

AI and Stress

Thang Dang Phuong Huynh

University of Turku
University of Economics Ho Chi Minh City

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Introduction

Motivation

- ▶ AI has been rapidly adopted at work worldwide since its recent emergence
 - ▶ $\approx 27\%$ of employed Americans report using generative AI weekly for work (Bick et al. 2026)
 - ▶ $\approx 90\%$ of U.S. employers anticipate integrating AI technologies by 2028 (Amazon Web Services 2024)
- ▶ Substantial research on AI's economic consequences
 - ▶ Employment, wages, innovation, productivity
- ▶ **Yet** AI's implications for worker health and well-being remain comparatively understudied (Giuntella et al. 2025)
- ▶ Stress has been increasingly recognized as a key driver of workplace health problems (Piao and Managi 2022; Henstock et al. 2025)
- ▶ How AI adoption relates to worker mental health is *theoretically ambiguous*
 - ▶ Potential benefits: automating repetitive tasks, streamlining workflows (Loureiro et al. 2023)
 - ▶ Potential harms: job insecurity, intensified work demands, algorithmic surveillance (Jetha et al. 2023)

Introduction

This research

- ▶ Investigate whether AI adoption is associated with worker stress in Finnish workplaces
- ▶ **Data:** 2023 and 2024 Finnish Working Life Barometers
 - ▶ Pooled analytical sample of 3,602 workers
 - ▶ 552 treated workers (15.3%) using AI daily or weekly
- ▶ **Method:** Propensity Score Matching (PSM)
 - ▶ Accounts for observable differences between AI adopters and non-adopters
 - ▶ Probit regression with 26 covariates; Kernel matching to estimate ATT
 - ▶ Comprehensive validation: alternative algorithms, covariate specs, falsification tests
- ▶ **Three research questions:**
 1. Is AI adoption associated with higher worker stress?
 2. Is the association heterogeneous across workforce subgroups?
 3. Which work-related factors are associated with the AI-stress link?

Relevant literature

AI adoption and worker mental health

- ▶ **South Korea:** [Kim and Lee 2024](#) find AI adoption significantly increases job stress, mediating employee burnout
 - ▶ [Kim and Lee 2025](#) show organizational AI adoption positively relates to employee depression, mediated by job insecurity
 - ▶ Dominant pathway: *displacement fears and job insecurity*
- ▶ **Germany:** [Koch and Lodefalk 2025](#) find no adverse relationship between AI adoption and worker stress
 - ▶ [Giuntella et al. 2025](#) find no negative consequences for mental health; slight improvements in health attributed to reduced physical job intensity
- ▶ **Our paper** provides Finnish evidence and identifies *labor intensification* as the more salient associated factor

Data

Finnish Working Life Barometers (2023–2024)

- ▶ Annual surveys by the Finnish Ministry of Economic Affairs and Employment and Statistics Finland (initiated 1992)
- ▶ Rich information on economic conditions, workplace organization, employee autonomy, and psychosocial work environment
- ▶ Pooled analytical sample: **3,602 workers** (2023 and 2024 waves)
- ▶ **AI adoption:** Dummy = 1 if using AI *daily* or *weekly*
 - ▶ “How often do you use AI-based tools to do your work?”
 - ▶ 552 treated workers (15.3%)
- ▶ **Stress:** Dummy = 1 if reporting stress *quite a lot* or *very much*
 - ▶ “Are you currently experiencing this type of stress?”
 - ▶ 17.2% of full sample; 21.9% among AI users vs. 16.4% among non-users
 - ▶ Raw difference: 5.5 ppts (p -value=0.002)
- ▶ **Associated factors:** Unpaid work, intense work absorption, job insecurity

Methodology

Propensity Score Matching (PSM)

- ▶ Selection problem: AI adopters may systematically differ from non-adopters
- ▶ **Average Treatment Effect on the Treated (ATT):**

$$E(Y_1 - Y_0 \mid X, T = 1) \quad (1)$$

- ▶ Identified under the *conditional independence assumption*:
 $(Y_0, Y_1) \perp T \mid X$
- ▶ **Propensity score (Rosenbaum and Rubin 1983):**

$$P(X) = P(T = 1 \mid X) \quad (2)$$

estimated via Probit regression with **26 covariates**:

