Examining the effect of working from home on work outcomes through team context among Dutch knowledge workers

Was it “the best thing that happened” for them?

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ABSTRACT

Working from home (WFH) has been made popular by the COVID-19 pandemic, and the Netherlands is a prime example of good conditions when WFH. However, as employers raise suspicion about the phenomenon's benefit, literature supporting WFH has largely been outdated and cannot be generalized to the specific Dutch worker population. Additionally, the lack of team context when investigating WFH situations makes findings less meaningful.

This research focuses on the effect of WFH amount on work outcomes (job satisfaction, work-life balance, and perceived performance) among Dutch knowledge workers; incorporating the two most prominent elements of work teams, perception of silos and (global) team membership, to explain the relationship. An online quantitative survey with 138 Dutch workers revealed that WFH amount does not have a significant effect on job satisfaction or work-life balance, and a very weak positive effect on productivity. Such relationships were not mediated by the perception of silos, or moderated by (global) team membership. These findings are against expectations from previous research about WFH, work outcomes, and team context – that WFH will have a positive effect on work outcomes, mediated by the silos perceptions and is stronger for workers in 'functional' global teams.

This research suggests the need for more context-specific WFH research, as country specifics, cultural contexts, and team contexts are not universal. WFH continues to develop by affecting workers differently than before, and more contexts are needed to explain the relationship. Concerning team contexts in this research, perception of silos and team membership were better defined in conjunction with WFH; especially the former concept, as it was quantified into five areas for the Dutch knowledge workers' population, though there needs to be more investigation into its validity. Implications for Dutch employers in deciding WFH with their employees were also discussed.

KEYWORDS: *Working from home, Silos, Team membership, Work outcomes*

Acknowledgement

Writing a thesis was an exhilarating challenge, with so many ups-and-downs along the way. It started out as "let me take a look at this makeshift change that still exists after the pandemic", and ended as 52 pages of me talking ~~and rambling~~ about a unique working phenomenon. WFH has helped so much with people's lives since 2020, and I am stoked to announce that it mostly did nothing to Dutch workers! Does that mean I should not ask for more of it when I start my first job in the Netherlands, then? Heard the employers hated it, hmmm…

Jokes aside, when I thought of WFH as my research topic three months ago (or even longer, when I was still doing internship last year), I didn't know where the results would take me. To see them materialize and make sense to people is amazing and heartfelt, an accomplishment that propel me to continue pursuing bigger goals of my life – with hard work, maybe you will reach your hands to it. I am grateful for those who have accompanied me on this journey, the last huzzah of IBCoM and the first of many, many more mountains I will climb through.

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It's farewell time to Media & Communication for now, I suppose. I hope one day I get to revisit the field as a Manager looking to improve, but goodbye, IBCoM. I had fun.

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1. Introduction

In the recent decade, teleworking has been a viable option for workers, especially knowledge workers whose job center on intellectual matters (Yang et al., 2021). Technology advancements, and more flexibility in management, have allowed individuals to contribute to organizations from remote locations – via real-time collaboration tools, teleconferencing and teleworking, or asynchronous working. Working from home (WFH) - a synonym and one of the most common setups of teleworking - has been shown to benefit employees' performance and well-being, both directly and through indirect advantages such as work flexibility. Thus, under the right circumstances, allowing employees to WFH adequately can improve the organization's outcomes through individual improvements.

Since the COVID-19 pandemic, WFH has evolved from an alternative work option to a staple of work culture. In Europe, 85% of workers never worked from home before the pandemic; now, 40% of workers expected to work at least two days from home, and 27% believed their managers would offer this option after the pandemic (Silva et al., 2023). The status of WFH is exceptionally prominent in the Netherlands – where not only do people express their desire, but the country is also the first to create legislation protecting WFH rights. WFH has been an option even before the pandemic; however, because of how WFH was coherently structured in the Netherlands, workers here have started to pick up this way of working even more often after the pandemic. From around 40% in 2020, 65% of workers at least (partially) WFH in 2022 – the highest in Europe (Hurst, 2023). WFH is part of the new 'normal' workplace organization in the Netherlands and may very well be the future of work, where jobs can be completed without the need for confining offices.

The Netherlands provides an exemplary example of conditions when WFH, within Europe and even worldwide. WFH before 2020 was a viable option through the Flexible Working Act, provided the employee has worked with the organization for some time. The Act was amended in 2022, currently granting workers in companies with more than 10 employees the legal right to request (partial) WFH - which can only be refused with substantial reasons such as nature of work (Rijksdienst voor Ondernemend Nederland, 2023). Furthermore, employers are responsible for ensuring that employees have the equipment and condition to complete their tasks when WFH. Additionally, the Netherlands' work culture also provides an advantage when WFH. Gaps in culture (such as gender, occupation, and workplace hierarchy) or skills (such as digital literacy or computer skills) are relatively lower in the Netherlands than in many other European countries (Centraal Bureau voor de Statistiek, 2022; Chung & van der Lippe, 2020; Jung et al., 2021). Conformed and beneficial conditions when WFH means that every worker can make use of WFH, further strengthening the benefits on organizational and societal levels.

While the Netherlands is and will remain the best country to experience WFH, the benefit has recently been dampened by whether WFH benefits workers and organizations. In a trend that is not exclusively within the Netherlands, employers seek to reduce the amount of time WFH and have workers back in the office – though Dutch employers cannot coercively restrict WFH and force people to work full-time in person. The common denominator to challenge WFH use is its effects on work outcomes and, as Dutch employers put it, "social incohesion" (NL Times, 2022). Claims of WFH having detrimental effects has been unsubstantiated, but in the context of post-pandemic, so are the claims of it having positive effects. COVID-19 has been a double-edged knife, vastly increasing the popularity of WFH while making previous research's results about it not as applicable (or reliable) anymore.

There are two reasons to question previous research on WFH, when applying to the case of the Netherlands. First, the context has changed: WFH is no longer a niche, alternative option for work as it used to be. From a primarily occasional, ad-hoc basis (Allen et al., 2015), WFH is now common among workers for part-time and even full-time work. This does not invalidate the findings from previous research; however, the valence and extent of effects are questionable. Recent research about WFH continues to re-examine these relationships, though the pandemic hindered the process for some time – much research had to focus on forced WFH as a result of the pandemic, which distorts the voluntary WFH in which people get to arrange their matters. Secondly, country context might make results from previous research not applicable to the Netherlands. Ultimately, WFH is still a part of the work culture, constituting a country culture where people have differences. In other words, if people from various countries have different ways of working, it is logical to think that they will not approach and get the same out of WFH. There are previous and recent studies about WFH, but they are conducted in different countries (such as the United States and Germany - see Niebuhr et al., 2022; Yang et al., 2021). It cannot be assumed that the same results apply to the Netherlands, which does not have the exact same culture.

Now that COVID-19 is behind as an epidemic, and preliminary results about WFH post-pandemic have started to emerge, it is high time to investigate the relationship between time WFH and work outcomes in the specific context of the Netherlands. While there are many groups of workers to consider the effect, the research focuses on knowledge workers in the Netherlands, who are using their knowledge to complete organizational tasks. They are the prime force that drives the outcome of organizations through their work, and are also sensitive recipients of effects when WFH. Because of that, the research question will be:

> ***RQ:*** *For knowledge workers in the Netherlands, what is the effect extent of WFH amount on work outcomes after the pandemic?*

To supplement this research question, two sub-questions exploring the team context when WFH are also included. Contexts, especially those about team and work environments, have been lacking from previous WFH studies. As mentioned above, WFH is part of a culture; therefore, taking context out of the phenomenon leads to inconsistent results that cannot inform society. Due to the scope of the research, WFH effects will only be explored in light of the two most prevalent phenomena in contemporary organizations. The phenomenons are quality of collaboration process (materialized through the concept perception of silos) and being in global teams; they have previously been linked to both WFH and work outcomes:

> ***Sub-RQ1****: For the aforementioned workers, to what extent does perception of silos affect the relationship that WFH has on work outcomes?*
> ***Sub-RQ2****: For the aforementioned workers, to what extent does the relationship of WFH and work outcomes differ, between those of global and non-global team membership?*

This research contributes to the literature about WFH, organizational silos, and global teams' membership. In the case of WFH literature, the research updates previous findings regarding the effect on outcomes, to account for a new context. As WFH becomes more common, the results should take into account the new popularized status of the phenomenon. Additionally, it also adds to the knowledge about WFH in the Netherlands – while there have been studies about WFH in this country, few have looked into the communication or organizational aspects of the phenomenon (Van Der Lippe & Lippényi, 2020). Meanwhile, this research supplements the literature about organizational silos and team membership by connecting these concepts to a concrete phenomenon. Silos have been characterized by the difficulty to conceptualize across studies (Bento et al., 2020), while team membership is a contextual concept often not focused on in organizational studies. By linking them and their relationship to an established concept like WFH, more attention can be drawn to the concepts, and they will be more clearly defined.

This knowledge also benefits conscious or managerial workers looking to understand and improve their workplace. Learning the effects that the amount of time WFH has on individual work outcomes should inform employers/managers in deciding how much WFH is adequate for their organizations. Having this knowledge is a competitive business edge, especially when workers are increasingly looking for employers with flexible working conditions (Silva et al., 2023), and WFH is becoming society's new 'normal.' – while employers look for "social cohesion" in their organization. Furthermore, exploring the WFH effect through the process of collaboration (informed through the perception of silos) and team membership can help managers find and implement informed changes to the working environment for a better outcome, with or without WFH.

The following parts of this paper will be structured as follow. Part 2, Theoretical Framework, briefly explore the history of relevant concepts in this study, including *WFH*, *workers' outcomes*, *perception of silos*, and global *team membership* – along with their hypothetical relationship, thus forming hypotheses. Part 3, Methodology, describes this quantitative study by describing the methodology, online survey design, data collection process, and operationalization of above-mentioned concepts. Part 4, Findings, discusses the results of hypotheses mentioned in Part 2, and additional findings with demographic variables. Part 5, Discussion, reflects on this research's findings obtained in Part 4, comparing to insights from assumptions formulated from the theoretical framework. Finally, Part 6, Conclusion, discusses implications, shortcomings and suggestions for future research regarding WFH and work outcomes.

2. Theoretical Framework

This section introduces previous research done on relevant concepts of the study: *Working from home*, *workers' outcomes*, *perception of silos*, global *team membership*. Relationships between concepts are explored and corresponding hypotheses will be formulated.

