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# Remote work and its effects on workplace well-being: Results from a Norwegian panel study

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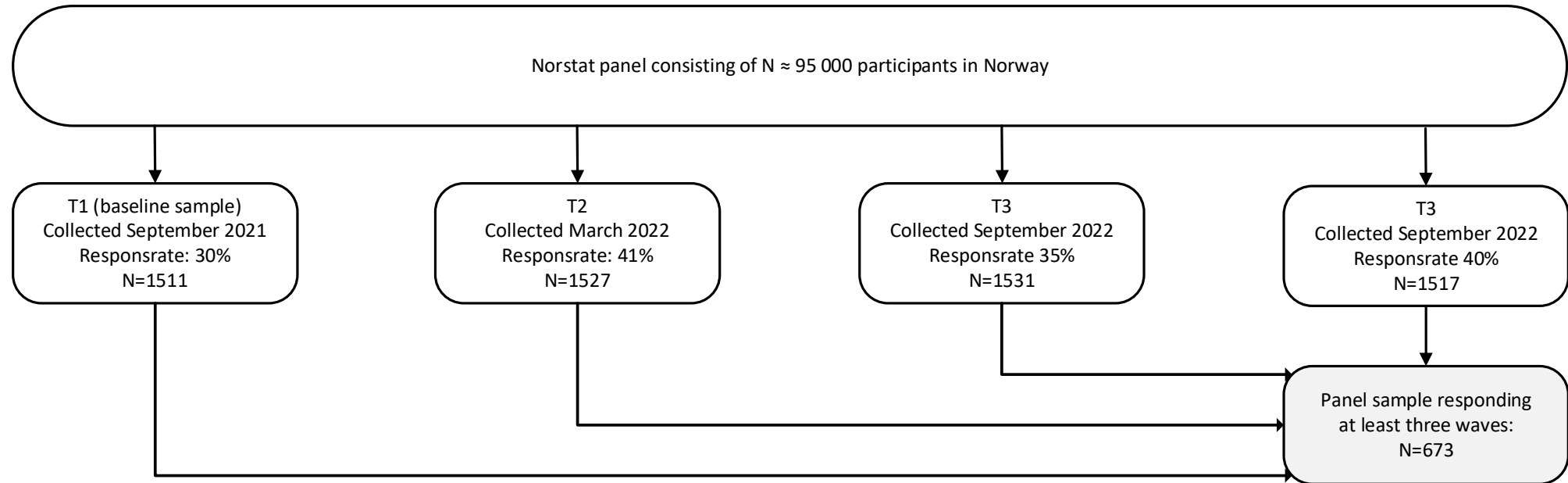


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# Team



# Data: Current status

## Norwegian work life panel with four waves

- Data selection procedure:
  - Data was collected by a professional market research company: Norstat Norway.
    - Time points
      - September 2021
      - March 2022
      - September 2022
      - September 2023
  - Heterogenous sample representing Norwegian workers
  - Panel design
    - Each wave also function as a new baseline
  - Define studies/papers based on study aims – many possibilities...

Theoretical  
framework  
and measures  
Examples

- Conservation of Resources Theory
- JD-R model
- 200+ variables
  - Work characteristics (JD-R)
    - Including digitalisation
    - Work climate
    - Bullying
  - Outcomes and performance measures
  - Big Five
  - Demographic characteristics

# Sample (3 out of 4 waves)

	n	%
<b>Gender</b>		
Female	270	40.1%
Male	403	59.9%
<b>Age</b>		
20–24	20	3.0%
25–39	207	30.8%
40–54	227	33.7%
55–66	164	24.4%
67–74	55	8.2%
<b>Household gross income</b>		
≤ 500,000 NOK	69	10.3%
500,001–1,000,000 NOK	247	36.7%
1,000,001–1,500,000 NOK	225	33.4%
> 1,500,000 NOK	63	9.4%
<b>Employment status</b>		
Full-time employee	587	87.2%
Part-time employee	86	12.8%
<b>Managerial responsibility</b>		
Yes	183	27.2%
No	480	71.3%
<b>Total</b>	<b>673</b>	<b>100.0%</b>

# Remote work and digitalisation scales

## From T1-T4

- **Home office and digitalization, Grødem, 2020**
- **Digital tools, Grødem, 2020**

## NEW MEASUREs AT T4

- **Home office: 1 item**
  - How many days do you work from home during a typical workweek?
- **Digital leadership: 5 items, e.g.**
  - My manager makes employees aware of risks associated with information technology
- **Techno-exhaustion: 4 items, e.g.**
  - I feel drained from activities that require me to use technology.
- **Techo-overload: 5 items, e.g.**
  - I have been forced to work much faster with the new technology.
- **Artificial intelligence: 1 item**
  - Artificial intelligence increases the likelihood that I will lose my job within 2 years.

## Refs in:

Singh, P., Bala, H., Dey, B. L., & Filieri, R. (2022). Enforced remote working: The impact of digital platform-induced stress and remote working experience on technology exhaustion and subjective wellbeing. *Journal of Business Research*, 151, 269-286.

