. By using co-creation (78), we involved a steering group consisting of members from both the University of Gävle and the organization. The steering group was responsible for formulating the overall research questions, developing the design, and performing data collection for the research project. We also formed project groups with members from both the university and the organization who were involved in detailed planning of the project, as well as reference groups who provided feedback before data collection to customize the questions for the organization. This strategy, in combination with a participatory approach, where employees were involved in identifying demands and resources and making suggestions for improvements, may have increased the chances of capturing the needs of the organization and the employees. Based on this, we developed a relevant intervention. In addition, several levels within the organization were involved in all the papers included in the thesis. This was intended to identify where, in the organization, were risk factors and where improvements needed to be implemented. It has been reported that interventions targeting several levels simultaneously (e.g., the work group and individual level) may increase the chances of true changes as the levels interact with each other (73).

Paper I had a cross-sectional design, which allowed the inclusion of several variables on multiple levels in the organization (i.e., the organizational, leadership, psychosocial, and individual level). However, a limitation of using cross-sectional designs may be the exclusion of causal associations and changes over time. All investigated factors were work-related, but it may have been relevant to include personal factors, such as family situation or

gender, as determinants of WLB. It may also have been interesting to include more dimensions of WLB, such as WHI and HWI.

Paper II had a mixed method design using focus group interviews to collect employee suggestions for improvements to the work environment and health in FWAs and estimate the effectiveness and feasibility of the suggested improvements. The strength of using focus group interviews for this purpose lies in the possibility of collecting suggestions from several departments, which may increase the chances of achieving broad organizational representation. Also, interaction between participants can result in new insights and ideas. However, focus group interviews can have limitations, for example, it can be difficult to get all participants involved in the discussion, and there is also a risk that only a few participants' opinions will be heard during the discussions (128). To prevent this, moderator steered the discussion ensuring that all participants were able to express their opinion. Also, there were many suggestions for improvements that recurred in several focus group interviews, which indicates that there was a consensus on ideas for improvement.

Papers III and IV were based on a workplace intervention. The main strength of these studies was their longitudinal design, allowing for measurements at three time points: before the intervention (baseline), after the education (6 months follow-up), and after the workshop (12 months follow-up). This made it possible to evaluate each step of the intervention. Also, the controlled design allowed comparisons with a group that was comparable in size, work tasks, and work flexibility, but did not receive the intervention. One of our limitations was the non-randomized design. This was however not feasible, as we targeted departments instead of individuals. Another limitation was that the intervention could not provide follow-up education and workshops. Follow-ups could have supported employees in maintaining the new strategies, either individually or as a work group. According to previous research (122), a new behavior should be maintained for at least 6 months to achieve sustainable behavior change. Therefore, it may be beneficial to support the participants in maintaining the new strategies after the intervention, and to evaluate long-term behavioral change. A possible limitation of the intervention design is that it did not include a formal process evaluation. This excludes the possibility of considering other changes in the organization that may have affected the results of the intervention.

Population

The included samples in the thesis consisted of office-based employees with non-regulated working hours or flextime, employed at the organization. All employees with FWAs were included, although the types of FWAs differed in degree of flexibility. However, employees with non-regulated working hours and flextime could both control how they worked and had the opportunity to work from home. The main difference between these types of FWAs is that employees with flextime need to work within certain time frames, while employees with non-regulated working hours have greater autonomy in deciding when they work. One limitation of including both types of FWAs in

this thesis may be that flextime, in general, is more positively associated with WLB than other forms of FWAs (48). Therefore, employees with flextime may experience less need to change their work strategies to improve their WLB, which may have affected the results of the intervention in paper IV. Moreover, employees with flextime may not experience the same degree of availability outside regular working hours, and therefore, they may not have the same need to develop common rules and routines for FWAs. However, in the intervention studies (papers III and IV), only 12.5% in the intervention group and 7.8% in the control group had flextime. The same pattern was seen in papers I and II, where the proportion of employees with non-regulated working hours was predominant.

In paper I, all employees, and managers with FWAs received the questionnaire (n=4,900). One strength of this study was the high response rate (66.5%) and the large sample (n=2,960 participants included after the exclusion criteria were applied), which may increase the generalizability within the organization. However, we only included one organization, which limits the generalizability and comparability with other organizations that offer FWAs.

In paper II, 45 employees participated in the focus group interviews, divided into eight groups at the departmental level. Conducting the interviews at the department level may have resulted in the participants knowing each other, which can create a feeling of a safe environment to confidently express their opinions. On the other hand, knowing each other, might have reinforced existing roles within the group. This may result that individuals who are used to making their voices heard and getting their proposals through also dominated the interviews. However, there were only three to eight participants per group that came from a large department containing several different units, located in different geographic locations, therefore this risk was minimal.

In papers III and IV, the intervention group comprised 97, and the control group had 70 employees. A considerable limitation of these studies is that due to an error in the data collection procedure, 56 participants from the control group were excluded. Thus, the control group ended up fairly small, which negatively affected the power and representativeness of the studies. Furthermore, the two departments that constituted the intervention and control groups belonged to a division selected by the researchers, the HR department, and the top management of the organization, and were selected due to their markedly higher levels of stress, which was reported by the work environment and health questionnaire in 2016. However, the intervention was implemented 3 years after the questionnaire, and the perceived stress levels may have changed over the years. It may also have been relevant to select participants based on other outcomes such as high job demands or poor WLB, which may be facilitated by changing work strategies, both individually and within the work group.

Measurements

Paper I comprised a comprehensive questionnaire allowing measurements of several occupational factors in relation to WLB. We used established and previously validated questions to examine most of the investigated variables,

such as psychosocial factors (COPSOQ) (104), leadership behaviors (101,102,103), over-commitment (105) and boundary management (106). However, it was not possible to consistently use established questions to capture relevant factors in FWAs. Therefore, we asked customized questions to examine factors, such as organizational guidelines for FWAs, expectations of availability outside regular working hours, and work cultures that encourage FWAs. This questionnaire was validated using PCA (129), and "think-aloud interviews" were conducted with the reference group from the organization (unpublished data).

