

Artificial Intelligence and Employee Engagement the Role of Managers in the Digital Workplace

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Abstract—Artificial intelligence is reshaping how organizations coordinate work, allocate tasks, and supervise performance. Research on this shift has concentrated on productivity outcomes, leaving the behavioral consequences for employees and managers expected to absorb the disruption on their behalf underdeveloped. This paper advances a conceptual framework specifying how AI adoption reaches employee engagement through two opposing pathways. Integrating Self-Determination Theory with the Job Demands–Resources model, we argue that AI functions simultaneously as a job resource, supporting perceived competence and autonomy, and as a job demand, generating technostress through algorithmic control and surveillance. We propose that AI literacy and AI anxiety determine which pathway dominates. The framework’s distinctive contribution is a cross-level proposition: algorithmic coordination displaces core middle-management functions, producing role ambiguity that undermine managers’ capacity to supply the psychological safety their subordinates require. Managerial insecurity is therefore not peripheral to employee engagement but antecedent to it. We conclude with a PRISMA-based systematic review protocol through which the framework’s five propositions can be evaluated against the existing empirical record.

Index Terms—artificial intelligence; employee engagement; algorithmic management; technostress; middle management; job demands–resources

I. INTRODUCTION

Organizations adopt artificial intelligence expecting gains in speed, precision, and decision quality, and the early evidence indicates those gains are real (Brynjolfsson, Li, & Raymond, 2025; Noy & Zhang, 2023). What that evidence does not settle is what AI adoption does to the psychological conditions on which sustained engagement depends. Productivity and engagement are not interchangeable: a workforce can resolve more tickets per hour while becoming less willing to exercise effort.

Within the digital workplace, AI applications now span talent acquisition algorithms, personalized learning systems, automated operational workflows, and predictive performance dashboards. Each alters not only what work gets done but who, or what, decides how it is done. This is the automation–augmentation paradox (Raisch & Krakowski, 2021) in its organizational form. The same system that extends human capability can also constrain human discretion, and the balance between the two is a matter of design and governance rather than a property of the technology.

This paper makes three contributions. First, it specifies the dual pathway: resource and demand, through which AI adoption reaches employee engagement. Second, it identifies AI literacy and AI anxiety as the individual-level conditions determining which pathway dominates. Third, it argues that the middle managers among the principal casualties of widespread AI adoption, and that their insecurity propagates downward. We then set out a review protocol through which the framework can be evaluated before primary data collection is undertaken.

II. THEORETICAL FOUNDATIONS

2.1 The Psychological Conditions of Engagement

Engagement rests on three psychological conditions: meaningfulness, safety, and availability (Kahn, 1990). Employees who experience their work as significant, who feel able to express themselves without fear of adverse consequence, and who retain the cognitive and emotional resources to invest, display higher vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Self-Determination Theory locates the motivational substrate of these conditions in three innate needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). The two frameworks converge on saying that engagement is not a disposition employees bring to work but a state that organizational conditions produce or destroy. Safety is supplied interpersonally and depends heavily on the behavior of the immediate supervisor (Edmondson, 1999).

2.2 The Generative AI Paradigm

Generative AI differs from earlier predictive systems in that it participates in cognitive work rather than merely informing it. The empirical record is still narrow but internally consistent. In a field study of 5,172 customer-support agents, access to a generative AI assistant raised issues resolved per hour by 15% on average, with the largest gains accruing to less experienced and lower-skilled workers and only small gains in speed, alongside small declines in quality, among the most experienced (Brynjolfsson et al., 2025). In an experiment with 453 college-educated professionals performing mid-level writing tasks, access to a generative assistant raised average output quality and compressed the performance distribution, roughly halving the correlation between participants' pre- and post-treatment grades (Noy & Zhang, 2023).

Two cautions follow. First, both studies measure output, not psychological states: neither assessed perceived competence, need satisfaction, or engagement. The inferential step from productivity gain to motivational benefit is therefore not established by this evidence. Second, both studies

examine a particular kind of work: discrete tasks, completed by one person, against an agreed performance measure. Whether AI produces comparable gains in work that is collaborative, open-ended, or lacking a clean output metric is an open question.