2.1. Working from home (WFH)

Following the history of WFH, the term gained heavy traction during the COVID-19 pandemic: On Google Scholar, the number of articles that include this keyword since 2019 far exceeds those written before that period. To describe a work practice where employees work in a location that is not an office, the term is now predominantly used – which has not been the case until recently. Before the pandemic, WFH is often used interchangeably (albeit with slight distinction) with terms such as *telecommuting, teleworking, remote working, distant working, and flexible working* (Allen et al., 2015; Nakrošienė et al., 2019; Sullivan, 2003). The distinction was often used when there was a need to emphasize the at-home nature of the phenomenon (Sullivan, 2003). Recent research has largely ignored this connotation and used 'WFH' to represent working from remote locations (see Bellmann & Hübler, 2021; Niebuhr et al., 2022). COVID-19 pandemic have popularized WFH, yet its own persistance even as society return to normal signals the phenomenon's prevalence. WFH is now a norm rather than an alternative – its effect grows in size and magnitude, requiring academia to re-examine under new circumstances.

Nevertheless, WFH shares similar characteristics as telecommuting – the oldest term in the family, coined in the 1970s in the United States (Allen et al., 2015). Telecommuting, along with other terms in the family, has been defined and conceptualized differently across research – due to various designs, samples, disciplines, and research preferences the studies fit into (Allen et al., 2015; Nakrošienė et al., 2019). This research adopts a WFH definition similar to the concept of telecommuting formulated by Allen et al. (2015), but includes a post-COVID clause to emphasize the new evolution of the phenomenon. Based on the original concepts by Nilles (1994) and an extensive review of the literature up to now, the original definition already formed strict criteria for a knowledge worker to be participating in the phenomenon:

> *WFH phenomenon involves knowledge workers in an organization (partially) substituting their normal work hours in a central office with work hours from home. The phenonemon is possible through the use of technology to conduct work tasks, and emerged as a result of the COVID-19 pandemic.*

For this research, three conditions are essential to narrow the generalization of telecommuting (or, interchangeably, WFH) workers. First, WFH involves knowledge workers – who apply analytical or theoretical knowledge from formal training to complete their tasks – *of an organization*. Going beyond a contractual basis, these employees are connected through developing an organizational culture – within which they are the core factor and share manifestations to make sense of their daily activities (Mumby & Kuhn, 2018; Peyton, 2005). Contractual, gig or outsourced workers do not fall within the scope of organizational members; thus, their WFH conditions are excluded from this study. Secondly, these knowledge workers need to work at a central office in which their WFH partially replaces. Working in a central office is different from mobile working – as the former features more collaboration and cooperation, whereas the latter features more self-reliance and outward interaction (Allen et al., 2015; Nakrošienė et al., 2019) - in terms of WFH effect, and we only concern the former setting. And if home work adds, instead of (partially) *replacing* typical office work, then it is not WFH. Finally, specific timeframe for WFH in this research is *after the pandemic*. There are various reasons to WFH even before the COVID, but the research only take into account the recurring phenomenon that happened during-after the pandemic.

While effects of WFH can be examined through difference in various arrangements (see Allen et al., 2015), the Netherlands' work situation draw particular interest to effect based on *amount of time WFH* (and concerning context.) The country mostly presents an ideal state of WFH for knowledge workers after the pandemic – employees have right to and (relatively) equal conditions when WFH, as described in the introduction – except for the unresolved confusion in amount of time WFH. While the arguments regarding WFH amount's effect is not limited to only in the Netherlands, it is certainly more relevant as the most major point of tension between employees and businesses here. And as previous literature about amount of time WFH are explored, three threats to generalizability in the post-pandemic world that propeled this research will emerge: findings' consistency, country context, and omission of workers' team context.

2.2. Workers' outcomes

With an orientation towards managerial improvements, this research examines the effect of WFH on knowledge workers' outcomes across three dimensions: *job satisfaction, perceived performance*, and *work-life balance*. Similar to WFH, there are many dimensions regarding work outcomes (see Allen et al., 2015); however, these dimensions are examined since they concern active members of an organization, are dimensions that the workers can directly experience, and plays a significant role in the organization's success. While the direct effect of WFH amount on work outcomes can previously be summarized as positive, the first two threats of generalizability

(namely, findings' consistency and country context) will require re-examining this effect.

Previous studies implied that the amount of time WFH will, one way or another, have beneficial effects for all three dimensions of work outcomes. In the case of *job satisfaction*, the effect is direct, though not linear: A meta-analysis of 28 primary studies done by Gajendran and Harrison (2007) revealed that WFH has a positive effect on job satisfaction, with a small effect size. Golden and Vega (2005) found that the relationship is curvilinear in an inverted U-shape at the 15.1 hours threshold, indicating that a more intense amount of WFH actually decreases job satisfaction. In the case of *perceived performance* and *work-life balance*, the amount of time WFH has an inconclusive effect, but its accompanying benefits are shown to influence these outcomes. Previous studies have various conclusions regarding the direct relationship between teleworking and perceived performance (see Kelliher & De Menezes, 2019) or work-life balance (see Elbaz et al., 2022). However, more time to WFH means certain investment (from both employers and employees) for better working conditions at home and more workplace temporal flexibility – "the ability to self-influence when, where, and how long when engaging with which work-related tasks" (Hill et al., 2008, p.152). These effects have a positive influence on perceived performance & work-life balance, and they have been found to be associated with the relationship between WFH and these work outcomes (Allen et al., 2015; Metselaar et al., 2022; Yang et al., 2021).

While the results were positive, it is questionable whether they can be generalized to the population of Dutch knowledge workers. First, many of the aforementioned studies were conducted before WFH became a norm due to the pandemic. While many knowledge workers have experienced teleworking before 2020 (over 4 million, Statista Research Department, 2023a), the purpose (sporadic, ad-hoc against routine WFH) and arrangements are different compared to after 2020. Consequently, how Dutch knowledge workers perceive WFH and work outcomes could have changed – thus, assuming the relationship or involving elements (like temporal flexibility) are still present cannot be entirely accurate. Secondly, the aforementioned fact is even more important when considering that Dutch workers are already among the workers with the highest work outcomes in Europe and worldwide. Job security, fewer inequalities, working culture of autonomy and transparency, and equal emphasis on leisure/off-work activities have all been cited as reasons for the Netherlands to have high performance (measured through GDP, OECD, 2022a), job satisfaction (see Personeelsnet, 2017; PwC, 2022) and work-life balance (OECD, 2022b). A high baseline may mean that the amount of time WFH, with added benefits like temporal flexibility, can only add little to improving the work outcomes. There are possibilities for the amount of time WFH to not affect work outcomes at all – a rare occurrence, but it has been observed in research before (Kossek et al., 2006; Vink et al., 2012).

With doubts about the generalizability of previous research results, there is a need to re-establish the relationship between the amount of time WFH and work outcomes under the new circumstances. While the purpose of WFH has changed because of the pandemic, its benefit to knowledge workers is similar to before. Because of that, it can be hypothesized that the amount of time WFH has a positive relationship with all dimensions of work outcomes:

> *H1a-c: For Dutch knowledge workers, the amount of time WFH has a positive relationship with work outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance.*

To understand the effects of WFH and work outcomes, we must go beyond the direct effect and explore the team context of Dutch knowledge workers. Also the third and final threat for generalizability, team context, has been noted by Allen et al. (2015) as lacking from previous studies and should be included more in future research. Interestingly, when accounted for elements in the team, such as team effort (Ha et al., 2022) or co-workers also WFH (Van Der Lippe & Lippényi, 2020), the effect of WFH on work outcomes becomes more negative. Within the scope of this research, two of the most significant aspects when working in teams, namely collaboration (materialized through the *perception of silos*) and *team membership* (or global orientation), are included to explain the variance in the effect of WFH on work outcomes.

2.3. Organizational silos & perception of silos

Within an organizational context, silos are isolated individuals, groupings, teams, or departments that function isolated and apart from each other – which hinders communication, cooperation, and knowledge-sharing ("Definition of Silo", 2023). Consequently, *perception of silos* measures the extent of isolation and separation from collective effort that a worker experience while working. It is worth to note that *perception of silos* and collaboration quality are similar constructs for the effectiveness of working together – except that the former focuses more on the obstacles when collaborating, while the latter offers a retrospect snapshot of the process. Work teams and their interdependences are important structures for productivity and flexibility in organizations, due to the various advantages they offer (Mumby & Kuhn, 2018); as organizational silos disconnect workers from collective decision-making and task processes, they mitigate the benefits and therefore pose a threat to the cohesive team structure. Therefore, for improving communication process and consequently outcomes, organizations are increasingly aiming to identify silos perceived by team members, break them down and prevent formation (see Edwards, 2020; Fenwick et al., 2009.)

Since the pandemic, empirical data suggested an increase in organizational silos due to

WFH – though whether perception of silos also increased or not remains questionable. With remote working, knowledge workers collaborate more often in closed-off groups and increasingly work asynchronously (Yang et al., 2020). Through data mining over 360 billion emails of organizations worldwide, Zuzul et al. (2021) also uncovered that organizations now have more silos because of increased modularity. In other words, email communication is more often in closed, smaller recipient groups instead of team-wide sharing - therefore, WFH propelled an increase in segregated communication and thus increased silos. However, it should be highlighted that the increase of silos is observed through technical observations, while perception of silos is a cultural phenomenon. It is possible that the process of collaboration remained the same for workers, even though barriers increased – since silos persist through communication, rather than technology (Cromity & De Stricker, 2011). The mismatch in perception and reality can be very accurate in the case of Dutch knowledge workers – known for an egalitarian culture, conformity and straightforward mindset (Gordijn, 2010) that will enable information to be freely circulate and reach members of the organization.

Regardless of whether the perception of silos increased due to WFH, it is still known to threaten perceived performance, job satisfaction, and work-life balance. Much of this stems from the resulting "silo mentality," where teams do not share knowledge, essentially making work more challenging for themselves (De Waal et al., 2019; Fenwick et al., 2009). Without additional knowledge from colleagues to support, workers will need to spend more time and effort completing a task – which, with an uncoordinated decision-making process, can be an irrelevant or duplicate effort towards organizational goals. The learning process is also hindered by unshared knowledge that teams keep secret from each other. Together, the silo mentality results in lost autonomy, inefficient task completion, longer hours that creates conflict between work & life, and overall dissatisfaction with work. Beside isolated behaviors, organization silos also fosters unhealthy competition and an against-mentality for teams within organizations. While it is normal for organizational teams to share a sub-culture or social identity, silos encourage an "us-against-them" mentality that makes connecting and working toward a common goal challenging (Forsten-Astikainen et al., 2017.) Rivalry competition and against mentality result in decreased colleague relationships; with job satisfaction directly tied to these relationships (Belias & Koustelios, 2014), organizational silos have directly resulted in lower satisfaction. In general, organizational silos create knowledge blocks and unhealthy connections between teams - a social construction that is supposed to be interdependent to be efficient – thus affecting workers' outcomes.