One possible limitation of the questionnaire is that WLB was measured by one single item, which was adapted from Hanson (67). After feedback from the organization's reference group, the original question was changed from "Are you currently satisfied with your life situation in terms of the balance between work and private life?" to "How satisfied are you with your WLB?" as it was perceived to be easier to understand. Also, the response scale was changed from 1 = absolutely not to 5 = absolutely, in the original question (67), to 0 = not at all to 4 = to a very high extent. These changes were made to facilitate participants' understanding, as well as the interpretation of the extent of perceived WLB. However, a WLB index would have been beneficial to capture a more comprehensive assessment of the concept. Another option could have been to include more aspects of WLB, such as asking about satisfaction with work, and in a separate question asking about satisfaction with private life, in accordance with Hanson (67). Alternatively, we could have included WHI and HWI, as in paper IV.

In paper I, perceived flexibility was measured by an index including all three aspects of flexibility (when, where, and how to perform the work). This means that it was not possible to deduce whether any one aspect (e.g., flexibility in time) affected WLB more in comparison with the other aspects, which is a limitation of the study. Also, the index only measured whether employees had the ability to control when, where, and how to work, not the extent to which they truly worked flexibly. Addressing employees' objective work flexibility could have been an important addition.

In paper II, by using a tree diagram, we asked one single question in the focus group interviews to collect employees' suggestions for improvements, namely, "What interventions do you perceive as most important to promote a good work environment and health in FWAs?" This is a well-established method that is commonly used in quality improvement work (107). This method enables the group to be active and creative, by practically building a tree of notes (suggestions) where one question systematically breaks down into main themes, sub-themes, and finally, concrete suggestions. Thus, participants can see the results of the discussion during the process, allowing for continuous changes and additions. Another strength of this methodological tool is that all participants can prioritize suggestions from the tree diagram by estimating how feasible each suggestion is, and how effective a suggestion is in promoting a good working environment and health in FWAs.

In papers III and IV, a shorter version of the work environment and health questionnaire from 2016 was used to examine the effects of the intervention.

Thus, even these papers, a combination of established and customized questions were used. Some additional questions about the experience of the intervention were included in the follow-up measurements. Moreover, questions on whether the employees had changed their work strategies regarding how to handle emails, structure work tasks, prioritize work tasks, and minimize work interruptions after both the education and the workshops were added to the follow-up questionnaires and were evaluated in paper III. One possible limitation of these questions was that we only asked whether the employees had changed their work strategies, not whether they perceived the changes as positive, negative and if they continued to use these new strategies. It could also have been beneficial to include further questions about changing work strategies, to evaluate the effects of the intervention. For example, the included questions about changed work strategies mainly focused on the content of the education. It could have been beneficial to assess how work strategies that were more specific to the content of the workshops changed, such as changed work culture regarding when and how employees contacted each other. It could further have been informative to conduct additional interviews with participants from the intervention group, to gain a more comprehensive and deeper understanding of their experience of the intervention and how it had affected their work strategies (or, if it had not had this effect, what would need to be done differently to achieve a change).

Lastly, in paper IV, we faced the same limitations as in paper I regarding measuring WLB with one single item. However, paper IV included more dimensions of WLB in terms of interference between work and private life, to gain a broader perspective of the intervention effect on WLB. Despite this, WLB may be viewed as a distal outcome that needs time to change, and it may be relevant to also include some proximal outcomes relevant to WLB, such as boundary management or psychological detachment from work during leisure time.

Data Analysis

Overall, analytical methods were carefully considered for the focused research question in specific studies and for the distribution of the data. We controlled for possible covariates in all quantitative analyzes (papers I, III, and IV), based on theory and previous literature about important factors in FWAs that may affect employees' WLB, such as children living at home, marital status, age, gender, and educational level. In study I, we included all employees with FWAs, and controlled for position in the organization (manager or employee), as the degree of flexibility and perceived job demands and resources may differ between managers and employees.

Paper I consisted of a large sample (n=2,960), which allowed the inclusion of several independent variables and covariates. To choose which variables to include, we first selected all occupational variables and indexes with a possible relation to WLB, in accordance with previous literature. This first step resulted in many variables, which motivated a statistical analysis of variable selection. Thus, we performed factor analysis to reduce similar variables. Based on the factor analysis, six variables were excluded because of

their high correlation with other variables. Although some other variables such as social support, and social community at work were highly correlated, they were still included in the study. This decision was made because they were established questions, that have previously been used together (104) and were suggested predictors for WLB (30). Thus, we ended up with 19 independent variables. We used separate multiple linear regression models for all independent variables. An alternative approach could have been to include all predictors simultaneously in a larger model. However, due to the risk of correlations between the variables, which can lead to misleading results, such analyzes was not performed. Furthermore, we adjusted for possible covariates in all regression models. Selecting covariates can be challenging, as well as capturing the risk of residual confounding. However, our aim was not to identify causal relationships, but instead to document demands and resources relevant for developing interventions to improve WLB. Furthermore, a strength of having a large sample is that it makes it possible to detect interactions that often have smaller effect sizes.

In paper II, using a tree diagram led to concrete and specific suggestions to improve the work environment and health in FWAs. According to Klefsjö et al., (107), there is no established method for analyzing the result of tree diagrams**,** however, from the 279 suggestions from all focus group interviews, emerged a systematic categorization, conveying clear result.

In papers III and IV, we used LMMs for repeated measurements to analyze the effect of the intervention on proximal and distal outcomes. All participants who did not attend the first part of the intervention (i.e., the education) were excluded from the dataset. However, employees who participated in the education but not in the workshop were included, which created missing data. Linear mixed models were deemed to be an appropriate analysis method as this method is robust and flexible for missing values, and accounts for variability among participants (130).

