Job Demands, Time Use, and Cognitive, Mental, and Physical Health over the Life Course

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CIPHER Workshop
February 25, 2026

What are the Long-Term Effects of Work on Health?

- Work has both protective and harmful effects for long-term health
  - Benefits: income, social connection, purpose, etc.
  - Risks: high mental, physical, and emotional demands → stress, burnout, health declines
- The JD-R model shows how job demands interact with resources to shape health.
- Identifying causal effects of job demands is challenging:
  - Workers self-select into occupations based on unobserved preferences, abilities, constraints
  - Non-work behaviors can reinforce or offset job demands
- Critical gaps:
  1. No nationally representative data measuring mental, physical, and social demands—plus stress, burnout, and affect—both on and off work
  2. No evidence on the cumulative joint effects of work and non-work demands over time
  3. Identification of causal effects of job demands on health

Our Study

- Goals:
  - Measure work and non-work demands in daily life
  - Understand these demands interact with each other and influence health over time
- What is New:
  - Real-time measurement of mental, physical, and social demands; stress and affect
  - Nationally representative UAS panel (N = 15,000) linking demands to health
  - Continuous wearable tracking (N=10,000)
  - Address sorting into jobs with quasi-experimental methods
- Today's focus:
  - Feasibility: three pilot studies
  - Evidence from our largest pilot study (N = 1,000)

Pilot 1: Limits of Time Diaries for Work Demands (N=100)

- Design:
  - 24-hour diary in 15-minute slots
  - For each work/non-work activity:
    - → How mentally and physically demanding, stressful the activity was (5-point scale)
    - → How happy, bored, frustrated, and tired respondents felt during the activity
  - Non-work selected from structured drop-down
  - Work often entered as free-text ("work")

- Limitation:
  - Little granularity in work activities (e.g., work coded as 4–8 hour blocks)
  - Cannot measure within-day variation in work demands

→ Motivated shift to real-time EMA

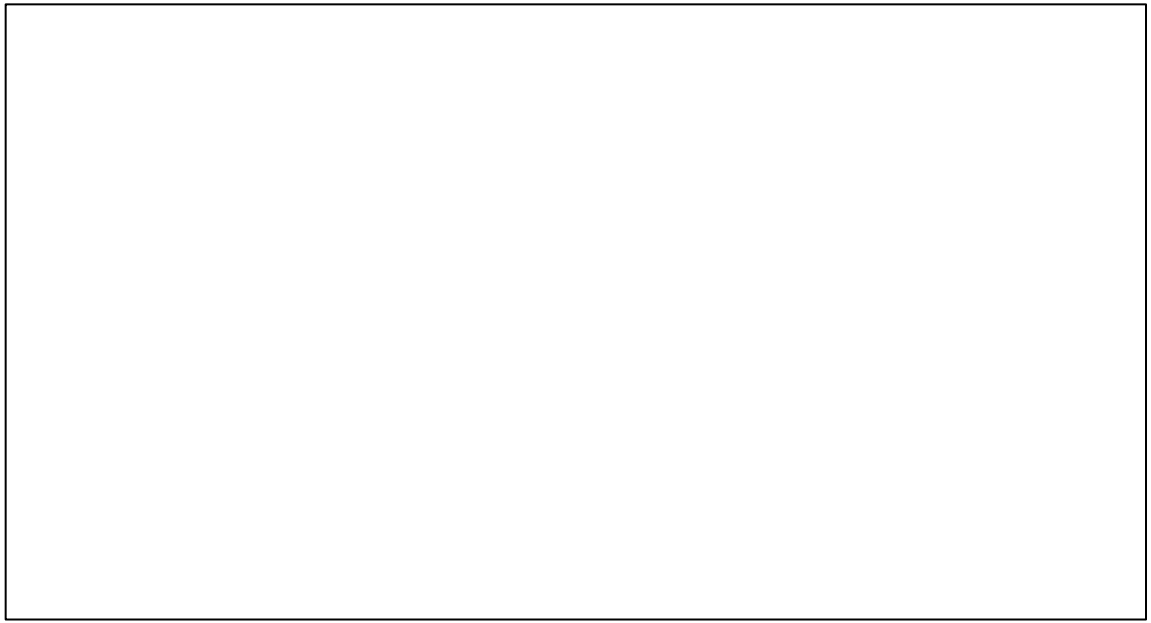
Pilot 2: Feasibility of Real-Time EMA (N=176)