With the amount of time WFH likely to have an effect on the perception of silos, and the perception having negative effect on work outcomes, we can further hypothesize that a mediation

effect exists between amount of time WFH and work outcomes. That is, the effect of amount of time WFH on each work outcomes can be (partially) explained through the perception of silos

> *H2a-c: For Dutch knowledge workers, perception of silos mediates the relationship between amount of time WFH and workers' outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance.*

2.4. Team membership: Global teams

Global teams are nationally, geographically, and culturally diverse teams that collaborate through communication tools (Jarvenpaa & Leidner, 1999), and are composed of workers that collaborates with specific individuals for a specific task. As Maloney and Zellmer-Bruhn (2006) defined, global teams differ from non-global teams with 1) a globally dispersed work environment or 2) heterogeneity on multiple dimensions. The two conditions can further be clarified using insights from Bosch-Sijtsema et al., 2009. First, distributed teams, in which team members work in different offices nationally and have geographical distances, form the basis of global teams. The virtual element is present but not absolute in global teams – some members can still meet face-to-face together while using communication tools with others. Secondly, global teams should have national cultural heterogeneity – in other words, its members come from more than one nation & culture. This heterogeneity overlaps with multiculturalism, is a salient characteristic of global teams, and makes for better categorization than other elements (Zander et al., 2012).

Global teams have been prominent towards the end of 20th century, and continues to be popular in contemporary world – interwoven with WFH developments. They became popular as businesses seek opportunities beyond borders in a world that is complex, competitive and culturally diverse (DiStefano & Maznevski, 2000; Ravlin et al., 2000). In addition, the evolution of technology tools alleviated the need for employees to be physically present when working on tasks and collaborating. In fact, ICT developments are one of the connections between global teams and WFH, as both can be feasible now thanks to it. Naturally, global team workers are more accustomed to working and collaborating from afar with technology tools – a working situation similar to WFH after the pandemic that is being investigated.

Given global team workers' familiarity with WFH conditions, they are more likely to benefit in terms of work outcomes than non-global workers. They have already adapted their workplace to collaborate distantly with colleagues – meaning that when the world transitions to WFH, they do not undergo such drastic changes from other workers. Good workplace environment & use of ICT are factors that increase work-life balance when WFH (Yang et al., 2021), and global team workers are therefore better equipped for WFH. Global workers also have better interpersonal

communication, through either a personality enabling them to work virtually or intercultural competence – both of which have been found to positively correlate with performance (Bellmann & Hübler, 2021; Mateev & Mitler, 2004). Finally, Hill et al. (1998) found that productivity, flexibility, and work-life balance are perceived as higher in naturally virtual teams – alluding to the temporal flexibility benefit of WFH. Global teams are likely to be virtual teams, and therefore are likely to make use of WFH benefits for better outcomes.

However, being in a global team only strengthens the positive effect between WFH and workers' outcomes when the global team itself is highly functional. Only in productive global teams are knowledge-sharing activities occurring frequently, which indirectly increase team effectiveness (Alsharo et al., 2017) through negate silos and accompanying effects. When a global team does not collaborate effectively, knowledge-sharing is not frequent, and the team still has to face a build-up of organizational silos similar to those from a non-global office. Therefore, we hypothesize that only in an objectively "functional" global team where everyone works well together, will there be a moderating effect on the relationship between WFH and workers' outcomes. That is, if the worker perceive that their global team(s) are functioning well, they are more likely to see the extent of WFH having a positive effect on the outcomes, compared to those only working in non-global office teams:

> *H2a-c: For Dutch knowledge workers, team membership moderates the effect of WFH on workers' outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance. Workers in "functional" global teams likely have a stronger positive effect of WFH on workers' outcome, compared to workers in non-global office teams.*

Figure 2.1 presents the model of hypothesized relationship between variables of concern in this research. The hypotheses will be operationalized in the methodology section.

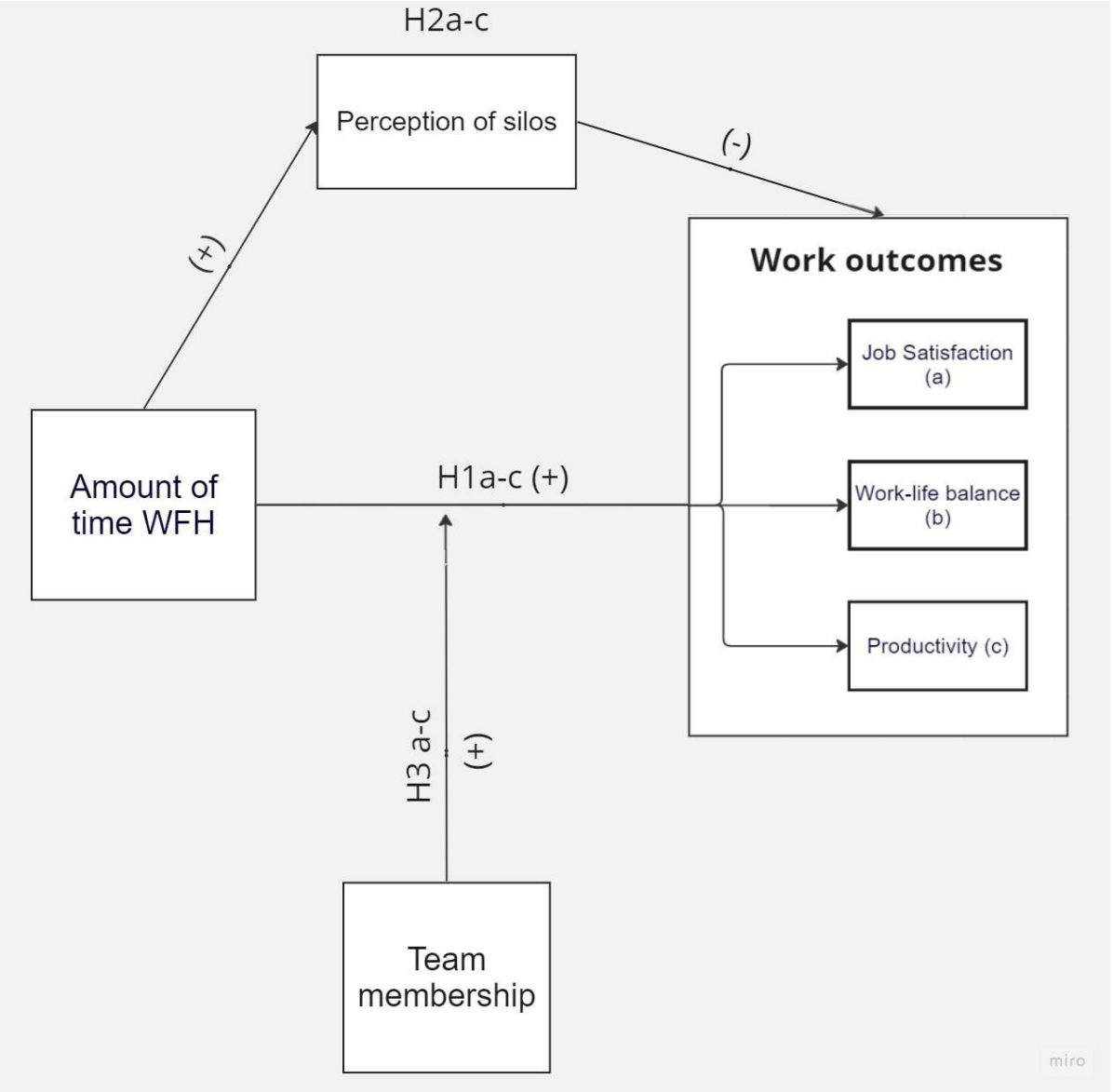

Figure 2.1: Theoretical relationship between variables of research

3. Methodology

This section explores the research method used for the study. First, the use of quantitative (survey) design is justified. Then, the survey design consisting of sample description (size and criteria), sampling strategy and summarized demographic information will be presented. Finally, the operationalization of variables explored in the theoretical framework, through details of used measures and scales, will be provided.

3.1. Justification of method

A quantitative research approach was used to explore WFH, work outcomes, and affecting factors. The approach uses numeric measurements to investigate a situation (Mugenda, 1999) systematically; in this case, there were three reasons to use this approach. First, the research focused on analyzing the relationship of independent variables *amount of time WFH*, dependent variable work outcomes (*work satisfaction*, *perceived performance, work-life balance*), mediating variable *perception of silos,* and moderating variable *team membership*. Since the goal is to examine the relationship between variables, quantitative methods were more suitable for the study than qualitative ones (Muijs, 2011). Secondly, the research strived for generalized conclusions towards a specific population. Concepts measured in this research reflect behaviors and attitudes of (specifically Dutch) knowledge workers in the workplace. These concepts can be converted into quantitative data using questionnaires and numerical values – and through statistical analysis, significant and generalizable conclusions can be drawn for the selected population (Muijs, 2011). Finally, the goal of the research was to expand on existing knowledge through deductions. Previous knowledge about *Working from home* and outcomes is available; therefore, a top-down approach is adopted in this research. In other words, hypotheses are deduced based on previous literature under the impression of cause-effect relationships (Babbie, 2017). Because of the approach, quantitative methods are appropriate to test hypotheses and thus increase knowledge about WFH.

Having established that a quantitative approach was appropriate, this research also had an (online) survey research design. Surveys “allow researchers to quickly obtain data and describe the characteristics of a large population” (Babbie, 2017, p. 302) while being familiar to participants. Other relevant advantages included low costs, low time demand for parties involved, and anonymity. Given the scope and time constraints of this research, an online survey was the best option to measure the behavior and attitudes of the worker population in a time-efficient and appropriate manner. It is worth noting that survey research design is not without flaws – there are also disadvantages, such as nonresponse bias and no possible adaptation during the process (Babbie, 2017) that are taken into account when designing the survey.