III. ALGORITHMIC MANAGEMENT AND THE MIDDLE MANAGEMENT PARADOX

Models of human–AI symbiosis assume a stable managerial layer that interprets technology for the workforce and absorbs its shocks (Jarrahi, 2018). That assumption is increasingly difficult to sustain. Algorithmic coordination systems now perform functions that historically defined the middle-management role: routing information, prioritizing tasks, allocating work, and brokering cross-functional collaboration. What Rouvroy and Berns (2013) term algorithmic governmentality names the consequence: authority migrates from identifiable human supervisors to decision procedures that are distributed, continuously updated, and largely opaque to those subject to them. For middle managers the effect is not merely a narrower remit. Where an occupational role supplies the continuity of self-narrative that Giddens (1991) calls ontological security, automating its core competencies destabilizes professional identity and generates role ambiguity. The organizational change literature has long observed that middle managers are change recipients as well as change implementers, performing interpretive and emotional labor on behalf of others while managing their own uncertainty (Balogun, 2003; Huy, 2002). Algorithmic management intensifies this double position: managers are asked to legitimize the systems that are displacing them.

This matters for employee engagement because psychological safety is supplied locally. A manager uncertain of their own standing is poorly placed to extend to subordinates the interpersonal security that Kahn's safety condition requires (Edmondson, 1999). The managerial layer cannot buffer a disruption it is itself absorbing. We therefore model managerial insecurity not as background context but as an antecedent of employee engagement.

IV. CONCEPTUAL FRAMEWORK AND PROPOSITIONS

4.1 AI as Job Resource and Job Demand

The Job Demands–Resources model holds that working conditions sort into demands, which deplete energy through a health-impairment pathway, and resources, which sustain motivation through a motivational pathway (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Bakker & Demerouti, 2017). AI is unusual in that one technology populates both categories at once, and which category dominates is determined by implementation rather than by capability. Deployed as augmentation, AI supplies informational and developmental resources: it compresses the experience curve, surfaces expert practice to novices, and widens the range of problems an individual can address (Brynjolfsson et al., 2025). Deployed as control, the same analytic capacity demands: continuous measurement, algorithmic task assignment, and automated evaluation.

Proposition 1. Where AI adoption raises task performance for lower-skilled and less experienced employees, it increases perceived competence and autonomy and thereby work engagement (motivational pathway).

4.2 Technostress and Algorithmic Control

AI's architectural capacity to extend autonomy is matched by its capacity to intensify surveillance and enforce algorithmic control (Kellogg, Valentine, & Christin, 2020). The mechanism linking control to disengagement is technostress, which is the strain arising from techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). Evidence from algorithmically managed settings supports the link. In a survey of 621 drivers on a ride-hailing platform, both gatekeeping and guiding forms of algorithmic control were positively associated with threat technostressors, and algorithmic transparency did not reliably buffer them (Cram, Wiener, Tarafdar, & Benlian, 2022). Platform work research reports the same tension between the autonomy algorithmic coordination nominally affords and the control it exercises in practice (Wood, Graham, Lehdonvirta, & Hjorth, 2019). A meta-analysis of 70 independent samples finds electronic monitoring associated with modestly elevated stress and reduced job satisfaction, with no offsetting performance gain (Siegel, König, & Lazar, 2022).

Proposition 2. Technostress mediates a negative relationship between algorithmic management and employee engagement (health-impairment pathway).

4.3 AI Literacy and AI Anxiety as Conditioning Variables

Whether an employee experiences a given deployment as resource or as demand depends on appraisal, and appraisal varies across individuals. Trust in AI is itself multidimensional, shaped by system transparency, reliability, and anthropomorphism (Glikson & Woolley, 2020). Two constructs are central here. AI anxiety is the apprehension spanning job-replacement concern, learning anxiety, and sociotechnical blindness (Li & Huang, 2020). AI literacy is the competencies required to evaluate AI systems, interact effectively, and communicate about them (Long & Magerko, 2020).