Article

# The Influence of Remote Work on Personality Trait–Performance Linkages: A Two-Wave Longitudinal Study

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**Abstract:** Few studies have investigated how remote work influences personality trait–performance linkages over time in heterogeneous work populations. Hence, the aim of this study was twofold: (1) to explore the predictive validity personality traits have on work behaviour (work engagement and innovative work behaviour) and occupational health outcomes (general health and sick leave); (2) to explore how remote work potentially moderates the trait–performance linkage. Panel survey data from a Norwegian work–life barometer panel research project was employed, and the time lag was one year. The results indicated that the Big Five was consistently related to work behaviour

# The Impact of Remote Work on Personality and Performance

This article explores the link between personality traits and work performance in a remote work setting.

## Background

- The COVID-19 pandemic rapidly increased remote work, which presented new challenges.
- Remote work can affect individuals in various ways, impacting social interaction, well-being, and work-life balance.
- Specific personality traits, like extroversion and conscientiousness, may influence how well someone adapts to remote work.
- Limited Research:** Existing studies haven't fully explored the long-term effects of remote work on different personality types and performance.
- Need for Further Research:** More longitudinal studies with diverse participants and performance measures are needed, especially outside of crisis situations like the pandemic.



# The study...

## **Aims**

- Investigate how personality traits relate to work behaviors and health outcomes in remote work.
- Understand if remote work moderates these relationships (i.e., does remote work change the impact of personality on performance?).

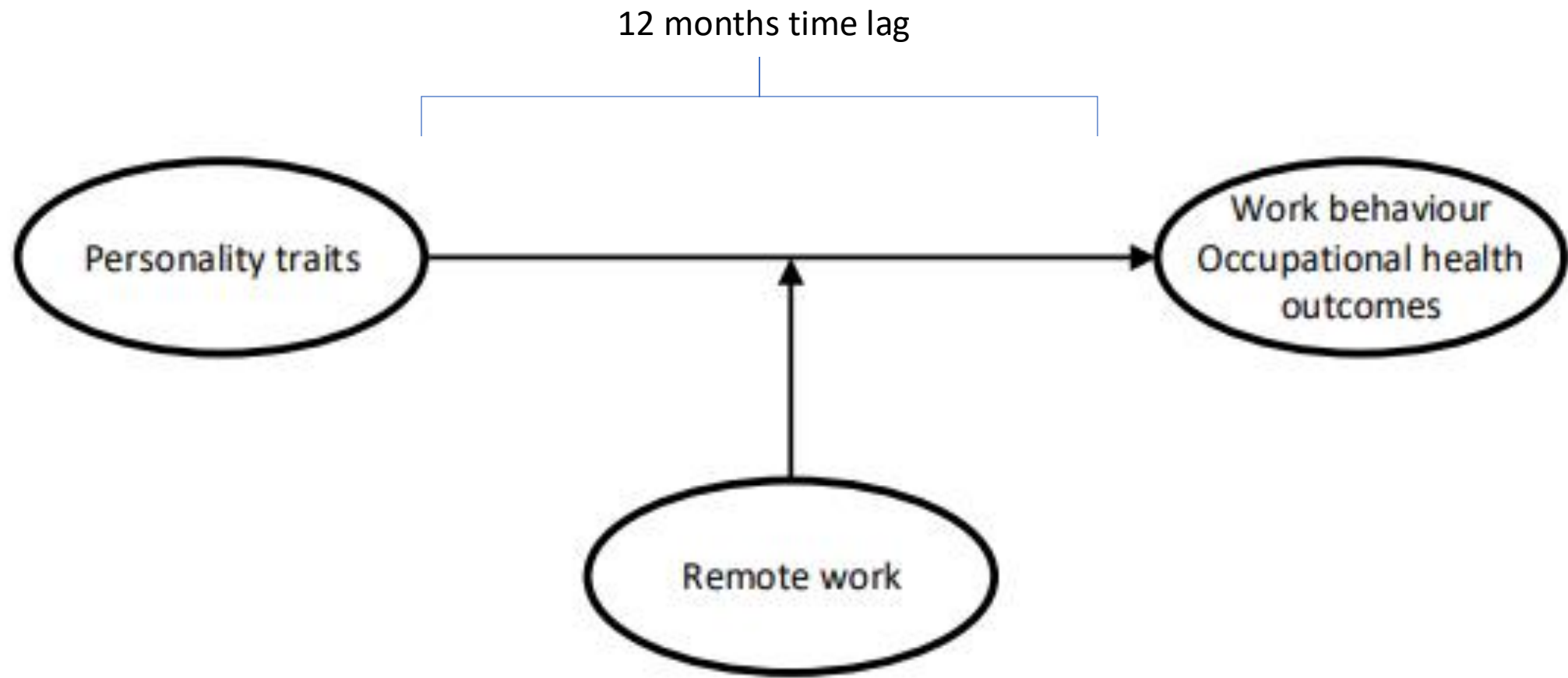
## **Outcomes**

- **Work behaviors:** work engagement and innovative work behavior.
- **Health outcomes:** general health and sick leave.