- ▶ Individual and job characteristics, union membership
- ▶ Economic sector, occupation, workplace size, survey year
- ▶ **Kernel matching** reduces variance by utilizing more information from the control group
- ▶ Comprehensive validation: alternative algorithms, covariate specs, simulated confounders, falsification tests

Descriptive statistics

Summary statistics for stress and associated factors

	All		Treated		Control		Treat – Control	
	Mean	SD	Mean	SD	Mean	SD	Diff.	<i>p</i> -val
<i>(a) Outcome of interest</i>								
Stress	0.172	0.378	0.219	0.414	0.164	0.370	0.055	0.002
<i>(b) Associated factors</i>								
Unpaid work	0.107	0.309	0.172	0.378	0.095	0.293	0.077	0.000
Intense work absorption	0.515	0.500	0.565	0.496	0.506	0.500	0.059	0.010
Job insecurity	0.075	0.263	0.101	0.302	0.070	0.255	0.031	0.009

Note: $N = 3,602$ (treated: 552, control: 3,050). *p*-values from *t*-tests. Bold = significant at 5% level.

Matching results

Covariate balance before and after matching

	Treated (1)	Control (2)	Diff. (3)	p-val (4)	Matched (5)	p-val (6)
<i>Individual characteristics</i>						
Female worker	0.478	0.528	-0.050	0.032	0.484	0.817
Age (years)	41.84	44.22	-2.378	0.000	42.01	0.647
Permanent contract	0.891	0.912	-0.021	0.111	0.893	0.893
Part-time job	0.067	0.107	-0.040	0.004	0.069	0.841
Job tenure (years)	7.649	9.819	-2.170	0.000	7.820	0.609
Public employer	0.279	0.340	-0.061	0.005	0.285	0.763
Agency worker	0.016	0.010	+0.006	0.177	0.016	0.472
Union member	0.621	0.685	-0.063	0.004	0.621	0.932
<i>Occupation (selected)</i>						
Managerial position	0.089	0.034	+0.055	0.000	0.081	0.366
Professional/specialist	0.576	0.316	+0.260	0.000	0.573	0.949
Technicians	0.185	0.252	-0.067	0.001	0.180	0.673
Service & sales	0.058	0.156	-0.098	0.000	0.063	0.578
<i>Workplace size</i>						
Small (1-9 emp.)	0.123	0.186	-0.062	0.000	0.126	0.839
Medium (10-49 emp.)	0.259	0.395	-0.136	0.000	0.252	0.566
Large (50-249 emp.)	0.317	0.250	+0.067	0.001	0.318	0.980
Very large (250+ emp.)	0.301	0.169	+0.132	0.000	0.305	0.671

Note: Kernel matching. Matched control column shows post-matching covariate means. All post-matching p-values are statistically insignificant — balance achieved.

Results

AI and stress: ATT estimates

	ATT	SE	p-value
<i>(a) Baseline</i>			
Baseline	0.044	0.020	0.029
<i>(b) Alternative matching algorithms</i>			
Local linear	0.044	0.026	0.093
Caliper no replacement	0.049	0.024	0.039
Caliper with replacement	0.053	0.026	0.040
Nearest neighbour	0.053	0.026	0.040
<i>(c) Alternative sets of covariates for matching</i>			
Excl. job characteristics	0.045	0.020	0.025
Excl. union membership	0.043	0.020	0.033
Excl. sectors	0.045	0.020	0.024
Excl. occupations	0.051	0.020	0.009
Excl. workplace sizes	0.042	0.020	0.035
<i>(d) Alternative AI measure</i>			
Relaxed AI measure (incl. monthly)	0.052	0.019	0.005

Note: Kernel matching. $N = 3,602$. Bold = significant at 5% level.