- Design
  - 3 survey days (2 weekdays; 1 weekend day)
  - 4 EMA prompts per day (randomly spaced)
  - Prompt asked about demands and feelings over the past hour (coverage)
- Each prompt captured:
  - Work-related or not
  - Location and social context
  - Mental, Physical, Social demands, Stress, Affect (5-point scale; as in Pilot 1)
- EOD time diary same as Pilot 1, but "work" summarized as a single activity
- Key Results:
  - 71% EMA response rate
  - 84% overlap between EMA work prompts and time diaries
  - Work associated with higher mental, social demands, higher stress and lower happiness

Pilot 3: Scaling and Identification Strategy (N=1,000)

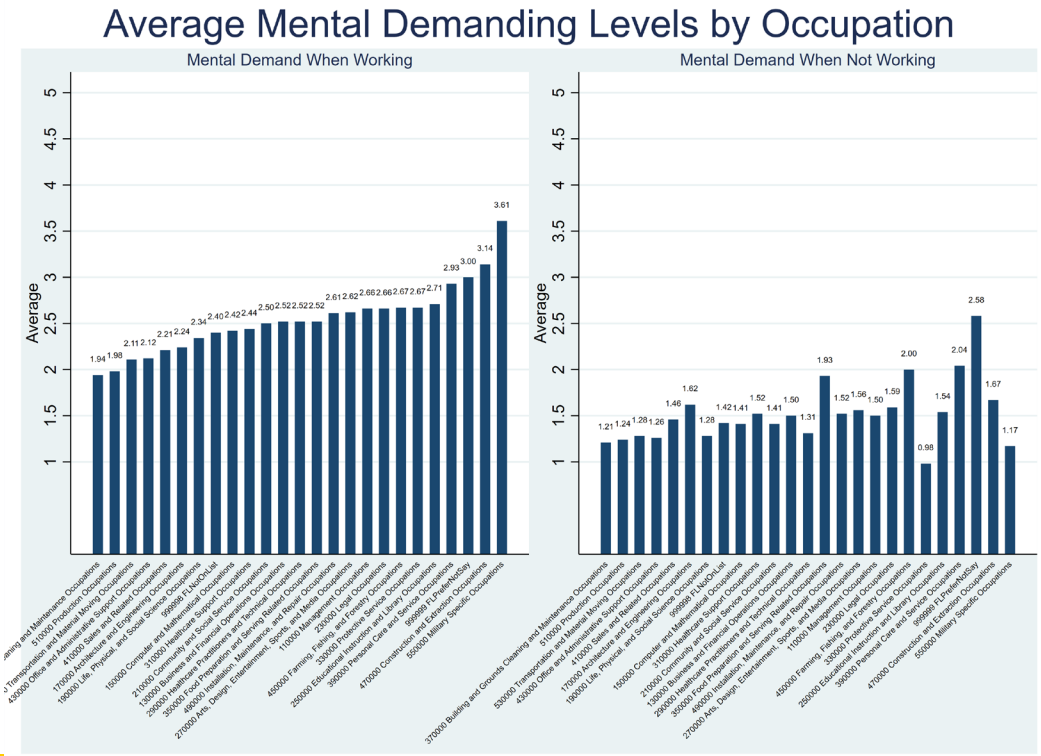
- Design Improvements
  - 5 EMA prompts per day
  - Coverage vs. momentary experimental comparison (trade-offs)
- Job choice experiment to understand sorting:
  - Choose between two jobs differing in one demand (mental, physical, or social)
  - Then increase the wage of less-preferred job
  - Switching behavior identifies willingness-to-pay (WTP)
  - Conditioning on WTP can help identify causal effects
- Feasibility and Validation
  - EMA response rates and overlap with time diaries were similar to Pilot 2
  - No differences between coverage and momentary approaches