This quantitative research meets the requirement for research ethics. All survey questions (including the referral questions mentioned below) have been reviewed and approved by an academic supervisor and several peers before sendout – none discussed sensitive topics that may cause harm or discomfort for participants. Before answering the survey, participants are informed about the research purpose and content before consenting to participate. All responses were anonymous with no linked personal information; the voluntary referral collected personal e-mail addresses only for correspondence purposes, and could not be linked to initial responses.

3.2. Survey design

The population of this research was Dutch knowledge workers who have (partially) worked from home – with exclusion and inclusion criteria formed mainly based on characteristics of WFH workers in the theoretical framework, and concern for the labor market. Most importantly, as *knowledge workers in an organization*, participants should have obtained (or are currently obtaining) a degree from a University of applied science or higher – a participant with a vocational degree is excluded since vocational education focuses on the process of performing tasks rather than applying insights to them. Qualified participants also needed to be *organizational members*, as either full-time, part-time, or intern employees. In addition, participants must work in one or two *fixed central locations* (offices) instead of traveling between various locations to complete work – to distinguish from *mobile workers* that experience WFH differently. Finally, participants needed to have *WFH due to the pandemic* – if this is not the case, the participant would be excluded instead.

Besides the characteristics of WFH workers, since the research focuses on the Dutch labor market, participants needed to *work for a Dutch-related organization* to be included in the survey. A majority of participants resides, work, and are registered as Netherlands workers - already making them eligible for the survey. To account for participants from distributed or virtual teams (Bosch-Sijtsema et al., 2009), those who do not reside in the Netherlands but work for organizations or teams operating in this market would be considered. Together, the WFH characteristics and Dutch-related requirements formed the inclusion of workers in the population – contingency questions were included in the survey to filter out unqualified participants.

A two-step sampling method, consisting of random sampling and then complimentary snowball sampling, was used to acquire this sample. The survey was created online using Qualtrics in English and Dutch, then distributed through diverse platforms (Prolific, SurveyCircle, and own's network.) 83.3% of responses were received through Prolific - a crowdsourcing platform dedicated to academic research, with a higher data quality than other crowdsourcing platforms (see Palan & Schitter, 2018; Peer et al., 2017). 11.5% of responses came from SurveyCircle (an open platform where researchers can post surveys, with the target population primarily university students) and

5.2% from researcher's own LinkedIn network. Additionally, after participants completed the survey (regardless of validity), they could generate referral codes when suggesting the survey to colleagues and friends – for every seven valid responses, they would receive €15.

While the sample size can be estimated using various calculations, available information about Dutch knowledge workers' population suggest the use of Cochran's (1977) formula. With *Z* as z-score (of confidence interval,) *p* as population proportion, and *e* as margin of error:

$$\frac{Z^2 * p * (1-p)}{e^2}$$

In this research, population proportion refers to knowledge workers that voluntarily WFH (in other words, hold no prejudice towards WFH). This proportion was loosely estimated based on a poll by FNV trade union in the Netherlands, which found that 90% of workers ($n \approx 5300$) prefer some form of WFH after the pandemic (NOS, 2021). Assuming that poll respondents are entirely knowledge workers, for 95% confidence (z-score: 1.96) that actual results are within $\pm$5% of the measured results, the sample size must be at least:

$$\frac{Z^2 * p * (1-p)}{e^2} = \frac{1.96^2 * 0.9 * (1-0.9)}{0.05^2} \approx 138\, respondents$$

The survey received 323 responses, of which 138 were valid and included in the analysis. Reasons for exclusion included not belonging to the target population (*n* = 175), failing the attention check question (*n* = 6), inconsistent answers (for example, never worked in global teams yet still rated the quality, *n* = 2), and being flagged as a duplicate or computer-generated response (*n* = 2). For the remaining responses, basic information regarding relevant demographic (language, age, education, employment status) and workplace conditions (tenure, organization size) are summarized below. From summary statistics and cluster analysis, the sample is slightly in favor of English-speaking (*n* = 91), and slightly skewed towards younger workforce (skewness of age range variable = 1.60). However, education level is also notably representative of the Netherlands' population in 2022 – as around 40% of knowledge workers obtained a Master degree or higher, while the rest have HBO or WO degrees (Statista Research Department, 2023b).

Table 3.1

Summarized demographic information of sample participants

Demographic	Count	
	N	%
Language (in which survey is taken)		
English	91	65.9
Dutch	47	34.1

Age range		
20-30	83	60.1
31-40	34	24.7
41-50	14	10.1
51-60	5	3.7
60+	2	1.2
Highest education obtained		
HBO (Applied Science)	49	35.5
WO (Research)	30	21.7
Master's degree	51	37.0
Doctoral degree	8	5.8
Employment status		
Full-time employed	84	60.9
Part-time employed	41	29.7
Internship	13	9.4
Time worked in organization		
< 1 year	46	33.3
1 – 2 years	36	26.1
3 – 5 years	28	20.3
6 – 10 years	12	8.7
> 10 years	16	11.6
Organization size		
1-9	11	8.0
10-49	32	23.2
50-249	34	24.6
250+	61	44.2
Working in a functional global team		
Yes	80	58.0
No	58	42

The research made use of statistical softwares R and SPSS. Using R, a hierarchical cluster analysis was performed to categorize participants into groups with similar patterns - Appendix A details the process and result. Otherwise, all results are conducted by using SPSS, with imported Hayes' PROCESS macro (Hayes, 2013.)

3.3. Operationalization

With the exception of *team membership* and *satisfaction* variables (which are categorical), table 3.2 summarizes the distribution statistics of relevant variables measured in this research. All variables have a normal distribution (skewness and kurtosis < 1). While this section briefly justifies the operationalization of concepts, a full description of items can be found from the questionaire, in Appendix B.

Table 3.2

Summary of distribution statistics for variables of main interest in research

Statistics	Amount of time WFH	Perception of silos	Performance	Work-life balance
Skewness	.49	.40	-.63	-.70
Kurtosis	-.36	-.12	.32	-.23

Amount of time WFH was measured by asking participants the amount of time they would WFH on a normal workweek. Normal workweek was assumed as a 40-hour workweek, with a day WFH treated as 8 hours. Participants were asked to estimate the normal amount; in case of irregular WFH schedule, they were asked to estimate by summing the amount of time WFH over the nearest month, then dividing by 4 and rounding up to the nearest integer. On average, participants spend 17.61 hours WFH (or around two days in a week, *SD* = 9.24).

Team membership was defined by asking participants two questions. The first question asked whether they have worked in a global team before; the answer was yes if participants satisfied all three of theoretically-informed conditions: having worked closely with (a set of) colleagues in the organization for a goal, at least one team member did not work in the same office as them, the team consisted of more than one nationality. The second question asked the participants to rate the average quality of global teams if they belonged to at least one, on a 4-point Likert scale. Those who rated "Bad" or "Not so good" were classified into the same group as those not working – as in theory, only "functional' global team might moderate the relationship between WFH and work outcomes. For analysis, 80 participants were in functional global teams, while 58 were either in non-functional or not in global teams at all.

Perception of silos was measured using theoretical predicted silos-busting categories, proposed by De Waal et al. (2019). While perception of silos was rarely measured in academic research due to its various construction (Bento et al., 2020), a quantification of silos perception is needed to generalize its connection to WFH and outcomes. The proposed categories of De Waal et al. (2019) were closest to this need, as they measured silos-busting behavior in conjunction of organizational outcomes; the original study was also performed in the Netherlands, making the use of scale in this research somewhat more reliable. There were 31 items divided over 5 categories, and participants were asked to rate each item in terms of presence in current organization, using a 5-point Likert scale (from "Strongly disagree" to "Strongly agree"). Items have been re-worded where possible for clarity and better understanding. Afterwards, principal component analyses and reliability analyses were performed, to eliminate items with weak factor loadings (< .45) or factors with low reliability (Cronbach's alpha < .50). This resulted in 11 items being excluded from analysis; the remaining 20 items were loaded on five factors, as indicated in table 3.3 below.

Table 3.3

Principle Component Analysis of silos-busting category items

Silos-busting category items	Factor loading				
	1	2	3	4	5
Factor 1: Organizational-wide values					
1. [Organization] promotes and support collaboration	.734				
2. [Organization] promotes a shared identity between employees	.668				
3. [Organization] promotes a mindset of collaboration between employees	.732				
4. [Organization] creates shared goals that employees can work on together	.681				
8. [Team] has planning and/or reviews in which different teams are involved	.585				
10. [Team] has programs and projects for collaboration between individuals	.508				
Factor 2: Working environment					
21. [Environment] has a physical space where we can meet colleagues		.729			
22. [Environment] encourages spending time with people from other teams		.734			
23. [Environment] has an informal setting where colleagues can get to know each other		.833			
Factor 3: Sense of Community					
18. [Environment] has information about other teams' goals and status			-.755		
19. [Environment] has communities/networks to share knowledge, best practice and experience			-.666		
30. [Department/Team] adapts evaluations & incentive systems to encourage collaboration with other teams			-.780		
31. [Department/Team] acknowledges and rewards individuals that effectively work with other colleagues/teams			-.743		
Factor 4: Way of Working					
5. [Team] has clear roles, responsibilities, goals, tasks, and outcomes				.754	
6. [Team] has a standardized way of working for teams				.839	
12. [Team] has methods to deal with conflicts and disagreement				.633	
Factor 5: Leadership & Management					
24. [Managers] are taking responsibility for their area of expertise, and share responsibility in other areas					-.816
25. [Managers] are making sure organizational leaders have collaborative behavior					-.541
26. [Managers] are developing their interpersonal skillsets to collaborate and network					-.504
27. [Department/Team] recruits colleagues that is collaborative and open to networking					-.616
Cronbach's alpha	.79	.80	.70	.69	.78
Eigenvalue	5.96	1.65	1.55	1.28	1.22

Note. N = 138. The extraction method was principal component analysis with an Oblimin (Kaiser Normalization) rotation. Factor loadings < .45 suppressed.

The score of each item was reverse-coded, following the assumption that the stronger silos-busting behaviors are, the less silos perceived by knowledge workers in a particular aspect of work. Five factors, based on the content of items, then indicate perception of silos through five work aspects. Short description of the areas (perceived by participants), mean score and standard deviation are summarized in table 3.3. Together, these factors explain 61.7% variance of the *perception of silos* variable. Additionally, the average of 20 items are combined to create a score for perception of silos. The mean score (*M* = 2.21, *SD* = .48) indicates that Dutch workers have experienced somewhat low amount of silos when working at their current company.

Table 3.4

Summarized meaning, statistic and reliability score of factors in silos perceptions.