Conclusions and Future Research

The overall aim of this thesis was to develop, implement, and evaluate a workplace intervention among office-based employees with flexible work arrangements. By using co-creation and a participatory approach, we performed comprehensive preparatory work, to determine job demands and job resources in flexible work arrangements, and to collect suggestions for improvements. Based on these results, we developed and implemented a workplace intervention to meet the needs of both the organization and the employees. Our findings showed that boundary management and information about how to organize work were considered important resources for employees' work-life balance. Furthermore, perceived flexibility (i.e., control over when, where, and how to perform the work), was a resource for work-life balance, which interacted with several demands and buffering their negative associations with work-life balance. By contrast, over-commitment to work, quantitative job demands, overtime work, and expectations of availability outside regular working hours showed strong negative associations with work-life

balance. The employees suggested work strategies, both for them as individuals and for their work group, to strengthen resources and reduce excessive demands in flexible work arrangements. This preparatory work informed the design of the intervention, which resulted in an education to improve psychological detachment from work during leisure, and workshops to create common rules and routines about flexibility within the work group. The development of the intervention was underpinned by established theories and models, such as Boundary Theory and the Job Demands-Resources model, as well as recommended intervention strategies, such as co-creation, participatory approach, and to target the intervention at several levels (i.e., organizational, work group, and individual).

The participants were highly satisfied with both intervention activities (i.e., education and workshops) and reported changed work strategies post-intervention. However, the intervention was unsuccessful in influencing work-life balance, the use of work-related information and communication technology after regular working hours, productivity, and expectations of availability. These result may have several explanations, including that: 1) the program logic of the research project targeted more outcomes than this thesis aimed for, which means that the intervention was not specifically designed to improve work-life balance; 2) we did not implement activities at the organizational level, which could have been an important addition to the implemented activities at work group and individual level; and 3) the working conditions at baseline were reported as good, which made further improvements difficult. However, even though the intervention was not effective in improving selected outcomes, the changed work strategies showed large effect sizes after the intervention and were also highly requested in the focus group interviews, as a solution to strengthen the resources and reduce excessive demands in flexible work arrangements. Therefore, developing work strategies, both individually and within the work group, may be important in organizations offering flexible work arrangements.

However, since flexible work arrangements are generally a desirable work form that is likely to remain in the future, it is important for further intervention studies to improve work-life balance in flexible work arrangements. Further research should focus on interventions that target both implicit and explicit theories of change, with awareness of possible underlying factors that may affect the process of change (Wijk & Mathiassen, 2011). Also, further interventions should be developed specifically to improve WLB. For example, it may be important to focus intervention activities on over-commitment to work, which emerged (paper I) as a considerable challenge for achieving work-life balance in employees with flexible work arrangements. Also, further intervention studies should develop, implement, and evaluate intervention activities on several levels in the organization. Initiatives on an organizational level, to clarify a shared vision and common guidelines for flexible work arrangements, may be a prerequisite to succeed with improvements at work group and individual levels. However, it may be important to understand different organizational contexts, cultures, and work strategies in flexible work arrangements for further work with co-created research. Finally,

further research should examine the long-term health effects of interventions intended to improve work-life balance in flexible work arrangements.

Practical Implications

In this thesis, we present how a workplace intervention can be developed, implemented, and evaluated to improve WLB among office-based employees with FWAs. This knowledge is valuable for organizations for systematic work improvements, regardless of the types of FWAs they adopt. Our findings indicate that organizations should involve their employees in identifying demands and resources, and collect suggestions for improvements to customize an intervention, based on the needs of the organization and the employees. Additionally, intervention activities can be implemented at several levels (i.e., organizational, work group, and individual), and improvements within one level may interact and influence other levels within an organization.

Overall, it is hoped that the findings of this thesis will make important contributions to FWAs in the investigated organization, but also for organizations offering FWAs in general. By contributing knowledge about job demands and resources in FWAs, we hope to aid organizations to understand which factors make it challenging for employees with FWAs to achieve a good WLB. Our findings present concrete suggestions for improvements, for a better work environment and health in FWAs. We found a common thread between identified job demands and resources, and suggestions for improvements, indicating that organizations may support employees in finding suitable work strategies, both individually and as work groups, to improve their WLB. The suggestions for improvements were categorized on organizational, work group and individual levels. They were evaluated based on efficiency and feasibility, which is hoped to guide organizations in choosing which improvements may be important and where they should be implemented. Therefore, it is hoped that the results of this thesis can help organizations in providing their employees support in developing sustainable work strategies in FWAs, and in supporting work groups to develop action plans containing common rules and routines for FWAs.

References

1. Johnson A, Dey S, Nguyen H, Groth M, Joyce S, Tan L, Glozier N, Harvey SB. A review and agenda for examining how technology-driven changes at work will impact workplace mental health and employee well-being. Australian Journal of Management, 2020;45(3), 402–424. https://doi.org/10.1177/0312896220922292
2. Shiri R, Turunen J, Kausto J, Leino-Arjas P, Varje P, Väänänen A. The Effect of Employee-Oriented Flexible Work on Mental Health: A Systematic Review. Healthc. 2022;10(5):883. https://doi.org/10.3390/healthcare10050883.
3. Hill E, Grzywacz JG, Allen S, Blanchard VL, Matz-Costa C, Shulkin S. Defining and conceptualizing workplace flexibility. Community Work and Family. 2008;11(2):149–63. https://doi.org/10.1080/13668800802024678
4. Kumar S, Sarkar S, Chahar B. A systematic review of work-life integration and role of flexible work arrangements. International Journal of Organizational Analysis. 2021. https://doi.org/10.1108/IJOA-07-2021-2855
5. Schlachter S, McDowall A, Cropley M, Inceoglu I. Voluntary Work-related Technology Use during Non-work Time: A Narrative Synthesis of Empirical Research and Research Agenda. International Journal of Management Reviews. 2018;20(4):825–46. https://doi.org/10.1111/ijmr.121656.
6. Karabinski T, Haun VC, Nübold A, Wendsche J, Wegge J. Supplemental Material for Interventions for Improving Psychological Detachment From Work: A Meta-Analysis. Journal of Occupational Health Psychology. 2021;26(3):224–42. https://doi.org/10.1037/ocp0000280
7. Orishede F, Ndudi F. Flexible Work Arrangement and Employee Performance: A Review. Journal of Resources & Economic Development. 2020;3(1):56–62. Available from: https://www.researchgate.net/publication/354682319. [Accessed12th September 2023].
8. Costa G, Åkerstedt T, Nachreiner F, Baltieri F, Carvalhais J, Folkard S. Flexible working hours, health, and well-being in Europe: Some considerations from a SALTSA project. The Journal of Biological and Medical Rhythm Research. 2009;21(6):831–44. https://doi.org/10.1081/CBI-200035935
9. Eurofound. Telework and ICT-Based Mobile Work: Flexible Working in the Digital Age [Internet]. Publications Office of the European Union. 2020. 66 p. Available from: www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_