**Overall, the research aims to improve our understanding of how remote work affects people with different personalities and how it impacts their work performance and well-being.**

# Participants and Procedures


- Data from this study were polled from an ongoing longitudinal work–life panel study in Norway.
- Specifically, data from the third and fourth waves was employed and labelled T1 (September 2022) and T2 (September 2023) in the current study.
- The samples used in this study include the **801 respondents** who completed the survey at **both** T1 and T2 (Table 1).
- The selection of these two waves was based on two methodological considerations: (1) the time lag was 12 months and (2) we improved the measurement of remote work **reflecting behaviour instead of attitudes**.




**Figure 1.** Research model of the current study.

# Hypotheses

Hypothesis 1. Conscientiousness, extraversion, intellect/imagination, and agreeableness positively influence work behaviour and occupational health.



Hypothesis 2. Neuroticism negatively influences work behaviour and occupational health.



Hypothesis 3. Remote work reduces the positive influence conscientiousness and extraversion have on work behaviour and occupational health.

# Research Question

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- A recent review (Blank et al. 2023) concluded that **“the current evidence base is not strong enough to determine whether certain individual factors are most important in the pathway between home working and health outcomes, and there is a further lack of evidence to determine which groups within a population might be at greatest risk of negative outcomes”** (Blank et al. 2023, p. 77).
- Since there are few studies on how remote work potentially moderates the influence neuroticism, intellect/imagination, and agreeableness have on work behaviour and occupational health, the following research question was formulated:
  - **Research Question 1. Does remote work moderate the influence neuroticism, intellect/imagination, and agreeableness have on work behaviour and occupational health?**

**Table 1.** Demographics.

	n	%
Gender		
Female	365	45.6%
Male	436	54.4%
Age		
20–24	13	1.6%
25–39	267	33.3%
40–54	276	34.5%
55–66	203	25.3%
67–74	42	5.2%
Education		
Primary and lower secondary school	15	1.9%
Secondary school (incl. former vocational school)	100	12.5%
Vocational school and other 1–2 year programmes after upper secondary school	145	18.1%
University/college up to 3 years (bachelor’s degree)	250	31.2%
University/college 4 years or more (master’s degree and higher)	287	35.8%
Other	4	0.5%
Remote work		
0 day per week	523	65.9%
1 day per week	128	16.1%
2 days per week	81	10.2%
3 days per week	28	3.5%
4 days per week	13	1.6%
5 days per week	21	2.6%
Total	801	-

## MEASURES

- The **Big Five factors** of personality were measured using the adapted version of MiniIPIP (Donnellan et al. 2006), including five subscales: extraversion (4 items—e.g., “Am the life of the company”), agreeableness (4 items—e.g., “Sympathise with others’ feelings”), conscientiousness (4 items—e.g., “Get things done right away”), neuroticism (4 items—e.g., “Have frequent mood swings”), and intellect/imagination (4 items—e.g., “Have a vivid imagination”). Items were scored on a 5-point Likert-type scale ranging from 1 (very wrong) to 5 (very correct). In terms of internal consistency ( $\alpha$ ) at Time 1, extraversion was 0.82, agreeableness was 0.82, conscientiousness was 0.66, neuroticism was 0.75, and intellect/imagination was 0.77.
- **Work engagement** was measured using the UWES-3 scale (Schaufeli et al. 2019) with three items. A sample item is “I am immersed in my work”. Items were scored on a 5-point Likert-type scale ranging from 1 (completely disagree) to 5 (completely agree). The internal consistency ( $\alpha$ ) was 0.83 at Time 2.
- **Innovative work behaviour** was measured using a 9-item scale, including three stages of innovation in the workplace: idea generation (3 items—e.g., “Creating new ideas for improvements”), idea promotion (3 items—e.g., “Mobilising support for innovative ideas”), and idea realisation (3 items—e.g., “Evaluating the utility of innovate ideas”) (Van der Vegt and Janssen 2003). Items were scored on a 5-point Likert-type scale ranging from 1 (never) to 5 (always). In terms of internal consistency ( $\alpha$ ) at Time 2, idea generation was 0.83, idea promotion was 0.89, and idea realisation was 0.87.
- **General health** was assessed with a single-item measure (“How is your health in general?”), an approach found not only easily manageable for survey respondents but also a valid and reliable method for measuring general health (DeSalvo et al. 2006; Macias et al. 2015). Items were scored on a 5-point Likert-type scale ranging from 1 (very bad) to 5 (very good).
- **Sick leave** was measured with one item: “How many days in total have you been away from work and on reported sick leave during the previous 12 months?” (Aronsson and Lindh 2004). The responses were scored on a five-point response scale: 1 = (None); 2 = (fewer than 6 days); 3 = (6–10 days); 4 = (11–23 days); 5 = (More than 24 days). The response scale was treated as a continuous variable in this study.
- **Remote work** was constructed in the research project and measured with one item: “How many days do you have a home office during a normal working week?”. The measure reflects remote work behaviour, not remote work attitude, which was the intention. The responses were scored on a five-point response scale: 0 = (none); 1 = (1 day per week); 2 = (2 days per week); 3 = (3 days per week); 4 = (4 days per week); 5 = (5 days per week). The response scale was treated as a continuous variable in this study.
- **Control variables** in this study include age, gender, and education at Time 2

# Data Analysis

- Structural equation modeling (SEM) using Mplus 8.3 (Muthén and Muthén 2017) was conducted.
- Descriptive statistics and confirmatory factor analysis (CFA) across different waves were examined in preliminary analysis.
- Parameters in this study were estimated using maximum likelihood estimation, and missing data were handled using full information maximum likelihood to decrease bias (Enders 2001).
- Finally, to examine the moderating role of remote work at Time 2 related to Big Five factors of personality at Time 1 and outcomes (i.e., behaviour and general health) at Time 2, a latent moderated structural equation (LMS) approach (Klein and Moosbrugger 2000) was conducted using the XWITH command in Mplus 8.3 software.
- Interaction effects were visualised and tested using established recommendations (Aiken et al. 1991; Cohen et al. 2013).
- Age, gender, and education at T2 were used as control variables to examine the robustness of the results.