Proposition 3. AI anxiety negatively moderates the relationship between AI adoption and employee engagement, as the motivational pathway weakens with an increase in anxiety.

Proposition 4. AI literacy conditions the relationship between AI adoption and engagement indirectly, by reducing AI anxiety. The implied form is moderate mediation rather than simple interaction and should be tested as such.

4.4 The Cross-Level Managerial Pathway

The propositions above remain within the employee level and taken alone, reproduce the assumption criticized in Section 3. The framework's distinguishing claim is that the managerial layer is an endogenous part of the system rather than a stable boundary condition.

Proposition 5. Algorithmic displacement of managerial functions increases managerial role ambiguity, which reduces managers' capacity to provide psychological safety and, in turn, reduces subordinate engagement. The relationship is cross-level: an organization that addresses employee technostress without addressing managerial insecurity is bound to observe attenuated engagement gains.

V. A SYSTEMATIC REVIEW PROTOCOL FOR EVALUATING THE FRAMEWORK

A conceptual framework is most useful when it can be confronted with evidence before new data is collected. We therefore specify a review protocol, reported in accordance with PRISMA 2020 (Page et al., 2021) and registered in advance on PROSPERO to guard against the selective inclusion that otherwise allows a framework to recruit its own confirming evidence. Each proposition yields a corresponding review question: whether AI adoption is associated with perceived competence and autonomy (RQ1); whether technostress mediates an association between algorithmic control and engagement (RQ2); whether AI anxiety and AI literacy condition these associations (RQ3, RQ4); and what evidence exists on managerial role disruption as an antecedent of subordinate engagement (RQ5).

Searches would cover Scopus, Web of Science, Business Source Complete, and PsycINFO from 2015 to the present, using the string (“artificial intelligence” OR “generative AI” OR “algorithmic management” OR “algorithmic control”) AND (“employee engagement” OR “work engagement” OR technostress OR “psychological safety” OR “job demands”), supplemented by backward and forward citation chasing. Eligible studies would be peer-reviewed, report primary quantitative or mixed-methods data from organizational or platform-work samples and measure an association between an AI-related exposure and an engagement-related outcome. Conceptual papers without data, student-only laboratory samples, and human-factors studies of pre-AI automation would be excluded.

Title–abstract and full-text screening would be conducted independently in duplicate, with inter-rater agreement reported and disagreements resolved by a third reviewer. Extraction would capture sample, sector, AI type, operationalization of exposure and outcome, effect size, and moderators tested. Study quality would be appraised with a design-appropriate risk-of-bias instrument, and the review itself assessed against ROBIS. Synthesis would be narrative where heterogeneity precludes pooling, with random-effects meta-analysis where enough comparable effect sizes is available. We anticipate that RQ5 will return very little; if so, that absence is itself a reportable finding and the clearest justification for the primary research the framework invites.

VI. MANAGERIAL IMPLICATIONS AND ETHICAL GOVERNANCE

Three implications follow. First, participation: when management excludes the workforce from integration design, it risks deploying technically functional systems that misalign with on-the-ground operational requirements. Second, measurement restraint: digital telemetry is a poor proxy

for employee sentiment, and inferring engagement from activity data both misleads and intensifies the surveillance that depresses the construct being measured. Third, sequencing: if Proposition 5 holds, investment in managerial role redefinition should precede rather than follow employee-facing rollout.

VII. LIMITATIONS AND BOUNDARY CONDITIONS

The framework is untested; its five statements are propositions rather than hypotheses, and the review protocol in Section 5 is the first step toward evaluating them. The evidence base is also unbalanced in two respects. The strongest causal evidence on AI and performance comes from customer support and professional writing, which are bounded, measurable, individually performed tasks. An extension to interdependent, ambiguous, or creative work is speculative. Conversely, much of the technostress evidence derives from platform and gig contexts in which algorithmic control is unusually complete; effects in standard employment relationships are plausibly smaller.