document/ef19032en.pdf. [Accessed12th September 2023].
10. Ottosson M, Rosengren C. Who can you trust ? The Swedish Confederation for Professional Employees (TCO) and trust-based working time 1950-1970. Management revue - Socio-Economic Studies, Nomos Verlagsgesellschaft mbH & co. KG, vol.26(1), p. 52-68. https://doi.org/10.5771/0935-9915-2015-1-52
11. Lunde LK, Fløvik L, Christensen JO, Johannessen HA, Finne LB, Jørgensen IL. The relationship between telework from home and employee health: a systematic review. BMC Public Health. 2022;22(1):1–14. https://doi.org/10.1186/s12889-021-12481-2
12. Allen TD, Golden TD, Shockley KM. How effective is telecommuting? Assessing the status of our scientific findings. Psychological Science in the Public Interest, 16(2), 40–68. https://doi.org/10.1177/1529100615593273
13. Athanasiadou C, Theriou G. Telework: systematic literature review and future research agenda. Heliyon. 2021;7(10):e08165. https://doi.org/10.1016/j.heliyon.2021.e08165
14. Charalampous M, Grant CA, Tramontano C, Michailidis E. Systematically reviewing remote e-workers' well-being at work: a multidimensional approach. European Journal of Work Organizational Psychology. 2019;28(1):51–73. https://doi.org/10.1080/1359432X.2018.1541886
15. Allvin M, Mellner C, Movitz F, Aronsson G. The Diffusion of Flexibility: Estimating the Incidence of Low-Regulated Working Conditions. Nordic Journal of Working Life Studies. 2013;3(3):99–116. https://doi.org/10.19154/njwls.v3i3.3013
16. Statistics Sweden. Women and men in Sweden. 2020. Available from:https://www.scb.se/contentassets/1fbf4f9815374356a786278faca6a7f0/le0201_2021b22_x10br2202.pdf. [Accessed12th September 2023].
17. Kotera Y, Vione KC. Psychological impacts of the new ways of working (NWW): A systematic review. International Journal of Environmental Research and Public Health. 2020;17(14):1–13. https://doi.org/10.3390/ijerph17145080
18. Hayman JR. Flexible work arrangements: Exploring the linkages between perceived usability of flexible work schedules and work/life balance. Community Work & Family. 2009;12(3):327–38. https://doi.org/10.1080/13668800902966331
19. Richman AL, Civian JT, Shannon LL, Hill JE, Brennan RT. The relationship of perceived flexibility, supportive work-life policies, and use of formal flexible arrangements and occasional flexibility to employee engagement and expected retention. Community Work & Family. 2008;11(2):183–97. https://doi.org/10.1080/13668800802050350
20. Hill JE, Hawkins AJ, Ferris M, Weitzman M. Finding an extra day a week: The positive influence of perceived job flexibility on work and family life balance. Family Relations. 2001;50(1):49–58.

https://doi.org/10.1111/j.1741-3729.2001.00049.x
21. Heiden M, Hallman DM, Svensson M, Mathiassen SE, Svensson S, Bergström G. Mismatch between actual and preferred extent of telework: cross-sectional and prospective associations with well-being and burnout. BMC Public Health. 2023;23(1):1–11. https://doi.org/10.1186/s12889-023-16683-8
22. Stich JF. Flexible working and applicant attraction: a person–job fit approach. Personnel Review. 2021;50(1):358–78. https://doi.org/10.1108/PR-12-2019-0672
23. Bouzol-Broitman B, Thévenon O, Adema W, Clarke C. Be Flexible! Background brief on how workplace flexibility can help European employees to balance work and family. OECD, 2016;(September). Available from: https://www.oecd.org/els/family/Be-Flexible-Backgrounder-Workplace-%0AFlexibility.pdf. [Accessed15th May 2023].
24. Plantenga J, Remery C. Flexible working time arrangements and gender equality. Publications Office of the European Union. 2010. 128 p. Available from: http://llrc.mcast.edu.mt/digitalversion/Table_of_Contents_135508.pdf. [Accessed15th May 2023].
25. Zuppo CM. Defining ICT in a Boundaryless World: The Development of a Working Hierarchy. International Journal of Managing Information Technology. 2012;4(3):13–22. https://doi.org/10.5121/ijmit.2012.4302
26. Eurostatistics. Flexibility at work - Statistics. 2019. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Flexibility_at_work_-_statistics#Employers_and_clients_mainly_decide_on_working_time_in_Europe. [Accessed 27th June 2023].
27. Contreras F, Baykal E, Abid G. E-Leadership and Teleworking in Times of COVID-19 and Beyond: What We Know and Where Do We Go. Frontiers in Psychology. 2020;11:1–11. https://doi.org/10.3389/fpsyg.2020.590271
28. Shahzad MU. Impact of Flexible Work Arrangements on Work Engagement in Post COVID 19 Scenario: A Case of Technology Focused Entrepreneurial Firms. Journal of Entrepreneurship and Business Venturing. 2023;3(1):100-18. https://doi.org/10.56536/jebv.v3i1.30
29. Kühner C, Rudolph CW, Derks D, Posch M, Zacher H. Technology-assisted supplemental work : A meta-analysis. Journal of Vocational Behavior. 2023;142:103861. https://doi.org/10.1016/j.jvb.2023.103861
30. Galea C, Houkes I, De Rijk A. An insider's point of view: how a system of flexible working hours helps employees to strike a proper balance between work and personal life. The International Journal of Human Resource Management. 2014;25(8):1090–111. https://doi.org/10.1080/09585192.2013.81686231.