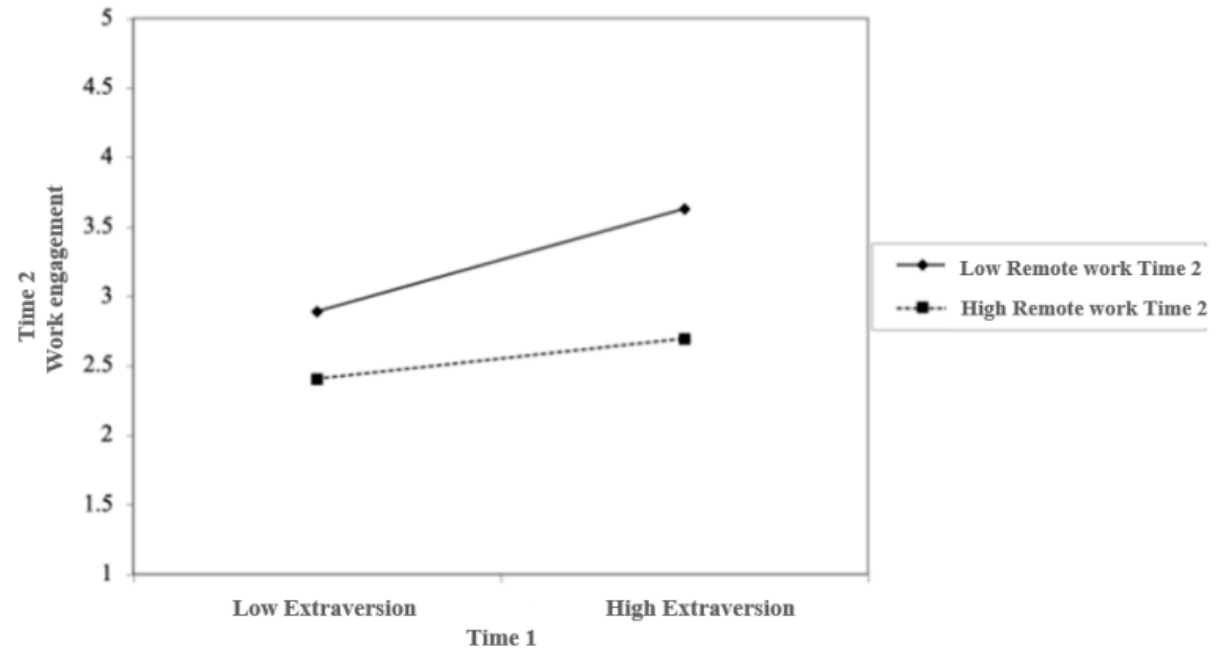


**Table 3.** The relationship between Big Five at Time 1 and related outcomes at Time 2.

Predictor (Time 1)	Outcome (Time 2)							
	Behaviour				Worker Health			
	Work Engagement		Innovative Work Behaviour		General Health		Sick Leave	
	B	$\beta$	B	$\beta$	B	$\beta$	B	$\beta$
Agreeableness	0.10	0.09	0.08	0.09	-0.07	-0.06	0.19 *	0.11
Extraversion	0.28 ***	0.25	0.21 ***	0.26	0.17 ***	0.16	-0.04	-0.02
Conscientiousness	0.11 *	0.11	0.01	0.01	0.11 *	0.11	-0.04	-0.02
Neuroticism	-0.18 **	-0.16	-0.06	-0.07	-0.23 ***	-0.21	0.38 ***	0.23
Intellect/imagination	<0.01	<0.01	0.10 **	0.13	-0.10 *	-0.09	0.06	0.04
Control variables								
Age	0.01	0.05	-0.01 **	-0.10	-0.01	-0.03	-0.01	-0.01
Gender	-0.10	-0.05	-0.13 **	-0.10	-0.07	-0.04	0.38 ***	0.15
Education	0.05	0.07	0.05 *	0.08	0.12 ***	0.15	-0.10 *	-0.08