Name of factor	Meaning	Mean [SD]
Organizational-wide values	A lower score indicates little problem sharing goals and values between organizational members	2.05 [.53]
Working environment	A lower score indicates an open, friendly working environment that does not hinder communication	2.61 [.77]
Sense of community	A lower score indicates more feeling of belongingness, less isolation and disconnection at work.	2.48 [.79]
Way of working	A lower score indicates standardized way of working that does not hinder communication	2.01 [.71]
Leadership and Management	A lower score indicates the thought that managers & leaders are not cause of hindered communication.	2.17 [.68]

Three separate scales measured variables, *job satisfaction, work-life balance,* and *perceived performance,* which formed dimensions of work outcomes. Items on each scale of these variables were measured on a 5-point Likert scale, asking participants to rate how accurate the items were when applied to them (From “Definitely not true” to “Definitely true”). The average is then calculated for each scale to form measurement score of its respective variable.

Job satisfaction was measured using only a one-item scale, “I am satisfied with my current work situation”. A single-item measure is commonly used for assessing overall satisfaction, since multiple-item scales can ignore some important aspects or include unimportant aspects, leading to misconclusion (Scarpello & Campbell, 1983). In addition, many studies verified that a single-item measure is appropriate to measure satisfaction (Cheung & Lucas, 2014; Nagy, 2002). The mean score of job satisfaction in this sample was notably high (*M* = 4.21, *SD* = .86), especially when

comparing to similar studies before and during the pandemic (see Bellmann & Hübler, 2021; Yang et al., 2021, *M* = 3.80, *SD* = 1.12)

Work-life balance was measured using a scale constructed by Brough et al. (2014), consisting of four items. While there were many scales seeking to operationalize the concept of work-life balance, the scale by Brough et al. (2014) has notably been assessed through a longitudinal study. Four items included in the scale were empirically compact and conceptually valid – advantages when comparing to other scales. A principal component analysis (PCA) revealed that all four items loaded on one factor, explaining 69.9% variance. The Cronbach's alpha of this scale was .85, indicating good reliability. On average, participants have average-to-good work-life balance (*M* = 3.69, *SD* = .94)

Perceived performance was measured using the Task performance scale of Individual Work Performance Survey (Koopmans et al., 2012). Five items of the scale had good psychometric properties, produced comparable measures of self-evaluating performance across a range of occupations, and was resistant to country context (Koopmans et al., 2014a; Koopmans et al., 2014b; Van der Lippe & Lippenyi, 2020). A principal component analysis (PCA) revealed that all five items loaded on one factor, explaining 55.6% variance. The Cronbach's alpha of this scale was .79, indicating good reliability. The mean score indicated good self-performance perceived by participants (*M* = 4.00, *SD* = .66)

4. Results

This section entails statistical analysis results obtained from the study. Each sub-section contains one (group of) hypothesis, containing the hypotheses themselves, choice of statistical test and results. Additionally, a section for additional results is included for conclusions that did not belong to the formulated hypotheses.

4.1 Relationship between WFH amount and work outcomes (H1a-c)

The first hypothesis, testing the relationship between amount of WFH and work outcomes, was as follow:

> *H1a-c: For Dutch knowledge workers, the amount of time WFH has a positive relationship with work outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance.*

For hypothesis H1a, *amount of time WFH* was measured on a continuous scale, while *job satisfaction* was measured on an ordinal scale; thus, an ordinal logistic regression analysis was performed. The predictor variable, *amount of time WFH,* was found to not significantly contribute to the model (*B* = .03, *SE* = .02, *Wald* = 3.55, *p* = .060). For every hour increase in time WFH, there is a 3% increase in odds of being in a higher level of job satisfaction than the current level (95% CI [.00; .07]). An increase in time WFH has a positive effect on job satisfaction, however the effect is non-significant. H1a was rejected.

For hypotheses from H1b and H1c, since two dependent variables *(perceived performance and work-life balance*) were measured on a continuous scale, two separate linear regressions were performed. The first linear regression for *work-life balance* found the model to be insignificant, *F(1, 137)* = 1.31, *p* = .255, R^2 = .01, with the amount of time WFH being a positive but insignificant predictor (β = .10, *p* = .255). An increase in time WFH has a positive effect on Dutch knowledge workers' work-life balance; however, this effect is insignificant. H1b was rejected.

The second linear regression for *perceived performance* found the model to be significant, *F(1, 137)* = 5.73, *p* = .018, R^2 = .04, with the amount of time WFH being a significant positive predictor (β = .20, *p* = .018). An increase in time WFH has a significant positive effect on Dutch knowledge workers' perceived own performance. H1c was retained. The regression equation for perceived performance, based on amount of time WFH, is given as:

$$\hat{Y} = 3.755 + 0.014 * (amount\ of\ time\ WFH)$$

In conclusion, while the amount of time WFH has positive effects on all work outcomes, the effect is only significant in the case of perceived performance.

4.2 Mediation of silos perception on WFH amount - work outcomes (H2a-c)

The second hypothesis asserted that perception of silos has a mediating effect on amount of time WFH – work outcomes:

> *H2a-c: Perception of silos by Dutch knowledge workers, mediates the relationship between amount of time WFH and workers' outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance.*

A linear regression was performed between *amount of time WFH* and *perception of silos* – since both variables are of the continuous scale. The model is insignificant, *F(1, 137)* = 2.30, *p* = .132, R^2 = .02, with amount of time WFH being an insignificant, yet negative predictor (β = - .13 *p* = .132). More time WFH actually decrease the silos perceived by Dutch workers, although the extent is insignificant. Since there are no relationship exists between the independent variable and the mediating variable, the mediating effect cannot exist. Hypotheses H2a-c were rejected.

4.3 Moderation of team membership on WFH amount - work outcomes (H3a-c)

The third hypothesis asserted that team membership moderates the relationship between amount of time WFH and work outcomes.

> *H3a-c: Team membership moderates the effect of WFH on workers' outcomes, including a) job satisfaction, b) work-life balance, and c) perceived performance. Dutch knowledge workers in "functional" global teams likely have a stronger positive effect of WFH on workers' outcome, compared to workers not in global teams.*

Since there is no primary relationship between amount of time WFH and job satisfaction or work-life balance, H3a and H3b were rejected.

For hypothesis H3c, the moderating role of team membership was assessed for relationship between *amount of time WFH* and *perceived performance* through regression analysis. First, the effect of team membership (global and non-global/non-functional global) on amount of time WFH was tested through an independent *t-test*. There was no significant difference in amount of time WFH between those in a global team (*M* = 18.56, *SD* = 9.01) and those in a non-global office team (*M* = 16.22, *SD* = 9.44), *t(136)* = 1.48, *p* = .142. This caused the moderating regression model to be insignificant, *F(1, 137)* = 2.29, *p* = .081, R^2 = .05. In this model, both the amount of time WFH (*B* = .01, *p* = .742), team membership (*b* = .11, *p* = .328) and the interaction effect (*B* = .01, *p* = .612) do not have a significant effect on perceived performance by Dutch knowledge workers.

Figure 4.1 graphs the effect of time WFH on perceived productivity, when controlled for team membership. From the graph, it can be seen that being in a global team actually *decreases* the

positive effect of WFH on perceived performance. However, the effect is insignificant; H4c is rejected.

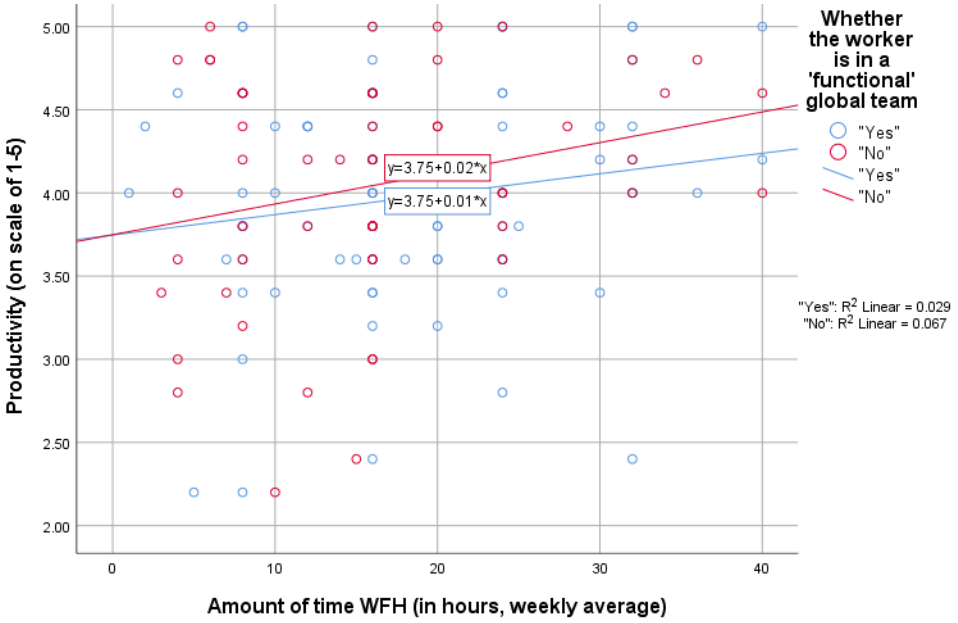

Figure 4.2 Graph of relationship between amount of time WFH and performance, separated by team membership

4.4 Additional results

The relationship between *perception of silos* and work outcomes were explored. First, with *perception of silos* as independent variable and *job satisfaction* as dependent, an ordinal logistic regression analysis was performed. *Perception of silos* was found to significantly contribute to the model (*B* = -1.14, *SE* = .35 , *Wald* = 10.49, *p* = .001). For every one unit increase in silos perception, there is a 213% increase in the odds of being on a lower level of job satisfaction than current level (*95% CI* [1.59, 6.18]). An increase in silos perception has negative effect on job satisfaction, and the effect is significant. For *perceived performance* and *work-life balance* as dependent variables, two respective, separate linear regression were performed. The first linear regression for *perceived performance* found the model to be insignificant, *F(1, 137)* = 0.34, *p* = .563, R^2 = .00, with perceptions of silos being a negative but insignificant predictor (β = - .05 *p* = .563). The second linear regression for *work-life balance* also found the model to be insignificant, *F(1, 137)* = 0.00, *p* = .925, R^2 = .00, again with perceptions of silos being an insignificant predictor (β = - .00 *p* = .925). More siloed communication perceived by Dutch knowledge workers does not lead to poorer work-life balance or self-perceived performance.