31. Rashmi K, Kataria A. Work–life balance: a systematic literature review and bibliometric analysis. International Journal of Sociology and Social Policy. 2021;1028–65. https://doi.org/10.1108/IJSSP-06-2021-0145
32. Lewis S, Cooper CL. The work-family research agenda in changing contexts. Journal of Occupational Health Psychology. 1999;4(4):382–93. https://doi.org/10.1037//1076-8998.4.4.382
33. Lewis S, Gambles R, Rapoport R. The constraints of a "work-life balance" approach: An international perspective. International Journal of Human Resource Management. 2007;18(3):360–73. https://doi.org/10.1080/09585190601165577
34. Kalliath T, Brough P. Work–life balance: A review of the meaning of the balance construct. Journal of Management Organization. 2008;14: 323–32. https://doi.org/10.5172/jmo.837.14.3.323
35. Greenhaus JH, Beutell NJ. Sources of Conflict Between Work and Family Roles. The Academy Managment Review. 1985;10(1):76–88. https://doi.org/10.2307/258214
36. Althammer SE, Reis D, Van der Beek S, Beck L, Michel A. A mindfulness intervention promoting work–life balance: How segmentation preference affects changes in detachment, well-being, and work–life balance. Journal of Occupational and Organzational Psychology. 2021;94(2):282–308. https://doi.org/10.1111/joop.12346
37. Hamilton Skurak H, Malinen S, Näswall K, Kuntz JC. Employee wellbeing: The role of psychological detachment on the relationship between engagement and work–life conflict. Economic and Industrial Democracy. 2021;42(1):116–41. https://doi.org/10.1177/0143831X17750473
38. Mellner C, Osika W, Niemi M. Mindfulness practice improves managers' job demands-resources, psychological detachment, work-nonwork boundary control, and work-life balance – a randomized controlled trial. International Journal of Workplace Healt Management. 2022;15(4):493–514. https://doi.org/10.1108/IJWHM-07-2021-0146
39. Pansini M, Buonomo I, De Vincenzi C, Ferrara B, Benevene P. Positioning Technostress in the JD-R Model Perspective: A Systematic Literature Review. Healthcare. 2023;11(3). https://doi.org/10.3390/healthcare11030446
40. Sonnentag S, Fritz C. Recovery from job stress: The stressor-detachment model as an integrative framework. Journal of Organizational Behavior. 2014;36:72–103. https://doi.org/10.1002/job.1924
41. Hassan J, Batra M. Work-Life Balance and Subjective Well-Being: Role of Social Support and Psychological Detachment. International Journal of Management. 2014;2(4):133–50.
42. Mellner C, Aronsson G, Kecklund G. Boundary Management Preferences, Boundary Control, and Work-Life Balance among Full-

Time Employed Professionals in Knowledge-Intensive, Flexible Work. Nordic Journal of Working Life Studies. 2014;4(4):7. https://doi.org/10.19154/njwls.v4i4.4705
43. Ashforth BE, Kreiner GE, Fugate M. All in a day's work: Boundaries and micro role transitions. Academy of Management Review. 2000;25(3):472–91. https://doi.org/10.2307/259305
44. Allen TD, Cho E, Meier LL. Work–Family Boundary Dynamics. Annual Review of Organizational Psychology and Organizational Behavior. 2014;1(1):99–121. https://doi.org/10.1146/annurev-orgpsych-031413-091330
45. Allen TD, Merlo K, Lawrence RC, Slutsky J, Gray CE. Boundary Management and Work-Nonwork Balance While Working from Home. Applied Psychology. 2021;70(1):60–84. https://doi.org/10.1111/apps.12300
46. Sirgy MJ, Lee D-J. Work-Life Balance: an Integrative Review. Applied Research in Quality of Life. 2017;13:229–54. https://doi.org/10.1007/s11482-017-9509-8
47. De Menezes LM, Kelliher C. Flexible working and performance: A systematic review of the evidence for a business case. International Journal of Management Reviews. 2011;13(4):452–74. https://doi.org/10.1111/j.1468-2370.2011.00301.x
48. Shifrin NV, Michel JS. Flexible work arrangements and employee health: A meta-analytic review. Work Stress. 2021;0(0):1–26. https://doi.org/10.1080/02678373.2021.1936287
49. Antai D, Oke A, Braithwaite P, Anthony DS. A 'balanced' life: Work-life balance and sickness absence in four Nordic countries. International Journal of Occupational Environmental Medicine. 2015;6(4):205–22. https://doi.org/10.15171/ijoem.2015.667
50. Hagqvist E, Lidwall U, Leineweber C. Is work-life interference a risk factor for sickness absence? A longitudinal study of the Swedish working population. European Journal of Public Health. 2022;32(3):398–401. https://doi.org/10.1093/eurpub/ckac028
51. James A. Work-Life "Balance", Recession and the Gendered Limits to Learning and Innovation (Or, Why It Pays Employers To Care). Gender, Work and Organization. 2014;21(3):273–94. https://doi.org/10.1111/gwao.12037
52. Zhao L, Wu L. How does digital office affect overtime through job autonomy in China? A nonlinear mediating model for the autonomy paradox. Technology in Society. 2023;72:102181. https://doi.org/10.1016/j.techsoc.2022.102181
53. Albrecht SC, Kecklund G, Tucker P, Leineweber C. Investigating the factorial structure and availability of work time control in a representative sample of the Swedish working population. Scandnavian Journal of Public Health. 2016;44(3):320–8. https://doi.org/ 10.1177/1403494815618854
54. Kinman G, Jones F. A life beyond work? job demands, work-life balance, and wellbeing in UK Academics. Journal of Human

