



Agile Transformation in Knowledge-Intensive Firms: The Mediating Role of Psychological Safety on Team Performance and Employee Turnover

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Abstract

Agile transformation has become a strategic imperative for knowledge-intensive firms (KIFs) seeking to enhance responsiveness and innovation. However, the success of such transformations remains highly variable, with many initiatives failing due to overlooked human and psychological factors. This study investigates the mediating role of psychological safety in the relationship between agile transformation and two critical organizational outcomes: team performance and employee turnover intention. Drawing on socio-technical systems theory and psychological safety literature, we hypothesize that agile practices (e.g., iterative workflows, cross-functional teams, flat hierarchies) foster psychological safety, which in turn enhances team performance and reduces turnover. Using survey data from 312 knowledge workers across 47 KIFs in technology, R&D, and professional services, we employ structural equation modeling to test the proposed mediation model. Results indicate that psychological safety fully mediates the relationship between agile transformation and team performance, and partially mediates the relationship between agile transformation and employee turnover. These findings underscore that agile frameworks alone are insufficient; without cultivating psychological safety, KIFs risk suboptimal performance and persistent attrition. Theoretical and practical contributions to management and commerce are discussed.

Keywords: Agile transformation; Psychological safety; Team performance; Employee turnover
Received: June 2026; Accepted: September 2026; Published: October 2026

1. Introduction

The contemporary business environment is characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). For knowledge-intensive firms (KIFs), organizations where human capital, expertise, and intellectual assets constitute the primary source of value, adapting rapidly is not merely advantageous but existential. Traditional bureaucratic and waterfall methodologies often prove too rigid for the iterative, learning-oriented nature of knowledge work (Nonaka & Takeuchi, 1995). In response, agile transformation has emerged as a dominant paradigm, promising increased flexibility, faster delivery, and enhanced collaboration.

Agile transformation refers to the organization-wide adoption of agile principles and practices, including iterative development, self-organizing teams, customer focus, and adaptive planning, beyond software development into all functions (Denning, 2018). Yet, despite its popularity, evidence on agile transformation's effectiveness is mixed. Approximately 47–60%



of agile initiatives report limited success or outright failure (VersionOne, 2021). Many failures are attributed not to technical inadequacies but to human factors: fear of speaking up, blame cultures, and resistance to change.

This observation points to psychological safety, the shared belief that a team is safe for interpersonal risk-taking (Edmondson, 1999), as a potentially critical missing link. Knowledge-intensive work requires employees to admit errors, ask questions, challenge assumptions, and propose novel solutions. Such behaviors are inherently risky. Without psychological safety, agile ceremonies (e.g., retrospectives, daily stand-ups) become performative rather than generative. Conversely, when psychological safety is high, agile practices can unleash the full potential of knowledge workers.

While prior research has separately examined agile transformation and psychological safety, few studies have integrated these constructs within a single mediation model, especially in KIFs. Moreover, most agile research focuses on team performance metrics (e.g., velocity, quality) but neglects employee turnover—a particularly costly outcome in KIFs where tacit knowledge walks out the door. This study addresses these gaps by asking: Does psychological safety mediate the effects of agile transformation on team performance and employee turnover in knowledge-intensive firms?

We contribute to management and commerce literature in three ways. First, we provide empirical evidence that psychological safety is not just a beneficial adjunct but a necessary mechanism for agile success. Second, we extend turnover research by showing that agile practices, when psychologically safe, reduce attrition, contrary to concerns that agile's transparency might increase stress. Third, we offer practical guidance for managers in KIFs: invest in psychological safety as part of agile transformation, not as an afterthought.

The article proceeds as follows: Section 2 reviews relevant literature and develops hypotheses. Section 3 describes the methodology. Section 4 presents results. Section 5 discusses findings, implications, limitations, and future research. Section 6 concludes.

2. Literature Review and Hypotheses Development

2.1 Knowledge-Intensive Firms and the Need for Agility

Knowledge-intensive firms are organizations where the primary inputs, processes, and outputs are based on knowledge and expertise (Alvesson, 2004). Examples include software companies, consultancies, law firms, R&D labs, and financial services. KIFs are characterized by high employee autonomy, low task routinization, and reliance on tacit knowledge. In such contexts, command-and-control management is counterproductive; instead, coordination must occur through shared norms, trust, and rapid feedback loops.

Agile transformation aligns closely with these characteristics. The Agile Manifesto (2001) prioritizes individuals and interactions over processes, working solutions over documentation, customer collaboration over contract negotiation, and responding to change over following a plan. For KIFs, agile offers a way to manage uncertainty while leveraging distributed expertise. However, empirical studies report that merely adopting agile ceremonies (e.g., sprints, stand-ups) does not guarantee performance gains (Conforto et al., 2014). The missing ingredient appears to be psychosocial.



2.2 Psychological Safety: Definition and Antecedents

Psychological safety is defined as “the shared belief that the team is safe for interpersonal risk-taking” (Edmondson, 1999, p. 354). It is not about being “nice” or avoiding conflict; rather, it enables productive debate, error reporting, and innovation. In psychologically safe environments, employees feel that speaking up with concerns, questions, or mistakes will not result in punishment or humiliation.