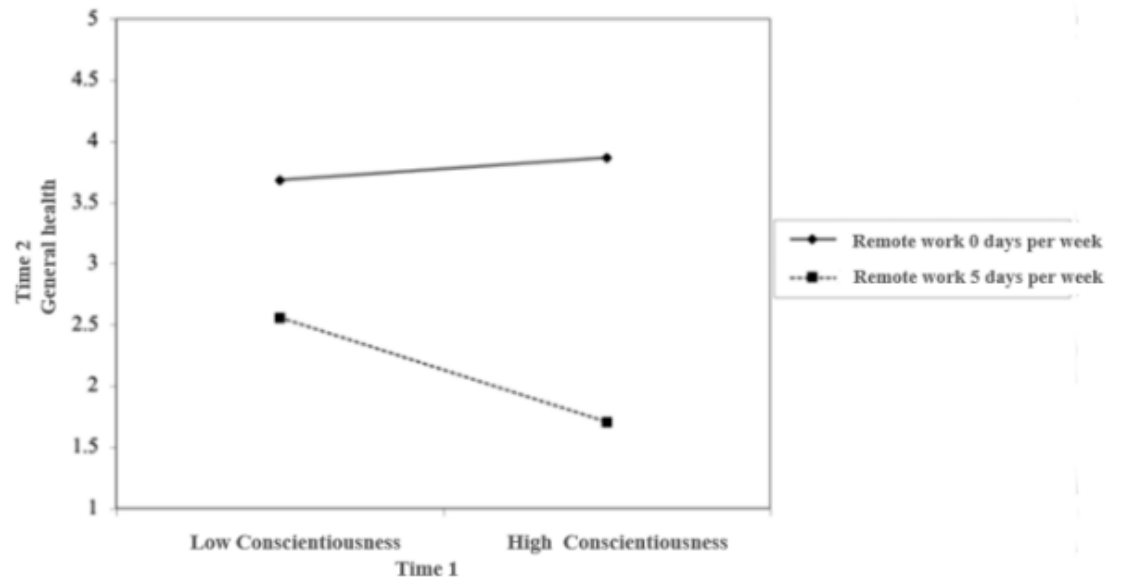
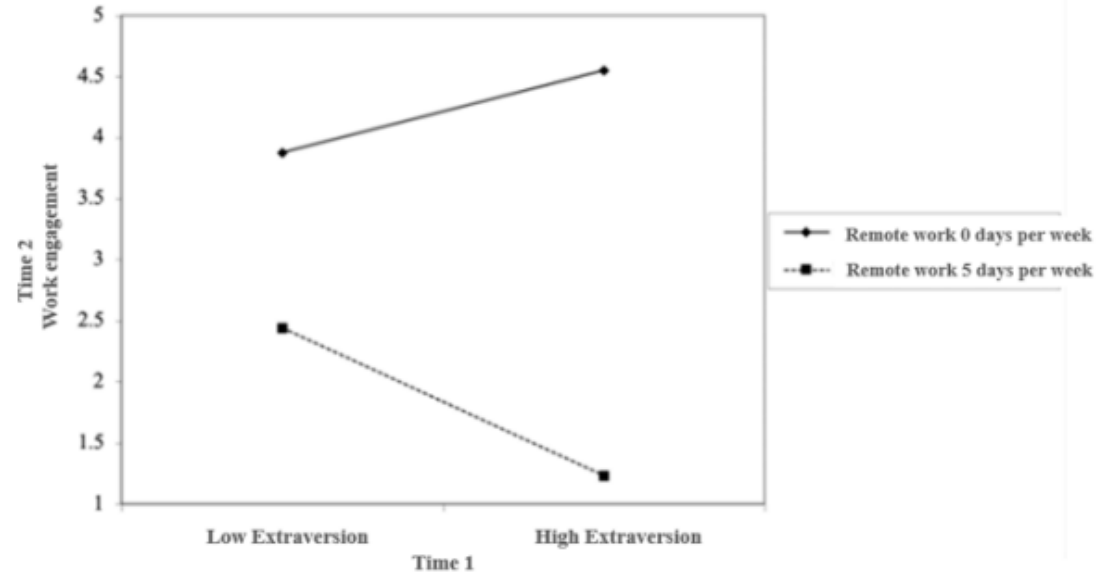
Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . Gender: 1 = male, 2 = female. Control variables are measured at T2.

# MODERATION



**Figure 2.** Remote work (Time 2) moderates the relationship between extraversion (Time 1) and work engagement (Time 2).

# MODERATION



# Final remarks

- The results indicated that the Big Five was consistently related to work behaviour and occupational health outcomes.
  - Extraversion had the strongest positive association with work engagement (0.25), innovative work behaviour (0.26) and general health (0.17)
  - Neuroticism had the strongest negative association with work engagement (-0.16), general health (-0.21), and sick leave (-0.23).
  - Conscientiousness increases work engagement (0.11) and general health (0.11)
  - Agreeableness increases the risk of sick leave (0.11)
  - Intellect/imagination increases innovative work behaviour (0.13).
- Remote work reduces the influence extraversion has on work engagement
- Remote work five days a week also reduces the effect conscientiousness has on general health.
- Remote work did not moderate trait–performance linkages associated with intellect/imagination, agreeableness or neuroticism.
- This study provides updated knowledge on trait– performance linkages post-COVID-19 and demonstrates that **remote work can reduce the positive influence of extraversion and conscientiousness.**



#### OPEN ACCESS

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# The pros and cons of remote work in relation to bullying, loneliness and work engagement: A representative study among Norwegian workers during COVID-19