Behavior Social Environment. 2008;17(1–2):41–60. https://doi.org/10.1080/10911350802165478
55. Bakker AB, Demerouti E. The Job Demands-Resources model: State of the art. Journal of Managerial Psychology. 2007;22(3):309–28. https://doi.org/10.1108/02683940710733115
56. Demerouti E, Nachreiner F, Bakker AB, Schaufeli WB. The job demands-resources model of burnout. Journal of Applied Psychology. 2001;86(3):499–512. https://doi.org/10.1108/02683940710733115
57. Bakker AB, Demerouti E. Job Demands-Resources Theory. In: Chen, P.Y. and Cooper, C.L., Eds., Work and Wellbeing: A complete Reference Guide, John Wiley & Sons, New York, 2014:1-28. http://dx.doi.org/10.1002/9781118539415.wbwell019
58. Haar JM, Sune A, Russo M, Ollier-Malaterre A. A Cross-National Study on the Antecedents of Work–Life Balance from the Fit and Balance Perspective. Social Indicators Researh. 2019;142(1):261–82. https://doi.org/10.1007/s11205-018-1875-6
59. Valcour M. Work-Based Resources as Moderators of the Relationship Between Work Hours and Satisfaction With Work-Family Balance. Journal of Applied Psychology. 2007;92(6):1512–23. https://doi.org/10.1037/0021-9010.92.6.1512
60. Mazzetti G, Vignoli M, Schaufeli WB, Guglielmi D. Work addiction and presenteeism: The buffering role of managerial support. International Journal of Psychology. 2019;54(2):174–9. https://doi.org/10.1002/ijop.12449.
61. Johnston K, Tanwar J, Pasamar S, Van Laar D, Bamber Jones A. Blurring boundaries: work-life balance and unbounded work in academia. The role of flexibility, organisational support and gender. Labour & Industy a journal of the social and economic relations of work. 2022;32(2):139–55. https://doi.org/10.1080/10301763.2022.2081902
62. Mellner C. After-hours availability expectations, work-related smartphone use during leisure, and psychological detachment: The moderating role of boundary control. International Journal of Workplace Health Management. 2015;9(2):146–64. https://doi.org/10.1108/IJWHM-07-2015-0050
63. Siegrist J. A theory of occupational stress. In J. Dunham (Ed.), Stress in the workplace: Past, present and future (pp. 52–66). Whurr Publishers. Available from: http://psycnet.apa.org/record/2002-02218-004. [Accessed 27th June 2023].
64. Kinman G, Jones F. Effort-reward imbalance, over-commitment and work-life conflict: Testing an expanded model. Journal of Managerial Psychology. 2008;23(3):236–51. https://doi.org/10.1108/02683940810861365
65. Kinman G, McDowall, A. (2009) Does work/life balance depend on where and how you work? Ewop in Practice. 2009;9:1–11. https://doi.org/10.21825/ewopinpractice.87060

66. Grant A.M, Schwartz B. Too much of a good thing. Perspectives on Psychological Science. 2011;6(1):61–76. https://doi.org/10.1177/1745691610393523
67. Hanson M. Det flexibla arbetets villkor – om självförvaltandetskompetens. Arbetsliv i omvandling. Ph.D. Thesis, Stockholm University, Stockholm, Sweden, August 2004.
68. Stewart GL, Courtright SH, Manz CC. Self-leadership: A multilevel review. Journal of Management. 2011;37(1):185–222. https://doi.org/10.1177/0149206310383911
69. Bäcklander G, Rosengren C, Kaulio M. Managing intensity in knowledge work: Self-leadership practices among Danish management consultants. Journal of Management & Organization. 2021;27(2):342–60. https://doi.org/10.1017/jmo.2018.64
70. Fox KE, Johnson ST, Berkman LF, Sianoja M, Soh Y, Kubzansky LD, Kelly EL. Organisational- and group-level workplace interventions and their effect on multiple domains of worker well-being: A systematic review. Work & Stress. 2021;0(0):1–30. https://doi.org/10.1080/02678373.2021.1969476
71. Brough P, O'Driscoll MP. Organizational interventions for balancing work and home demands: An overview. Work & Stress. 2010;24(3):280–97. https://doi.org/10.1080/02678373.2010.506808
72. Michel A, Bosch C, Rexroth M. Mindfulness as a cognitive-emotional segmentation strategy: An intervention promoting work-life balance. Journal of Occupational and Organizational Psychology. 2014;87(4):733–54. https://doi.org/10.1111/joop.12072
73. Von Thiele Schwarz U, Nielsen K, Edwards K, Hasson H, Ipsen C, Savage C. How to design, implement and evaluate organizational interventions for maximum impact: the Sigtuna Principles. European Journal of Work and Organizational Psychology. 2021;30(3):415–27. https://doi.org/10.1080/1359432X.2020.1803960
74. Nielsen K, Abildgaard JS. Organizational interventions: A research-based framework for the evaluation of both process and effects. Work & Stress. 2013;27(3):278–97. https://doi.org/10.1080/02678373.2013.812358
75. Nielsen K, Randall R. Opening the black box: Presenting a model for evaluating organizational-level interventions. European Journal of Work and Organizational Psychology. 2013;22(5):601–17. https://doi.org/10.1080/1359432X.2012.690556
76. Nielsen K, Randall R, Holten AL, González ER. Conducting organizational-level occupational health interventions: What works? Work & Stress. 2010;24(3):234–59. https://doi.org/10.1080/02678373.2010.515393
77. Skivington K, Matthews L, Simpson SA, Craig P, Baird J, Blazeby JM. A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. The BMJ. 2021;374(2018):1–11. https://doi.org/10.1136/bmj.n2061
78. Jackson CL, Greenhalgh T. Co-creation: a new approach to