Pilot 3 Results: Work vs. Non-Work Demands and Affect



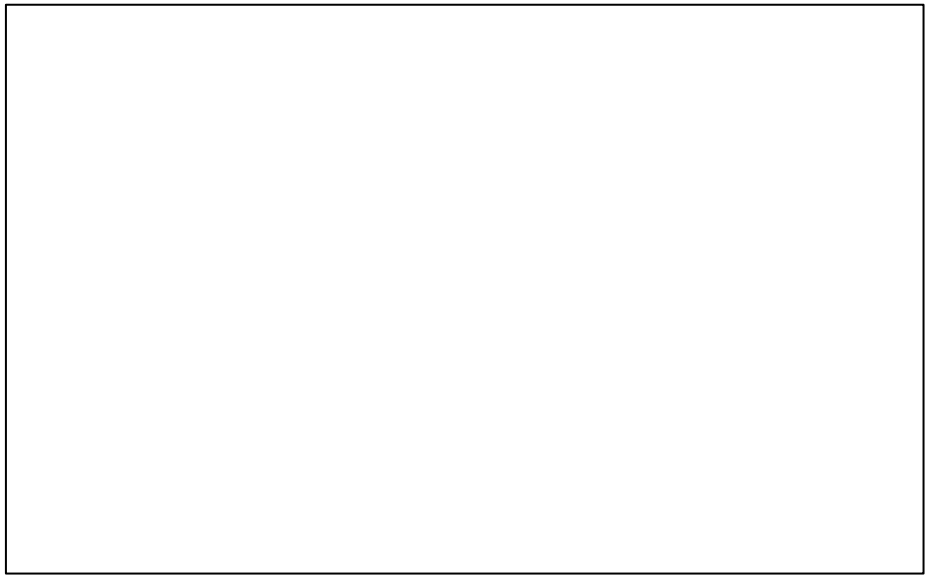
- Same as Pilot 2: Work→ higher mental and social demands; higher stress, boredom, and frustration; lower happiness; no difference in physical demands

Large Variation in Job Demands Across Occupations



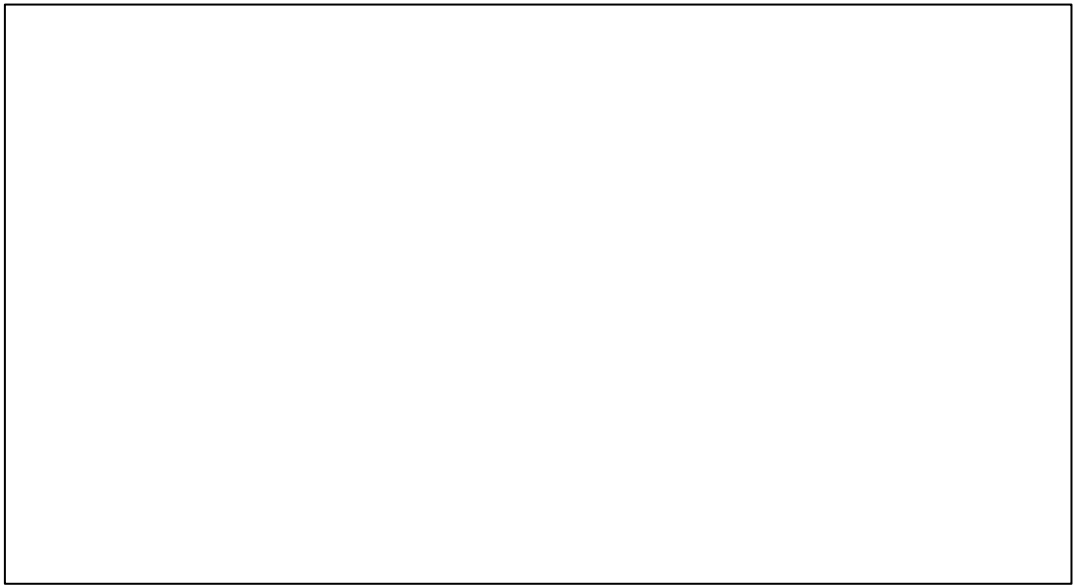
- Cognitive occupations: high mental, low physical demands
- Physically intensive jobs: reverse pattern (exception: construction work)
- No obvious compensatory or reinforcing behavior at home (which would increase in the presence of sorting).
- Stress patterns looks very similar