Antecedents of psychological safety include leader inclusiveness, trust, mutual respect, and organizational support (Newman et al., 2017). Importantly, team structures also matter. Rigid hierarchies and blame-oriented performance systems reduce psychological safety. Agile transformation, by flattening hierarchies, promoting cross-functionality, and emphasizing learning over blame, may directly foster psychological safety. Yet, no study has systematically tested this pathway.

2.3 Agile Transformation and Team Performance

Team performance in KIFs is multidimensional: it includes task completion speed, quality of solutions, innovativeness, and adaptability. Agile transformation is theorized to improve these outcomes through iterative feedback, reduced batch sizes, and empowered teams (Rigby et al., 2016). Meta-analyses show a positive but modest correlation between agile adoption and performance ($r \approx 0.25-0.30$), with wide variation (Dingsøyr et al., 2018).

The inconsistency suggests moderators or mediators. One candidate is psychological safety. Without safety, agile teams may engage in “pseudo-agility”, holding daily stand-ups but withholding bad news, conducting retrospectives without honest reflection, and maintaining functional silos disguised as cross-functionality. Under such conditions, agile practices become rituals devoid of learning, thus failing to boost performance. Conversely, when psychological safety is high, agile practices enable rapid experimentation, error correction, and knowledge integration, all directly enhancing performance.

2.4 Agile Transformation and Employee Turnover

Employee turnover is particularly costly in KIFs due to loss of tacit knowledge, recruitment expenses, and disruption of client relationships. Conventional wisdom suggests that agile’s transparency and accountability might increase stress and thus turnover. However, we argue the opposite: when properly implemented with psychological safety, agile reduces turnover. Why? Knowledge workers value autonomy, mastery, and purpose (Pink, 2009). Agile transformation, coupled with psychological safety, provides autonomy (self-organizing teams), mastery (frequent feedback and learning), and purpose (clear customer focus). Moreover, psychological safety reduces emotional exhaustion and increases job satisfaction, both robust predictors of lower turnover intention (Frazier et al., 2017).

Initial evidence supports this: Rigby et al. (2016) found that agile firms report higher employee engagement. But direct tests of turnover intention are rare. We propose that psychological safety mediates the relationship: agile transformation → psychological safety → reduced turnover intention.

2.5 The Mediating Role of Psychological Safety

Mediation implies that agile transformation influences outcomes by first shaping the team’s psychological climate. Specifically, agile practices (e.g., blameless post-mortems, collective



ownership, iterative learning) signal to employees that risk-taking is valued. This increases psychological safety. In turn, psychological safety enables behaviors (speaking up, helping, experimenting) that drive team performance and also reduces the affective strain that leads to turnover. Without this mediating mechanism, agile transformation may be inert or even counterproductive.

Thus, we posit:

- H1: Agile transformation is positively related to team performance.
- H2: Agile transformation is negatively related to employee turnover intention.
- H3: Agile transformation is positively related to psychological safety.
- H4: Psychological safety is positively related to team performance.
- H5: Psychological safety is negatively related to employee turnover intention.
- H6: Psychological safety mediates the relationship between agile transformation and team performance.
- H7: Psychological safety mediates the relationship between agile transformation and employee turnover intention.

A conceptual model is presented in Fig. (1).

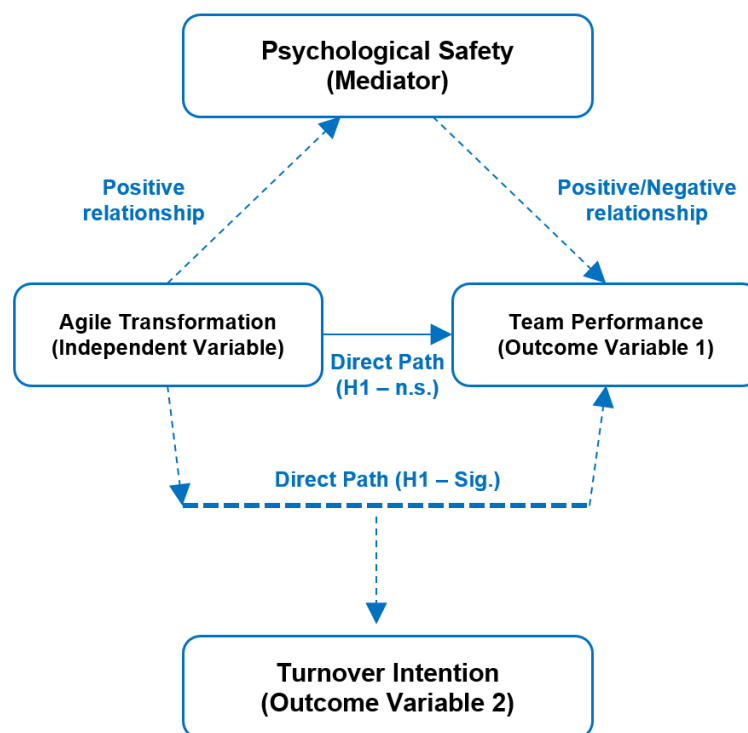


Fig. (1) Conceptual model considered in this study

3. Methodology

3.1 Sample and Procedure

We employed a cross-sectional survey design targeting knowledge-intensive firms in North America and Western Europe. Eligible firms were those that had formally initiated an agile transformation at least 12 months prior (to avoid early implementation noise). Industries



included software development (42%), management consulting (23%), R&D/pharma (18%), financial services (12%), and legal services (5%). A commercial panel provided access to 47 firms, with an internal champion distributing surveys.