optimising research impact? The Medical Journal of Australia. 2015;203(7):283–5. https://doi.org/10.5694/mja15.00219
79. Wilson JR. Ergonomics and participation. In: Wilson J.R & Corlett E.N, editors. Evaulation of human work. 2. ed. Evaluation of human work (2nd ed). United States: CRC-Press; 1995.
80. Van Eerd D, Cole D, Irvin E, Mahood Q, Keown K, Theberge N. Process and implementation of participatory ergonomic interventions: A systematic review. Ergonomics. 2010;53(10):1153–66. https://doi.org/10.1080/00140139.2010.513452
81. Cedstrand E. Evaluating Occupational Health Interventions: Design, Implementation, and Effects. Ph.D Thesis, Karolinska Institutet, Stockholm, Sweden, January 2023.
82. Amirul SR, Shaari SC. An Overview: Twenty Years of Flexible Working Arrangements. Advances in Business Research International Journal. 2021;7(2):27. https://doi.org/10.24191/abrij.v7i2.14770
83. Wijk K, Mathiassen SE. Explicit and implicit theories of change when designing and implementing preventive ergonomics interventions - a systematic literature review. Scandinavian Journal of Work, Environment & Health. 2011;37(5):363–75. https://doi.org/10.2307/23064897
84. Jensen PL. Human factors and ergonomics in the planing of production. International Journal of Industrial Ergonomics. 2002;29:235–8. https://doi.org/10.1016/S0169-8141(01)00056-7
85. Havermans BM, Schelvis RMC, Boot CRL, Brouwers EPM, Anema JR, Van der Beek AJ. Process variables in organizational stress management intervention evaluation research: A systematic review. Scandinavian Journal of Work, Environment & Health. 2016;42(5):371–81. https://doi.org/10.5271/sjweh.3570
86. Kristensen TS. Intervention studies in occupational epidemiology. Occupational Environmental Medicine. 2005;62(3):205–10. https://doi.org/10.1136/oem.2004.016097
87. Nielsen K, Miraglia M. What works for whom in which circumstances? On the need to move beyond the 'what works?' question in organizational intervention research. Human Relations. 2017;70(1):40–62. https://doi.org/10.1177/0018726716670226
88. Gray P, Senabe S, Nisha Naicker, Spo Kgalamono AY, Spiegel JM. Workplace-based organizational interventions promoting mental health and happiness among healthcare workers. A realist review. International Journal of Environmental Research and Public Health. 2022;44(2):12–20. https://doi.org/10.3390/ijerph16224396
89. Montano D, Hoven H, Siegrist J. Effects of organisational-level interventions at work on employees' health: A systematic review. BMC Public Health [Internet]. 2014;14(1):1–9. https://doi.org/10.1186/1471-2458-14-135
90. Murta SG, Sanderson K, Oldenburg B. Process evaluation in occupational stress management programs: A systematic review.

American Journal of Health Promotion. 2007;21(4):248–54. https://doi.org/10.4278/0890-1171-21.4.248
91. Nielsen K, Yarker J, Munir F, Bültmann U. IGLOO: An integrated framework for sustainable return to work in workers with common mental disorders. Work & Stress. 2018;32(4):400–17. https://doi.org/10.1080/02678373.2018.1438536
92. Dellve L, Eriksson A. Health-Promoting Managerial Work: A Theoretical Framework for a Leadership Program that Supports Knowledge and Capability to Craft Sustainable Work Practices in Daily Practice and During Organizational Change. Societies. 2017;7(2):12. https://doi.org/10.3390/soc7020012
93. Burdorf A. How to improve intervention research on the psychosocial work environment? Scandinavian Journal of Work, Environment & Health. 2023;49(5):311–3. https://doi.org/10.5271/sjweh.4107
94. Abildgaard JS, Saksvik P, Nielsen K. How to measure the intervention process? An assessment of qualitative and quantitative approaches to data collection in the process evaluation of organizational interventions. Frontiers in Psychology. 2016;7:1–10. https://doi.org/10.3389/fpsyg.2016.01380
95. Aust B, Møller JL, Nordentoft M, Frydendall KB, Bengtsen E, Jensen AB. How effective are organizational-level interventions in improving the psychosocial work environment, health, and retention of workers? A systematic overview of systematic reviews. Scandinavian Journal of Work Environment & Health. 2023;49(5):315–29. https://doi.org/10.5271/sjweh.4097
96. Voydanoff P. Toward a conceptualization of perceived work-family fit and balance: A demands and resources approach. Journal of Marriage and Family. 2005;67(4):822–36. https://doi.org/10.1111/j.1741-3737.2005.00178.x
97. Siegrist J. Adverse health effects of high-effort / low-reward conditions. Journal of Occupational Health Psychology. 1996;1(1):27–41. https://doi.org/10.1037//1076-8998.1.1.27
98. Karasek RA. Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign. Sage Publications, Inc. on behalf of the Johnson Graduate School of Management, Cornell University. 1979;24(2):285–308.
99. Johnson JV, Hall EM. Job strain, work place social support, and cardiovascular disease: A cross-sectional study of random sample of the Swedish Working Population. American Journal in Public Health. 1988;78(10):1336–42. https://doi.org/10.2105/ajph.78.10.1336
100. Högskolan Dalarna. Metoder: Skapa, motivera och engagera. 2018. Available from: https://www.du.se/sv/samverkan/tema-arbetsliv/metoder/. [Accessed 17th May 2023].
101. Larsson J, Vinberg S. Leadership behaviour in successful organisations: Universal or situation-dependent? Total Quality Management & Business Excellence. 2010;21(3):317–34. https://doi.org/10.1080/14783360903561779