Strong Aversion to Physical Strain, Tolerance for Mental and Social Demands Varies



- 76% strongly or mildly prefer less physically demanding jobs
- WTP for mental and social demands is more evenly distributed

Do People Sort into Jobs Based on Preferences?

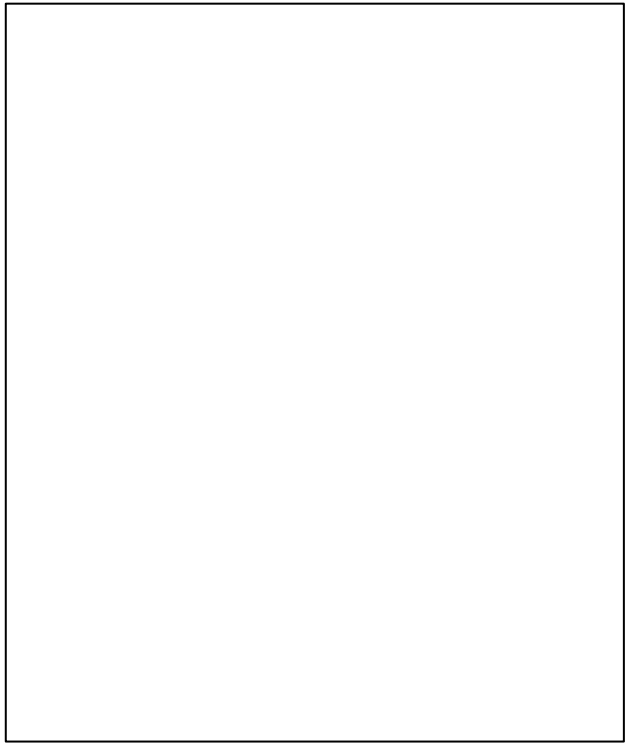


- We aggregate 4 preference types into 2: Prefer less vs Prefer More
- Clear sorting into physically demanding jobs: prefer more physical demands → more physically demanding jobs
- Limited evidence of sorting on mental and social demands

Next Steps

- Expand Data Collection (pending funding)
  - Two-wave longitudinal EMA (UAS, N = 15,000)
  - Link daily demands to long-term cognitive, mental, and physical health
  - Add job resource and retrospective work modules
- Strengthen Identification: Historical Labor-Market Variation
  - Use differences in local labor markets at labor-market entry
  - Combine historical occupational shares with O*NET task intensities
  - Generate cohort-by-state variation in exposure that is not driven by individual job choice
- Proof of Concept (Pilot 3):
  - Historical task composition predicts current job demands
- Goal: Credible estimation of life-course health effects of job demands