To explore whether different amounts of time WFH have different effects on performance, a one-way ANOVA test was performed. For this test, the continuous variable *amount of time WFH* is recoded into subjective frequencies: Low (1 to 8 hours – around one day/week), Medium (9 to 16 hours – around two days/week), High (17 to 24 hours – around three days/week), and Very high

(more than 25 hours – more than three days/week). The result showed that there are no significant differences between groups, *F(3)* = 1.78, *p* = .155. Therefore, amount of time WFH has a strictly linear relationship with performance: More time WFH leads to more productivity.

To test whether any individual demographic variable (age, highest education, employment status, time worked in organization – tenure, organizational size, cluster classification) acts as a moderator for the relationship between amount of time WFH and performance, separate moderating regression analyses were conducted. Prior to the analyses, amount of time WFH is mean centered to avoid multi-collinearity between predictor variables and the interaction term. Only the model for age as a moderator for amount of time WFH and productivity is found to be significant, *F(1, 137)* = 2.13, *p* = .032, R^2 = .13. The effect of WFH amount on productivity in 41-50 years old worker is significantly different from the effect in workers of other groups (*B* = .03, *p* = .023) – this is the only significant difference found in the model. In other words, age is a moderator for the relationship between amount of time WFH and performance – only for the group 41-50 years old is the relationship stronger.

Figure 4.2 presents all result obtained in this research. Dashed lines denote insignificant results, while colored lines/variables denote relationship found outside of hypotheses.

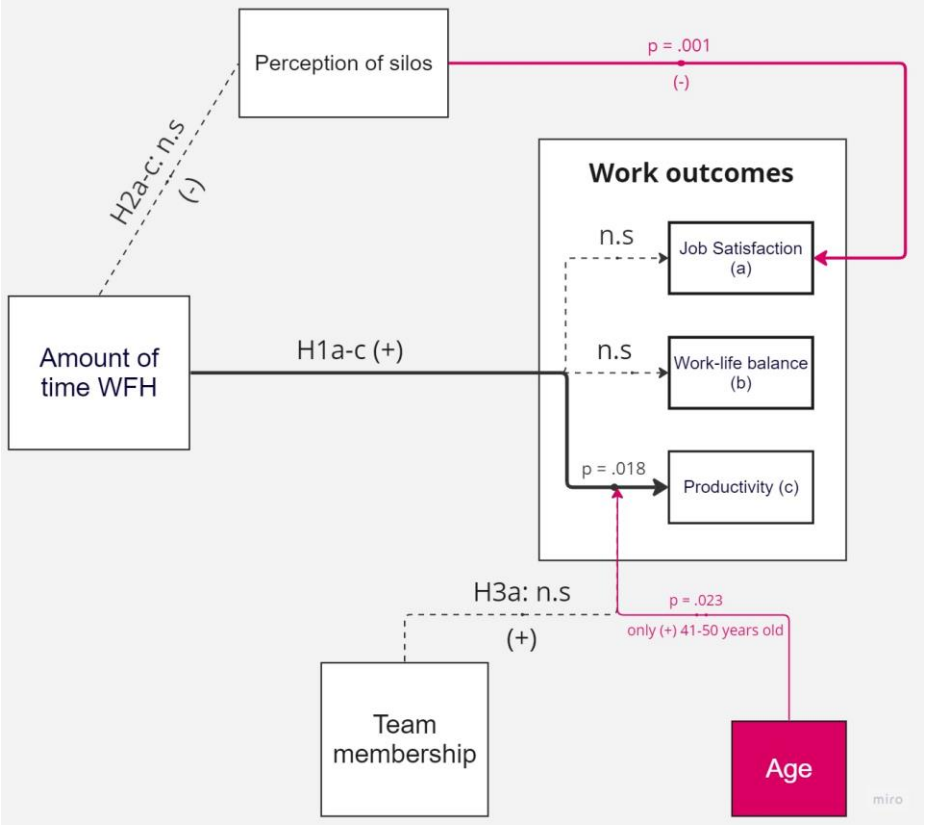

Figure 4.3 Obtained results

5. Discussion

This section discusses the findings of results in Part 4 – Results, comparing results found with insights from previous literature that has formed the hypotheses. Research questions stated at the Introduction will promptly be answered with justification.

5.1. The primary effect of WFH amount on work outcomes

> ***RQ:*** *For knowledge workers in the Netherlands, what is the effect extent of WFH amount on work outcomes after the pandemic?*

Findings suggested that the WFH amount does not significantly affect Dutch knowledge workers' *job satisfaction* or *work-life balance*, and has a very weak effect on *perceived performance*. Although the phenomenon positively affects all three dimensions of work outcomes, the magnitude and extent are small - even unnoticeable in most cases. This result contradicts previous research about WFH, in which job satisfaction had a direct (though small) connection, while work-life balance and performance are indirectly linked to time WFH (see Allen et al., 2015; Yang et al., 2021.)

A plausible explanation for the mismatch may be the higher baseline of work outcomes coming from this sample, compared to previous studies. As explored throughout the introduction and theoretical framework, Dutch knowledge workers have the best working conditions in Europe and worldwide. Even without WFH, the sentiment and measurement of work outcomes among Dutch (knowledge) workers have already shown to be much higher than their counterparts in other countries like the U.S. or Germany. As such, while the amount of time WFH still positively affected the work outcomes, there is little room to improve these already-good aspects. Another explanation can be that Dutch people already had WFH well before COVID-19 made it popular. While workers from other countries might perceive their newly-experienced time WFH as a factor boosting their work outcomes, Dutch workers may have assumed this as a natural part of their work culture – and as such, are less sensitive to its benefits, besides recognizing it as useful for organizing work tasks. This explanation can explain why the WFH amount significantly affects only productivity in this research: WFH's temporal flexibility only improves performance, not work-life balance or satisfaction with work overall.

5.2. Secondary effects of team context – silos and global team membership

Besides the main effect of WFH amount on work outcomes, additional analysis that included *perception of silos* and (global) *team membership* revealed that both contexts do not alter the primary relationship. Once again, given the Dutch culture that emphasizes more on conformity and directness (Gordijn, 2010), being in a global team or feeling different levels of isolation when collaborating hardly affected workers' outcomes – and thus, the relationship between WFH and

outcomes.

***Sub-RQ1**: For the aforementioned workers, to what extent does perception of silos affect the relationship that WFH has on work outcomes?*

Accounting for the silos perception – a notoriously elusive concept (Bento et al., 2020) revealed many interesting insights about the Dutch knowledge worker population. Five organization areas that can make workers feel isolated and separated from collective effort were identified through principal component analysis (PCA) of items previously proposed by De Waal et al. (2019). In the context of WFH and work outcomes, these areas do not score high among Dutch workers – which is a good fact, meaning that the culture of straightforwardness, tolerance, and conformity helped the workers efficiently collaborate. The silos perception score for Sense of community and Working environment is notably higher than other areas (M = 2.48 and M = 2.61, compared to other means around 2) – loosely aligning to the worries of Dutch employers that are seeking to reduce WFH because of "social incohesion." However, findings did not support a relation between WFH and such incohesion: the amount of time WFH had no significant, if not extremely small negative effect on the perception of silos – meaning that WFH more often might make workers feel (very slightly) less disconnected from collective efforts. Based on this finding, WFH and increased struggle when collaborating can be said to be unrelated to each other; at the same time, the mismatch between actual silos (Yang et al., 2020; Zuzul et al., 2021) and perception of silos when WFH puts forward the question of whether employees accurately perceive the isolation of their work. Silos and perception of silos remain elusive concepts; however, as the perception of silos developed in this research for Dutch workers has shown somewhat signs of reliability (through Cronbach's alpha) and validity (through content & convergent validity), there is hope that eventually the concept can be better quantified and generalized in further research.

***Sub-RQ2**: For the aforementioned workers, to what extent does the relationship of WFH and work outcomes differ, between those of global and non-global team membership?*

Interestingly, Dutch workers in 'functional' global teams are not benefitting more from WFH than those not in such teams, in terms of productivity. While the difference is insignificant, it seems that previous familiarity with ICT tools and online working did not accentuate the benefits of WFH in the post-pandemic times. Rather, maybe because 'functional' global workers had experienced some benefits similar to WFH benefits, they are less sensitive to the benefits of WFH. It can also be that (once again) due to the Dutch high baseline of working conditions, teams are not drastically different, and it happens that those in 'functional' global teams do not benefit as much as those not in them.

6. Conclusion

Results from Dutch knowledge workers have shown that WFH amount has positive effect on work outcomes, but only significant in the case of perceived performance; Silos perception and global team membership do not affect the relationship. In the final part of the paper, academic and societal contributions of these findings will be discussed - along with shortcomings and suggestions for future research.

This paper has some contributions to literature regarding WFH and team contexts. Regarding WFH, this research has offered insights into the effect of WFH on work outcomes among Dutch knowledge workers in the post-pandemic period. The mismatch of results compared to previous studies implied that a) country context also matters, as WFH is part of the work culture affected by this context, and b) WFH after the pandemic has continued to develop as a phenomenon, and affect workers in a different way than before. Regarding team context, this research discarded both global team and silos factors; they are irrelevant contexts when considering WFH. However, for the perception of silos, the study has quantified and generalized it into areas of improvement within organizations, which employers can act on. In doing so, this study somewhat helped to define silos – a concept that has academically struggled to be defined and characterized consistently across studies (Bento et al., 2020).

On the other hand, the contributions have been made through a quantitative study, which helps generalize results and make valuable insights for Dutch managers and employers. Through a statistically-informed sampling process aiming to closely represent the working demographic in the Netherlands, results obtained in this study can be firmly generalized for most Dutch knowledge workers who have been WFH since the pandemic. This research will effectively inform employers in negotiating and deciding WFH time for their employees, to create a working schedule that enables win-win results for individuals and the organization. Additionally, the research also shed some light on how WFH could change the team dynamics (or vice versa). Most notably, WFH is not creating the “social incohesion” that employers seek to reduce; instead, it mostly benefitted workers on an individual level. Employers seeking to reform their regulations, therefore, should focus solely on the areas that silos are most perceived by workers. The changes can be made for the team regardless of global team status, but the working environment when offline and the sense of community should be emphasis more on workers connection, to compensate for the time they spent WFH and enjoy personal benefits. WFH should be encouraged and practiced in moderation – to balance between personal and team interactions.