102. Arvonen J. Change, production and employees: An integrated model of leadership. Ph.D. Thesis, Stockholm University, Stockholm, Sweden, 2002.
103. Larsson J. Healthy and effective leadership behaviour through a leadership development programme. Total Quality Management & Business Excellence. 2017;28(13-14): https://doi.org/10.1080/14783363.2016.1216310
104. Berthelsen H, Westerlund H. COPSOQ II - en uppdatering och språklig validering av den svenska versionen av en enkät för kartläggning av den psykosociala arbetsmiljön på arbetsplatser; Stressforskningsinstitutet: Stockholm, Sweden, 2014.
105. Siegrist J, Li J, Montano D. Psychometric properties of the effort-reward imbalance questionnaire. Frontiers in Psychology. 2019;10:2047. https://doi.org/doi:10.3389/fpsyg.2019.02047
106. Kossek EE, Ruderman MN, Braddy PW, Hannum KM. Work-nonwork boundary management profiles: A person-centered approach. Journal of Vocational Behavior. 2012;81(1):112–28. https://doi.org/10.1016/j.jvb.2012.04.003
107. Klefsjö B, Eliasson L, Kennerfalk L, Lundbäck ASM. De sju ledningsverktygen. För effektivare planering av förbättringsarbete. Lund: Studentlitteratur; 1999.
108. Mizuno S. Management for quality improvement: The seven new QC tools. Cambridge: Productivity Press; 1998.
109. Edvinsson J, Mathiassen, SE, Bjärntoft S, Jahncke H, Hartig T, Hallman DM. A Work Time Control Tradeoff in Flexible Work: Competitive Pathways to Need for Recovery. International Journal of Environmental Research and Public Health. 2023;20(691). https://doi.org/10.3390/ijerph20010691
110. Bergsten EL, Haapakangas A, Larsson J, Jahncke H, Hallman DM. Effects of relocation to activity-based workplaces on perceived productivity: Importance of change-oriented leadership. Applied Ergonomics. 2021;93:103348. https://doi.org/10.1016/j.apergo.2020.103348
111. Haapakangas A, Hallman DM, Mathiassen SE, Jahncke H. Self-rated productivity and employee well-being in activity-based offices: The role of environmental perceptions and workspace use. Building and Environment. 2018;145:115–24. https://doi.org/10.1016/j.buildenv.2018.09.017
112. Bjärntoft S, Hallman DM, Mathiassen SE, Larsson J, Jahncke H. Occupational and Individual Determinants of Work-life Balance among Office Workers with Flexible Work Arrangements. International Journal of Environmental Research and Public Health. 2020;17,1418. https://doi.org/10.3390/ijerph17041418
113. Cohen J. A Power Primer. Psychological Bulletin. 1992;112(1):155–9. https://doi.org/10.1037/0033-2909.112.1.155
114. Richardson JTE. Eta squared and partial eta squared as measures of effect size in educational research. Educational Research Review.

2011;6(2):135–47. https://doi.org/10.1016/j.edurev.2010.12.001
115. Cohen J. Statistical power analysis for the behavioural sciences. New York: Academic Press; 1969.
116. Utbildningsdepartementet (The Swedish Ministry of Education). Lag om etikprövning av forskning som avser människor. 2003. Available from: https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/lag-2003460-om-etikprovning-av-forskning-som_sfs-2003-460. [Accessed 17th September 2023].
117. Rubery J, Keizer A, Grimshaw D. Flexibility bites back: the multiple and hidden costs of flexible employment policies. Human Resource Management Journal. 2016;26(3):235–51. https://doi.org/10.1111/1748-8583.12092
118. Rubin SR. Flexitime: Its Implementation in the Public Sector. Wiley on behalf of the American Society for Public Administration. 1979;39(3):277–82.
119. Gregory A, Milner S. Editorial: Work – life Balance: A Matter of Choice? Gender, Work & Organization. 2009;16(1):1–13. https://doi.org/10.1111/j.1468-0432.2008.00429.x
120. Kelliher C, Richardson J, Boiarintseva G. All of work? All of life? Reconceptualising work-life balance for the 21st century. Human Resource Management Journal. 2019;29(2):97–112. https://doi.org/10.1111/1748-8583.12215
121. Kinman G, Jones F. Effort-reward imbalance, over-commitment and work-life conflict: testing an expanded model. Journal of Managerial Psychology. 2008;23(2), 236. https://doi.org/10.1108/02683940810861365
122. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. American Journal of Health Promotion. 1997;12(1):38–48. https://doi.org/10.4278/0890-1171-12.1.38
123. Downes C, Koekemoer E. Work–life balance policies: Challenges and benefits associated with implementing flexitime. SA Journal of Human Resource Management. 2011;9(1):1–13. https://doi.org/10.4102/sajhrm.v9i1.382
124. Nielsen K, Fredslund H, Christensen KB, Albertsen K. Success or failure? Interpreting and understanding the impact of interventions in four similar worksites. Work & Stress. 2006;20(3):272–87. https://doi.org/10.1080/02678370601022688
125. Rennecker J, Godwin L. Delays and interruptions: A self-perpetuating paradox of communication technology use. Information and Organization. 2005;15:247–66. https://doi.org/10.1016/j.infoandorg.2005.02.004
126. Fana M, Milasi S, Napierala J, Fernandez-Macias E, Gonzalez Vazquez I. Telework, work organisation and job quality during the COVID-19 crisis: A qualitative study. European Commission. 2020. Available from: https://jrc122591.pdf (europa.eu). [Accessed 17th September 2023].

127. De Lucas Ancillo A, Del Val Núñez MT, Gavrila SG. Workplace change within the COVID-19 context: A grounded theory approach. Economic Research. 2021;34(1):2297–316. https://doi.org/10.1080/1331677X.2020.1862689
128. Ho DGE. The focus group interview. Australian Review of Applied Linguistics. 2006;29(1):5.1-5.19. https://doi.org/10.2104/aral0605
129. Edvinsson J. (2016). Flexibelt arbete - Utveckling och validering av ett kvantitativt frågeformulär (in swedish, translation: Flexible working - Development and validation of a quantitative questionnaire). Master's Thesis, Högskolan i Gävle, Gävle, Sweden, June 2016.
130. Schafer JL, Yucel RM. Computational strategies for multivariate linear mixed-effects models with missing values. Journal of Computational and Graphical Statistics. 2002;11(2):437–57. https://doi.org/10.1198/106186002760180608

Papers
Associated papers have been removed in the electronic version of this thesis.
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