Theory of Change and Measurement

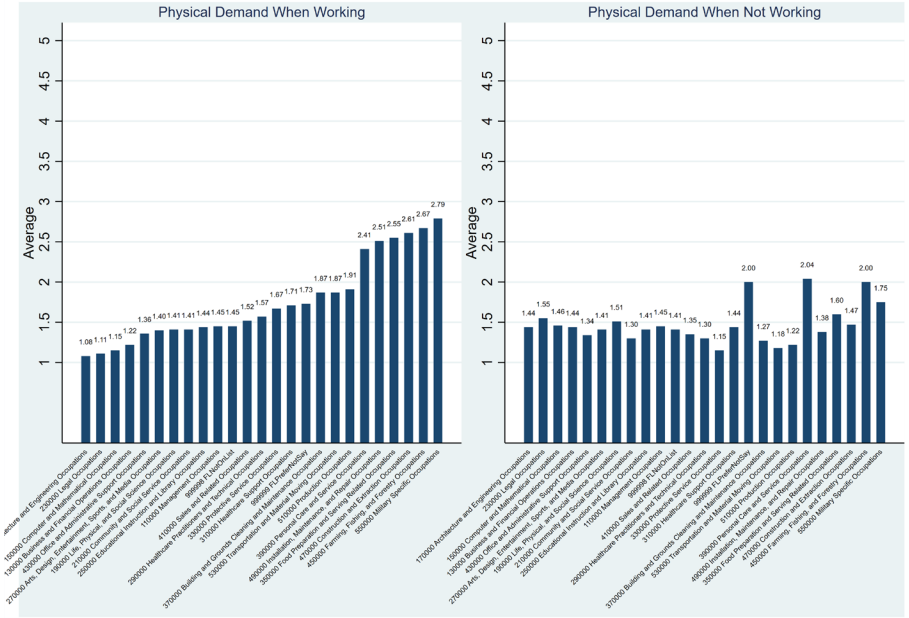


Key Measures

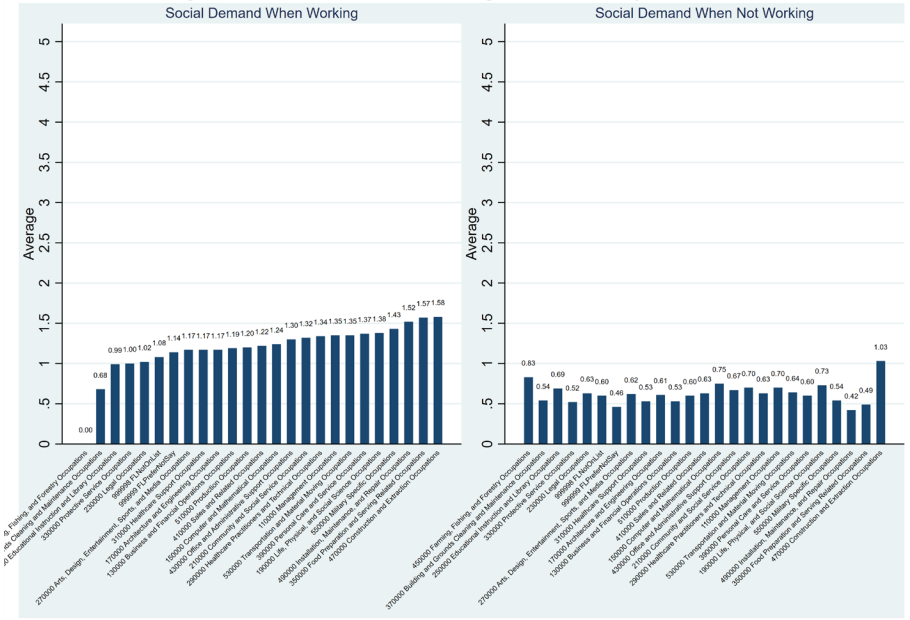
- **Demands (mental, physical, social)** → EMA + diaries 3 random days/5 prompts; UAS-ALiR (physical activity)
- **Job resources, satisfaction** → EOD surveys (Job Content Questionnaire)
- **Mediators** → EMA stress and affect; UAS-core risky behaviors; Stress Management Toolbox.
- **Health outcomes** → UAS-core (overall health, depression, anxiety, chronic conditions, cognitive tests); UAS-ALiR (physical health)
- **Occupational histories** → UAS-core occupational histories; new UAS module on rerospective work/non-work demands
- **Occupational Sort** → EOD survey on stated-preference choice experiments

Large Variation in Job Demands Across Occupations

Average Physical Demanding Levels by Occupation



Average Social Demanding Levels by Occupation



Instrumenting Job Demands with Historical Labor Market Structure

- Idea: Bartik-style IV
  - Combine O*NET task intensities with historical occupational shares
  - Exogenous cohort-by-state variation in task exposure at labor-market entry
- Proof of Concept (Pilot 3):
  - Historical physical and cognitive task composition predicts current job demands
  - Strongest first-stage for cognitive demands
  - Signs consistent with task content
- Two complementary identification strategies: WTP-based CFA + Bartik IV