Two further boundaries deserve statement. The framework is developed against an implicitly Western, high-autonomy baseline; the legitimacy of workplace monitoring and the value placed on autonomy vary substantially across institutional and cultural settings, and the strength of the technostress pathway should be expected to vary with them. Finally, both AI literacy and AI anxiety are moving targets as exposure to these systems becomes routine, so cross-sectional tests risk confounding adaptation with effect. Longitudinal, multi-wave designs with managers and subordinates matched across levels are the appropriate test of Proposition 5.

VIII. CONCLUSION

AI adoption does not act on employee engagement in a single direction. It supplies resources and imposes demands simultaneously, and the organizational choices governing implementation determine which predominates. The framework developed here makes that duality explicit, identifies the individual-level conditions that tip the balance, and — departing from existing human–AI models — treats the managerial layer as part of what the technology disrupts rather than as the mechanism that absorbs the disruption. Organizations that attend only to the employee level will likely find that the buffer they were counting on is no longer there.

REFERENCES

- [1]. Bakker, A. B., & Demerouti, E. 2017. Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3): 273–285.
- [2]. Balogun, J. 2003. From blaming the middle to harnessing its potential: Creating change intermediaries. *British Journal of Management*, 14(1): 69–83.

- [3]. Brynjolfsson, E., Li, D., & Raymond, L. R. 2025. Generative AI at work. *The Quarterly Journal of Economics*, 140(2): 889–942.
- [4]. Cram, W. A., Wiener, M., Tarafdar, M., & Benlian, A. 2022. Examining the impact of algorithmic control on Uber drivers' technostress. *Journal of Management Information Systems*, 39(2): 426–453.
- [5]. Deci, E. L., & Ryan, R. M. 2000. The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4): 227–268.
- [6]. Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. 2001. The job demands-resources model of burnout. *Journal of Applied Psychology*, 86(3): 499–512.
- [7]. Edmondson, A. 1999. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2): 350–383.
- [8]. Giddens, A. 1991. *Modernity and self-identity: Self and society in the late modern age*. Stanford, CA: Stanford University Press.
- [9]. Glikson, A., & Woolley, A. W. 2020. Human trust in artificial intelligence: Review of empirical research. *Academy of Management Annals*, 14(2): 627–660.
- [10]. Huy, Q. N. 2002. Emotional balancing of organizational continuity and radical change: The contribution of middle managers. *Administrative Science Quarterly*, 47(1): 31–69.
- [11]. Jarrahi, M. H. 2018. Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons*, 61(4): 577–586.
- [12]. Kahn, W. A. 1990. Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4): 692–724.
- [13]. Kellogg, K. C., Valentine, M. A., & Christin, A. 2020. Algorithms at work: The new contested terrain of control. *Academy of Management Annals*, 14(1): 366–410.
- [14]. Li, J., & Huang, J.-S. 2020. Dimensions of artificial intelligence anxiety based on the integrated fear acquisition theory. *Technology in Society*, 63: 101410.
- [15]. Long, D., & Magerko, B. 2020. What is AI literacy? Competencies and design considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*: 1–16. New York, NY: ACM.
- [16]. Noy, S., & Zhang, W. 2023. Experimental evidence on the productivity effects of generative artificial intelligence. *Science*, 381(6654): 187–192.
- [17]. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., et al. 2021. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372: n71.
- [18]. Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. 2008. The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research*, 19(4): 417–433.
- [19]. Raisch, S., & Krakowski, S. 2021. Artificial intelligence and management: The automation-augmentation paradox. *Academy of Management Review*, 46(1): 192–210.

- [20]. Rouvroy, A., & Berns, T. 2013. Algorithmic governmentality and prospects of emancipation: Disparateness as a precondition for individuation through relationships? *Réseaux*, 177(1): 163–196.
- [21]. Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. 2002. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1): 71–92.
- [22]. Siegel, R., König, C. J., & Lazar, V. 2022. The impact of electronic monitoring on employees' job satisfaction, stress, performance, and counterproductive work behavior: A meta-analysis. *Computers in Human Behavior Reports*, 8: 100227.
- [23]. Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. 2007. The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1): 301–328.
- [24]. Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. 2019. Good gig, bad gig: Autonomy and algorithmic control in the global gig economy. *Work, Employment and Society*, 33(1): 56–75.