Results

AI and stress: Heterogeneity analysis

	N	Mean	ATT	p-value
<i>(a) Gender</i>				
Men	1,728	0.130	0.077	0.005
Women	1,874	0.211	0.012	0.676
<i>(b) Supervisor status</i>				
Non-supervisor	2,830	0.169	0.053	0.022
Supervisor	772	0.184	0.042	0.305
<i>(c) Union membership</i>				
Union member	2,431	0.186	0.050	0.062
Non-union member	1,171	0.143	0.036	0.244
<i>(d) Workplace size</i>				
Small (1-9 emp.)	634	0.161	0.065	0.229
Medium (10-49 emp.)	1,348	0.180	0.092	0.027
Large (50-249 emp.)	938	0.160	0.023	0.501
Very large (250+ emp.)	682	0.185	0.035	0.368

Note: Kernel matching. Bold = significant at 10% level. Mean = baseline stress rate.

Results

AI and associated factors: Full sample & by gender

	N	ATT	SE	p-value
<i>(a) Full sample</i>				
Unpaid work	3,602	0.063	0.018	0.000
Intense work absorption	3,602	0.043	0.025	0.081
Job insecurity	3,602	0.015	0.015	0.326
<i>(b) Men</i>				
Unpaid work	1,728	0.067	0.027	0.013
Intense work absorption	1,728	0.060	0.035	0.089
Job insecurity	1,728	0.014	0.021	0.524
<i>(c) Women</i>				
Unpaid work	1,874	0.048	0.025	0.052
Intense work absorption	1,874	0.010	0.035	0.778
Job insecurity	1,874	0.024	0.020	0.236

Note: Kernel matching. Bold = significant at 10% level.

Results

AI and associated factors: By supervisor status & workplace size

	N	ATT	SE	p-value
<i>(d) Non-supervisor</i>				
Unpaid work	2,830	0.044	0.018	0.015
Intense work absorption	2,830	0.035	0.029	0.218
Job insecurity	2,830	0.014	0.018	0.421
<i>(e) Supervisor</i>				
Unpaid work	772	0.129	0.044	0.004
Intense work absorption	772	0.069	0.049	0.157
Job insecurity	772	0.024	0.027	0.362
<i>(f) Small workplace (1-9 emp.)</i>				
Unpaid work	634	0.134	0.054	0.014
Intense work absorption	634	0.057	0.070	0.419
Job insecurity	634	-0.048	0.034	0.157
<i>(g) Medium workplace (10-49 emp.)</i>				
Unpaid work	1,348	0.124	0.038	0.001
Intense work absorption	1,348	0.047	0.049	0.334
Job insecurity	1,348	0.093	0.033	0.005
<i>(h) Large workplace (50-249 emp.)</i>				
Unpaid work	938	0.022	0.031	0.475
Intense work absorption	938	0.062	0.044	0.161
Job insecurity	938	0.012	0.027	0.670
<i>(i) Very large workplace (250+ emp.)</i>				
Unpaid work	682	0.041	0.031	0.186
Intense work absorption	682	0.028	0.047	0.552
Job insecurity	682	-0.024	0.025	0.340

Note: Kernel matching. Bold = significant at 10% level.

Conclusion

- ▶ AI adoption is associated with a **4.4 percentage point (25.6%) increase** in reported stress among Finnish workers
- ▶ The association is concentrated among **men, non-supervisors, union members, and workers in medium-sized workplaces**
- ▶ The association is more closely linked to **labor intensification** than displacement anxiety
 - ▶ Significant increases in unpaid work and intense work absorption
 - ▶ No association with job insecurity (in contrast to South Korean findings)
- ▶ **Cross-national contrast:**
 - ▶ South Korea: displacement fears dominate ([Kim and Lee 2024](#); [Kim and Lee 2025](#))
 - ▶ Germany: neutral or slightly positive effects ([Giuntella et al. 2025](#))
 - ▶ Finland: labor intensification dominates, reflecting strong welfare state and employment protections
- ▶ **Policy implications:** Monitoring and addressing intensified labor demands—not just displacement—is critical for protecting worker well-being in the AI era

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Thang Dang

thang.dang@utu.fi

Phuong Huynh

phuong.m.huynh@utu.fi