While the study has given useful insights, academically and socially, many drawbacks prevented it from being more meaningful and convincing. First and most prominently, the research

has been limited both in terms of scope and time. These constraints have prevented more insights into the findings that can make the study more meaningful, through means like the inclusion of more organizational concepts, a larger representative sample, or even different aspects of WFH beyond the amount of time (such as working conditions, see Yang et al., 2021.) Secondly, regarding the nature of this study, the results have merely been a snapshot of individual Dutch knowledge workers after the pandemic. The outcomes have been examined on a micro level through individual perception – however, organizational outcomes can come in other levels, namely meso (team outcome) and macro (overall organizational) levels. What is best for employers does not mean the best for employers and organization (otherwise, the conflict of WFH between employees and employers wouldn't have existed) – thus, the effect of WFH on objective team or organizational outcomes should be explored alongside subjective employee perceptions. Finally, this research has revealed a bigger question that did not get tackled here: Which factors would affect WFH and work outcomes of knowledge workers the most? Significant findings from the main variables of this study did not explain variance in the population well, until age was included as a moderator variable. This implies that many other factors can explain and provide context into the relationship between WFH and work outcomes.

Considering these shortcomings, it is clear that there are many opportunities for future research regarding WFH. Starting with research that would continue to concern individual effects of WFH amount on work outcomes, improvements in research design can be made to make findings more meaningful. A cross-national study comparing Dutch workers with other countries will provide insights into the extent to which culture affects WFH generalizability; a longitudinal study can examine whether Dutch working culture is resilient towards WFH effects over time. Additionally, including other individual/team factors or different work dimensions can help explain and explore how diverse backgrounds of workers constitute various perceptions, thus making the results more generalizable. If future research wishes to examine a larger picture of WFH, it can compare WFH amount with other aspects (such as arrangements, and familiarity) in effectively determining work outcomes. Alternatively, they can examine the effect of WFH amount of outcomes on team and organizational levels, if they have access to company records or can conduct a large-scale study.

Regardless of the future research direction, WFH – popularized by the pandemic and a staple of our work culture - will continue to be a topic ripe with research angles and relevant implications, as more people experience it and make the phenomenon our future of work.

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Appendix A. Hierarchical clustering analysis of sample & obtained results

Clustering analysis is a data mining technique, in which "data objects are classified into groups based on information found from the objects" (Tan et al., 2019, p.528). The goal of cluster analysis is to form groups (or clusters) in which objects within the group are similar to each other, and objects in different groups are distinctly different from each other. In this research, the goal of performing a cluster analysis is to group Dutch knowledge workers with similar demographic and measured-behavior together, thus uncovering overall patterns of the sample and infer to the working population.

Cluster analysis can be used on a large sample to obtain accurate inferential results; however, a representative sample also works in favor of the technique. As established in Section 3.2 (Survey Design), the sample size of 138 is adequate for the sample to have measurements within $\pm$5% of actual results. Because of this, a cluster analysis can be performed with generalizable results. Appendix A1 presents variable used to perform the cluster analysis, including name, description, measurement level, and relevant notes.

Appendix A.1

Summary of variables used in cluster analysis

Variable	Description	Measurement level	Notes
Language	The language that a participant used to complete the survey *[English, Dutch]*	Nominal	
Age	Age range of participant *[20-30; 31-40; 41-50; 51-60; 60+]*	Ordinal	Ordered in ascending age ranges
Education	Highest (equivalent) degree that participant have or will obtain *[HBO, WO, Masters, Doctoral]*	Ordinal	Ordered as HBO < WO < Masters < Doctoral
Employment status	Current employment status of participant *[Full-time, Part-time, Internship]*	Nominal	
Tenure	Time that participant spent working at current organization *[<1 year, 1-2 years, 3-5 years, 6-10 years, >10 years]*	Ordinal	Ordered in ascending tenure
Organization size	Size of participant's current organization *[1-9, 10-49, 50-249, 250+]*	Nominal	
Team membership	Whether participant is in 'functional' global team *[Yes, No]*	Nominal	
Time WFH	Amount of time a participant spends WFH in a week, on average	Continuous	
Satisfaction	Score indicating participant's satisfaction with work	Continuous	
Performance	Score indicating participant's self-perceived	Continuous	

	performance	
Work-life balance	Score indicating participant's work-life balance	Continuous
Silos	Score indicating participant's silos perception (across 20-selected items)	Continuous

For performing cluster analysis, a disimilarity matrix for all pairs of participants in the sample is first calculated. Between a pair of participants, a disimilarity score indicates how much different the two are from each other – the score ranges from 0 (identical) to 1 (most different in sample). For calculating disimilarity matrix with mixed data levels, Gower's distance formula (1971) is used. For a pair of participants x_1 & x_2, their disimilarity score is:

$$D_{gower}(x_1, x_2) = \sum_{j=1}^{j} s_j(x_1, x_2) * weight\ of\ j$$

The similarity score s_j of x_1, x_2 is calculated differently, based on the measurement level of variable j:

- If j is a nominal variable, then s_j = 0 if x_1, x_2 do not have the same value of j, and $s_j = 1$ otherwise.
- If j is an ordinal variable, then $s_j = \frac{|category\ number\ of\ x_1 - category\ number\ of\ x_2|}{number\ of\ categories - 1}$ in j.
- If j is a continuous variable, then $s_j = \frac{|score\ of\ x_1 - score\ of\ x_2|}{largest\ value - smallest\ value}$ in j.

The weights in dimension/variable j is at discretion of researcher, and total of weights for all variables should add up to 1. In the context of this research, we want to group Dutch knowledge workers into groups and find the patterns within groups, as well as differences between groups. Therefore, demographic variables were assigned heavier weights ($\frac{3}{26}$ for each variable) than measured variables ($\frac{1}{26}$ for each variable).

After the dissimilarity matrix has been calculated, a hierarchical clustering process with **complete** linkage method was performed (Tan et al., 2019, p.898). The following is a description of the algorithm:

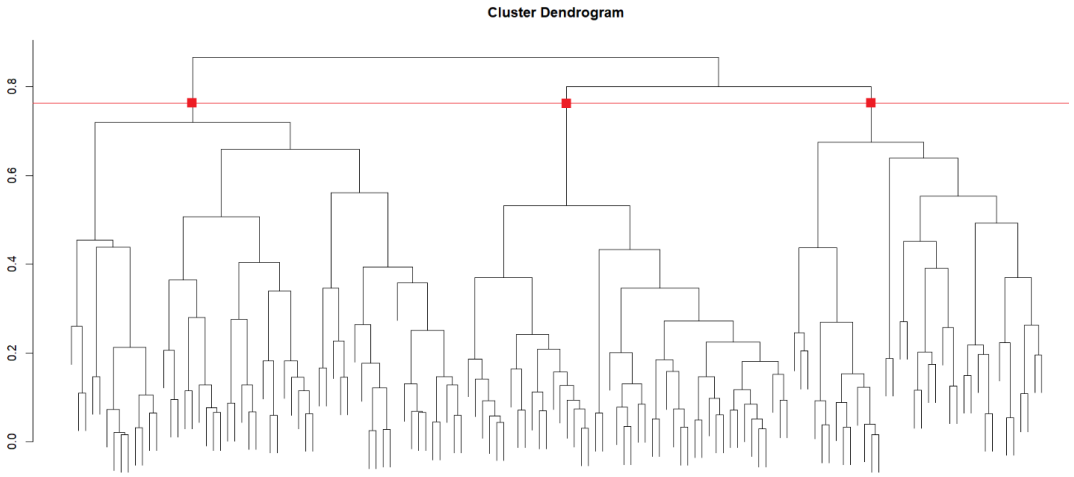
- Step 1: Across all dissimilarity score, two objects k_1, k_2 with lowest score is added into one cluster Z.

- Step 2: The cluster Z, now containing objects z_1, z_2, is treated as an object k. Its distance to other objects not in cluster is calculated by **using the highest distance score across z_1, z_2** to each object k_{n-2}.
- Step 3: Repeat step 1 & 2 until all objects belong to one cluster, after which ends the process.

Appendix A.2 presents a visualization of the process. The number of clusters is determined by reasonably "cutting across" the chart, revealing the number of clusters that are substantially different from each other. Based on the visualization, an appropriate number of clusters of the sample is 3.

Appendix A.2

Distance visualization and decision to form clusters



Each object is then categorized into one of the three cluster. Appendix A.3 summarizes statistics and notable information regarding the clusters.

Appendix A.3

Summary of clusters' descriptive statistics.

	Cluster 1	Cluster 2	Cluster 3
Count	46	36	56
Age	**Middle-young: 20-40** (87%)	**Middle-old: 31-50** (61.1%)	**Young: 21-30** (92.9%)
Education	**Master & Doctoral** (63%)	**HBO & WO** (80.6%)	**HBO & Master** (82.1%)
Employment	**Full-time**	**Primarily full-time** (80.6%)	**Dominantly part-time** (64.3%)
Language	**EN** (46)	**NL** (33)	**EN** (42)

Time in org	**Medium: 1-5 years** (67.4%)	**Long: >= 6 years** (52.8%)	**Short: =<2 years** (82.1%)
Size of org	**Large: 50 - 250** (87%)	**Medium (10-49) & Large** (80.6%)	**Diverse**
Global team?	**Yes** (45)	**Likely no** (10-26)	**Unclear** (25-31)
Amount of time WFH	20.93 [10.21]	17.47 [8.38]	14.9 [8.1]
Perception of Silos	2.24	2.36	2.19
Satisfaction	4.15	4.28	4.20
Performance	4.07	4.02	3.95
WLB	3.80	3.63	3.65
Labels	**International workforce**	**Traditional Dutch workforce**	**Young Dutch workforce**

Based on the description of clusters, it can be seen that perception of silos, satisfaction, performance and work-life balance do not drastically differ across different fractions of the Dutch workforce (all one-way ANOVA tests returned insignificant difference of $p > .05$). The amount of time WFH is also significantly different for international workers and young Dutch workers. There are also no clear connection between being in a global team and having better outcomes when comparing between these clusters – again confirming that team membership does not moderate the relationship between WFH and work outcomes.

Some additional insight into the labor market can be inferred from the sample's cluster: International workers in the Netherlands need to commit full-time to their companies (likely due to permit regulations), whereas Dutch workers can, and are increasingly choosing to have flexibility in employment status. Most international workers in the Netherlands work in large, international companies – while this is less predictable for the other group of Dutch workers. Finally, international knowledge workers are more likely to pursue higher education (Masters primarily) as signaling for their employers. Young Dutch knowledge workers usually choose between two routes: HBO or WO to Masters, while older workers (many of which could have graduated before the system reform in the Netherlands) mostly obtain degree in HBO followed by WO.