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Remote work became the new normal during COVID-19 as a response to restrictions imposed by governments across the globe. Therefore, remote work's impact on employee outcomes, well-being, and psychological health has become a serious concern. However, the knowledge about the mechanisms and outcomes of remote work is still limited. In this study, we expect remote work to be negatively related to bullying and assume that bullying will mediate remote work's impact on work engagement and loneliness. To test our hypothetical model, we applied a cross-sectional design using data from a large representative sample of 1,511 Norwegian workers. The data were collected in September 2021 during a period of COVID-19 restrictions in Norway. The results confirmed our hypotheses: remote work was positively related to loneliness and work engagement but negatively related to bullying. Further, bullying was positively related to loneliness and negatively related to work engagement. Moreover, bullying was also found to play a partial mediating role, supporting our hypothesis. This study suggests that remote work is related to both positive and negative mechanisms in the workplace. Remote work can potentially reduce bullying and have a protective function in preventing bullying. However, since remote work has positive relations with both loneliness and work engagement, this study illustrates that organizations should be cautious and perhaps consider a moderate level of remote work. Hence, the results have several implications for HR policies and management.

## Abstract

Data is from T1(wave 1)

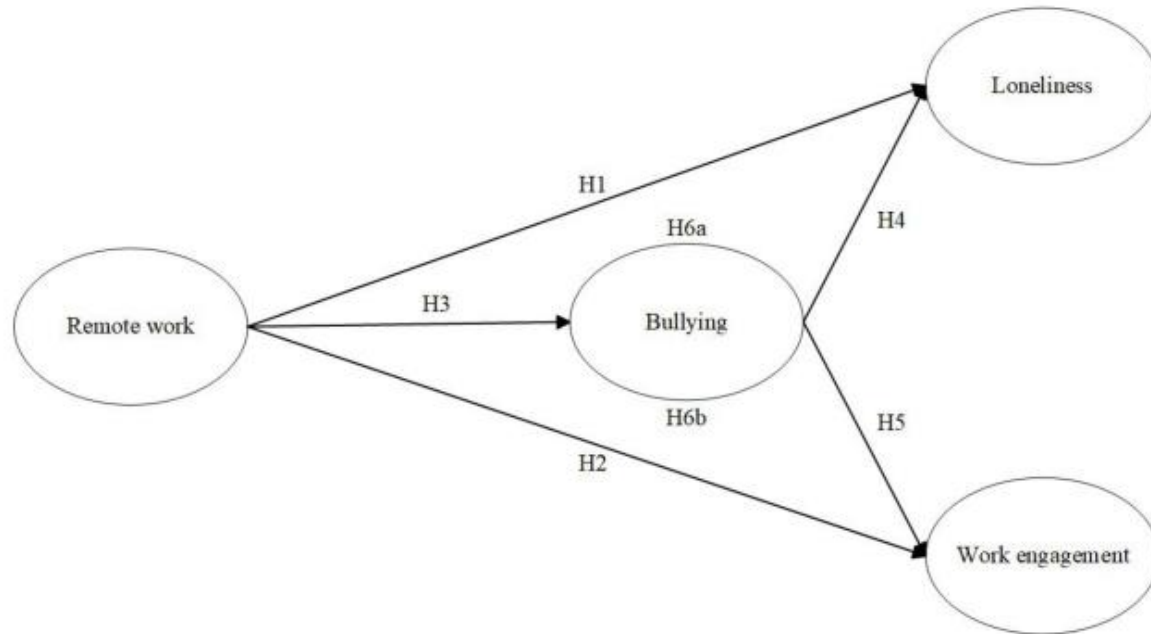


FIGURE 1  
The research model, with letters referring to the presented hypotheses.

## Hypotheses and research model

H1: Remote work is positively associated with loneliness.