Appendix B. Survey questionnaire

Start of Block: Intro

Intro text Working-from-home and Outcomes survey
(Scroll to the end to skip intro)

Dear respondents,

Thank you for your participation in this survey. The survey forms part of student's Bachelor Thesis project at Erasmus School of History, Culture and Communication [Erasmus University Rotterdam]. In this project, we explore the relationship between **working-from-home** [hereby abbreviated as WFH] **after the pandemic and working outcomes;** as well as factors affecting this relationship. Findings from this study can help inform us on how to be more effective, happy, and balanced when working in "new normal" conditions.

This survey, in particular, aims to explore perceptions of WFH after the pandemic, collaboration quality, and work outcomes by Dutch-related knowledge workers. *Knowledge workers are high-level workers that complete tasks by applying theoretical and analytical insights they acquired through formal training*. **You will be asked how you are feeling about current collaboration and working results, along with some information about your working conditions**. The entire survey will take approximately 7-10 minutes of your time.

The survey data will be used for research purposes only. Responses are kept strictly confidential - meaning that only researchers involved in the project will be able to access your response, and they will not share your response with third parties or retain your response beyond the duration of research. Your response is also anonymous, no information can be tracked back to you as an individual. If you decide to participate in the referral initiative, you will be redirected to another separate form for contact information - your survey response, however, will remain anonymous.

We appreciate your honest thoughts that will greatly help the research process. If you have any questions about the research, you are welcome to contact the project leader, Khanh Chu, at [554897cn@eur.nl]. Are you interested in WFH, and want to gain more valuable insights into the phenomenon? Please help us out by referring your family, friends and colleagues to fill in this survey - as more people provide their thoughts, our results are more generalizable. As a thank you for your interest, **our referral initiative** would like to buy you a cup of coffee - more information towards the ending of this survey.

**Amazon Mechanical Turk respondents: You need to complete a valid response for the survey code. Only valid responses can be used for research and are eligible for earning. If you did not complete a valid response, there will be a note reminding you at the end screen.*

Please click on "Next page" to begin. By continuing, you consent to participating in the survey and the research - although you can stop at any time, and your response will not be recorded.

End of Block: Intro

Start of Block: Referral & Demographic

If you have a referral code from a friend/colleague, please provide it here.
If you don't have a referral code, please skip this question.

_____

What is your age?

- ○ 20-30 (1)
- ○ 31-40 (2)
- ○ 41-50 (3)
- ○ 51-60 (4)
- ○ 60+ (5)

What is the highest level of (equivalent) degree you have obtained, or are currently obtaining?

- ○ Secondary/Highschool degree (1)
- ○ Vocational degree (MBO) (2)
- ○ University of Applied Science degree (HBO) (3)
- ○ Research university's degree (WO) (4)
- ○ Master degree (5)
- ○ Doctoral degree (6)

Which status best describes your current employment status?

- ○ Full-time employed (1)
- ○ Part-time employed (2)
- ○ Contractually (pay-per-hour) employed (3)
- ○ Self-employed (4)
- ○ Internship (5)
- ○ Voluntary work (6)
- ○ Unemployed/Studying (7)

Are you an employee of a Dutch-related organization?
Please answer "Yes" if:
- You work in the Netherlands, OR
- You work somewhere else, but report directly to an organization that has its headquarters in the Netherlands, OR
- You work somewhere else, but report to a team that operates in the Netherlands market.

- ○ Yes (1)
- ○ No (2)

How long have you been working in your current organization?

- ○ <1 year (1)
- ○ 1-2 year (2)
- ○ 3-5 year (3)
- ○ 6-10 year (4)
- ○ >10 year (5)

Not including subsidiaries, how many employees does your organization currently employ?

- ○ 1-9 (1)
- ○ 10-49 (2)
- ○ 50-249 (3)
- ○ 250+ (4)

When you go to your work office, which of the following statement best describes the nature of your work?
This question only concerns your office locations - unless you work only from home, please do not consider home as one of your work locations.

- ○ I go on the road/travel between many different (office) locations (1)
- ○ I work in one or two fixed office location(s) (2)
- ○ I only work from home (3)

End of Block: Referral & Demographic

Start of Block: WFH & Global team

In your current organizations, have you ever worked in a global team?
Please answer "Yes" only if you satisfy all of the below:

- Working closely with (a set of) colleagues in the organization for a goal, AND
- At least one member in the team does not work in the same office as you, AND
- The team consists of two or more nationalities.

○ Yes (1)

○ No (2)

If you have worked in a global team before, how would you rate the average quality of team(s)?
If you have not, please select "N/A"

○ Bad (1)

○ Not so good (2)

○ Good (3)

○ Very good (4)

○ N/A

Since the pandemic, have you ever (partially) replaced working at the office with working from home?
Please note that working extra hours at home after a workday is not considered working from home.

○ Yes (1)

○ No (2)

On a normal workweek, how many hours do you spend working from home instead of working at the office?
Please provide a number only (e.g: 16). If the amount of hours is not consistent, please calculate the latest month's total and divide by 4, rounded. A normal workday equals to 8 hours.

_____

End of Block: WFH & Global team

Start of Block: Organizational Silos - 1

*Note: The following questions ask you to think about collaboration in your organization. If you are working in a large organization, please think about collaboration between teams of your **specialized department** instead (e.g Marketing, HR, Product, etc.)*

Please indicate the extent to which you agree with the following statements:
I believe that my organization…

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Promotes and support collaboration (1)	○	○	○	○	○
Promotes a shared identity between organization employees (2)	○	○	○	○	○
Promotes a mindset of collaboration between organization employees (3)	○	○	○	○	○
Creates shared goals that employees can work on together (4)	○	○	○	○	○

Please indicate the extent to which you agree with the following statements:
I believe that between teams in my department/organization, we have…

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Clear roles, responsibilities, goals, tasks, and outcomes (1)	○	○	○	○	○
A standardized way of working for teams (2)	○	○	○	○	○
An overall way of working in which all teams play a role (3)	○	○	○	○	○
Plannings and/or reviews in which different teams are involved (4)	○	○	○	○	○
Shared product/service(s) provided for customers (5)	○	○	○	○	○
Programs and projects for collaboration between individuals (6)	○	○	○	○	○
Time and space for experimentation (7)	○	○	○	○	○
Methods to deal with conflicts and disagreement (8)	○	○	○	○	○
Measures for the success of our collaboration (9)	○	○	○	○	○

A shared communication system/IT platform (10)	○	○	○	○	○
Information sharing through one platform (11)	○	○	○	○	○

End of Block: Organizational Silos - 1

Start of Block: Organizational Silos – 2

Please indicate the extent to which you agree with the following statements:
I believe that the environment in my department/organization…

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Has equal treatment for teams (1)	○	○	○	○	○
Has communication flows to share about team goals, plans and results (2)	○	○	○	○	○
Has information about other teams' goals and status (3)	○	○	○	○	○
Has communities/networks to share knowledge, best practice and experience (4)	○	○	○	○	○
Has cross-team training and events to foster professionalism between teams (5)	○	○	○	○	○
Has a physical space where we can meet colleagues (6)	○	○	○	○	○
Encourages spending time with people from other teams (7)	○	○	○	○	○
Has an informal setting where colleagues can get to know each other (8)	○	○	○	○	○

Please indicate the extent to which you agree with the following statements:
I believe that the managers of my department/leaders of my organization are...

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Taking responsibility for their area of expertise, and share responsibility in other areas (1)	○	○	○	○	○
Making sure the leaders have collaborative behavior (2)	○	○	○	○	○
Developing their interpersonal skillsets to collaborate and network (3)	○	○	○	○	○

Please indicate the extent to which you agree with the following statements:
I believe that in the department/organization, my team…

	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
Recruits colleagues that is collaborative and open to networking (1)	○	○	○	○	○
Provides trainings for collaboration and networking (2)	○	○	○	○	○
Gives people authority and accountability when working together (3)	○	○	○	○	○
Adapts evaluations and incentive systems to encourage collaboration with other teams (4)	○	○	○	○	○
Acknowledges and rewards individuals that effectively work with other colleagues/teams (5)	○	○	○	○	○

End of Block: Organizational Silos - 2

Start of Block: Workers' outcomes

The following questions ask you to think about how you feel regarding work since you have started ***working from home after the pandemic.***

Perceived Performance Please indicate the extent to which you find the following statements accurate:
Since I started to (partially) work from home after the pandemic,...

	Definitely not true (1)	Probably not true (2)	Neither true nor false (3)	Probably true (4)	Definitely true (5)
I managed to plan my work so that it was done on time (1)	○	○	○	○	○
I had an optimal planning (2)	○	○	○	○	○
I kept in mind the result that I had to achieve in my work (3)	○	○	○	○	○
I was able to separate important tasks from side tasks at work (4)	○	○	○	○	○
I was able to perform my work well with minimal time and effort (5)	○	○	○	○	○

Work-life balance Please indicate the extent to which you find the following statements accurate:
Since I started to (partially) work from home after the pandemic,...

	Definitely not true (1)	Probably not true (2)	Neither true nor false (3)	Probably true (4)	Definitely true (5)
I have good balance between time I spend for work and time I spend for other activities (1)	○	○	○	○	○
I have difficulty balancing my work and non-work responsibilities (2)	○	○	○	○	○
The balance between work and non-work responsibilities feels right to me (3)	○	○	○	○	○
Overall, my work and non-work life are balanced (4)	○	○	○	○	○

Satisfaction Please indicate the extent to which you find the following statements accurate:
Since I started to (partially) work from home after the pandemic,...

	Definitely not true (1)	Probably not true (2)	Neither true nor false (3)	Probably true (4)	Definitely true (5)
I am satisfied with my current work situation (1)	○	○	○	○	○

End of Block: Workers' outcomes

Start of Block: Ending remarks

Would you like to provide any further comments?
Long comments/suggestions can be sent to the project leader at [554897cn@eur.nl]

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Are you filling this survey for incentives from another platform?

○ Yes, Amazon Mechanical Turks (1)

○ Yes, Prolific (2)

○ Yes, SurveyCircle (3)

○ No (4)

Refer this survey to other workers and receive €15! For every 7 valid, unique responses that uses your referral code, you will be rewarded with €15 in cash credit. If you would like to participate, you will be lead to a different survey to generate your referral code - your response will remain anonymous.
Would you like to participate in the referral program?

○ Yes (1)

○ No (2)

End of Block: Ending remarks