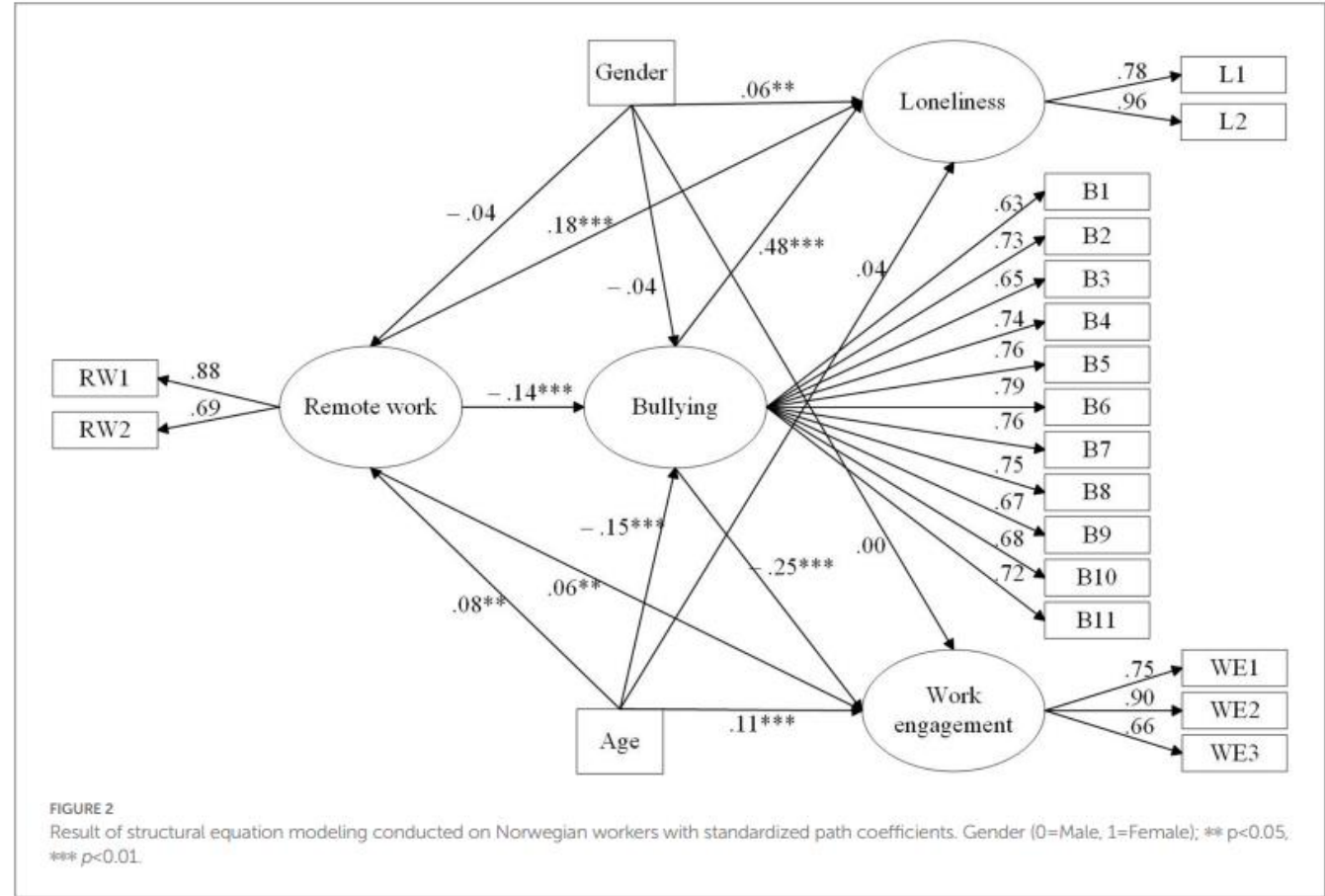
H2: Remote work is positively associated with work engagement.

H3: Remote work is negatively related to bullying

H4: Bullying is positively related to loneliness.

H5: Bullying is negatively related to work engagement.

H6: Bullying will mediate remote work's associations with (a) loneliness and (b) work engagement.



# Results (SEM)

Hypotheses	Relationships	$\beta$	P
H1	Remote work → Loneliness	0.18	0.001
H2	Remote work → Work engagement	0.06	0.048
H3	Remote work → Bullying	-0.14	0.001
H4	Bullying → Loneliness	0.48	0.001
H5	Bullying → Work engagement	-0.25	0.001

TABLE 5 Specific indirect effects.

Hypotheses	Relationships	$\beta$	P
H6a	Remote work → Bullying → Loneliness	-0.07	0.001
H6b	Remote work → Bullying → Work engagement	0.04	0.001



# Final remarks

- The results confirmed our hypotheses
- Remote work was positively related to loneliness and work engagement but negatively related to bullying.
- Bullying was positively related to loneliness and negatively related to work engagement.
- Moreover, bullying was also found to play a partial mediating role, supporting our hypothesis.
- This study suggests that **remote work is related to both positive and negative mechanisms** in the workplace.
  - Remote work can potentially reduce bullying and have a protective function in preventing bullying.
  - However, since remote work has positive relations with both loneliness and work engagement, this study illustrates that organizations should be cautious and perhaps consider a moderate level of remote work.

# You might also be interested in this study

Article

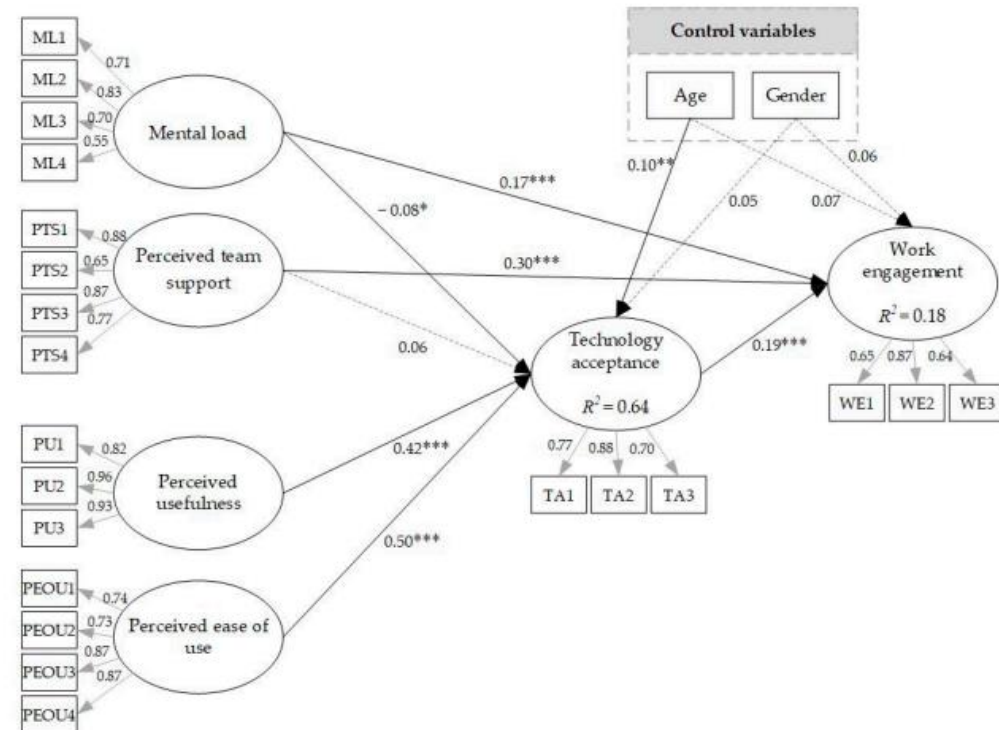
## Employees' Work-Related Well-Being during COVID-19 Pandemic: An Integrated Perspective of Technology Acceptance Model and JD-R Theory

Marjan Shamsi <sup>1,\*</sup>, Tatiana Iakovleva <sup>1</sup>, Espen Olsen <sup>1</sup> and Richard P. Bagozzi <sup>2</sup>

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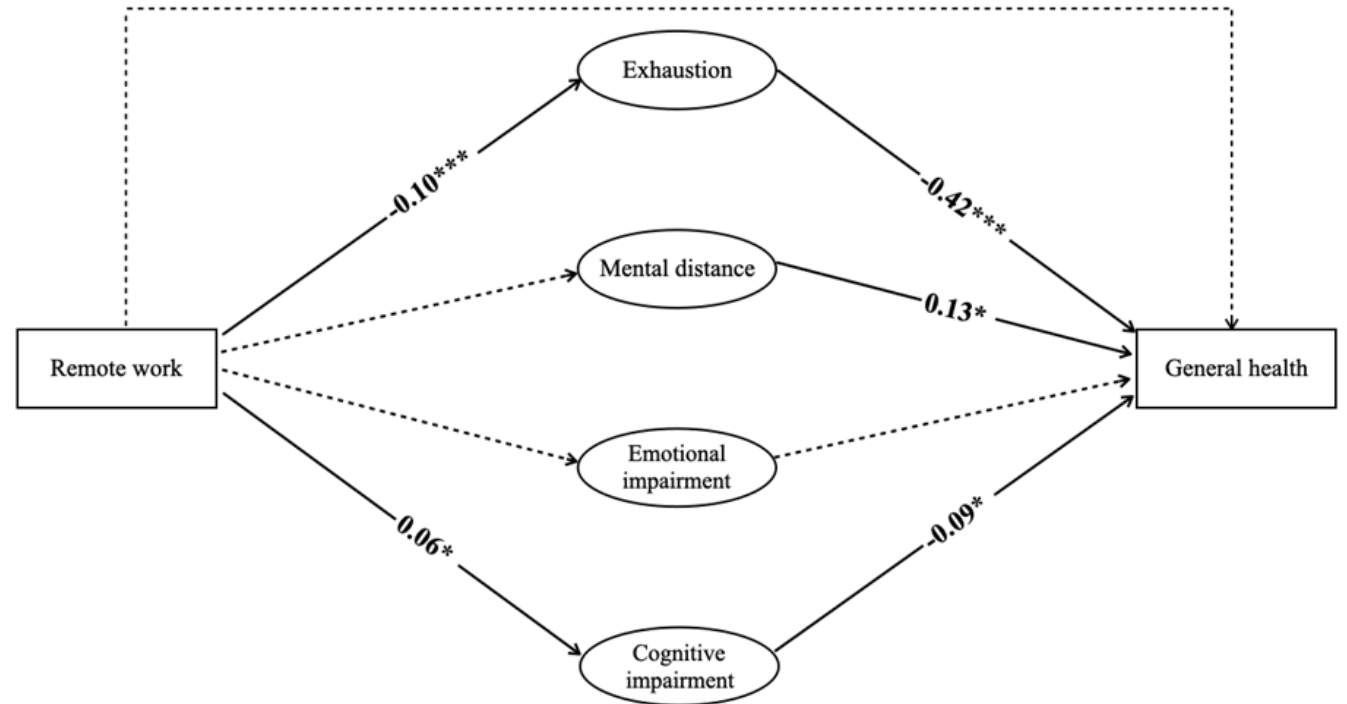
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**Figure 2.** The final model. Note: Discontinuous lines mean nonsignificant relationships. \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ .

Work in progress:

# Remote work, burnout and general health



Path	$B$	$\beta$	p	95% C.I.	
				Lower	Upper
<i>Indirect relationships</i>					
Remote work → Exhaustion → General health	0.03	0.04	.01	0.01	0.05
Remote work → Mental distance → General health	-.01	-.01	.47	-.01	0.01
Remote work → Emotional impairment → General health	<.01	<.01	.93	-.01	0.01
Remote work → Cognitive impairment → General health	-.01	-.01	.18	-.01	0.01

Indicate remote work can be a way to reduce exhaustion and indirectly improve general health



**Thank you!**  
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