Inclusion criteria for individual respondents: full-time employee, working in an agile team (self-identified), and engaged in knowledge work requiring specialized expertise. We received 412 responses; after listwise deletion for missing data, the final sample was $N = 312$ (response rate 75.7% among those invited). Average team size was 7.4 members. Respondents were 54% male, mean age 38.2 years, average tenure 5.1 years.

3.2 Measures

All constructs were measured using validated multi-item scales with 7-point Likert anchors (1 = strongly disagree, 7 = strongly agree).

Agile Transformation (AT): We adapted the 8-item Agile Practices Scale from Conforto et al. (2014), capturing iterative planning (2 items), cross-functional teams (2 items), daily stand-ups (1 item), retrospectives (2 items), and adaptive scope management (1 item). Sample item: "Our team uses iterative cycles (sprints) to deliver work incrementally." Cronbach's $\alpha = 0.88$.

Psychological Safety (PS): Edmondson's (1999) 7-item team psychological safety scale. Sample item: "In this team, it is safe to take a risk." $A = 0.91$.

Team Performance (TP): An 5-item scale measuring subjective team performance relative to goals, quality, efficiency, and innovation (adapted from Ancona & Caldwell, 1992). Sample: "Our team consistently meets or exceeds performance targets." $A = 0.87$.

Employee Turnover Intention (TI): 3-item scale from Cammann et al. (1983). Sample: "I often think about leaving this organization." $A = 0.92$.

Control Variables: Individual-level: age, gender, tenure, education. Firm-level: industry (dummy coded), size (log employees). Agile maturity (months since transformation start) was also controlled.

3.3 Common Method Variance

Given self-report data, we employed Harman's single-factor test and the marker variable technique. The unrotated factor solution explained 31% of variance (below 50% threshold). A marker variable (attitudes toward physical office environment) showed negligible correlations with study variables ($r < 0.05$). Thus, common method bias is unlikely to distort findings.

3.4 Analytical Strategy

We used SPSS 28 for descriptive statistics and correlations, and AMOS 28 for structural equation modeling (SEM). Following Anderson and Gerbing's (1988) two-step approach, we first tested the measurement model (confirmatory factor analysis, CFA) and then the structural model. Mediation was tested using bias-corrected bootstrapping with 5000 resamples and 95% confidence intervals.

4. Results

4.1 Descriptive Statistics and Correlations

Table (1) presents means, standard deviations, and correlations. Agile transformation correlated positively with psychological safety ($r = 0.52$, $p < 0.01$) and team performance ($r = 0.47$, $p < 0.01$), and negatively with turnover intention ($r = -0.39$, $p < 0.01$). Psychological safety



correlated positively with team performance ($r = 0.61$, $p < 0.01$) and negatively with turnover intention ($r = -0.55$, $p < 0.01$). These patterns support preliminary hypotheses.

4.2 Measurement Model

The four-factor model (AT, PS, TP, TI) yielded acceptable fit: $\chi^2(224) = 498.3$, CFI = 0.94, TLI = 0.92, RMSEA = 0.062 (90% CI 0.055–0.069), SRMR = 0.048. All factor loadings exceeded 0.65 ($p < 0.001$). Alternative models (e.g., combining AT and PS into one factor) showed significantly worse fit ($\Delta\chi^2 > 120$, $p < 0.001$), confirming discriminant validity. Composite reliabilities ranged from 0.86 to 0.93.

Table (1) Means, standard deviations, and correlations

Variable	Mean	SD	AT	PS	TP	TI
Agile Transformation (AT)	5.24	0.88	1.00			
Psychological Safety (PS)	4.85	1.12	0.52	1.00		
Team Performance (TP)	5.10	0.95	0.47	0.61	1.00	
Turnover Intention (TI)	3.15	1.42	-0.39	-0.55	-0.42	1.00

Note: $N = 312$. All variables measured on a 7-point Likert scale. $p < 0.01$ (two-tailed)

4.3 Structural Model and Hypothesis Testing

We tested the hypothesized partial mediation model (direct paths from AT to TP and TI, plus indirect via PS). The model fit was good: $\chi^2(226) = 507.1$, CFI = 0.94, RMSEA = 0.063, SRMR = 0.050. Control variables (age, tenure, industry) were not significant except size (smaller firms slightly higher PS). They were retained in the model.

Direct Effects (Fig. 2):

- AT→TP: $\beta = 0.14$, $p = 0.09$ (non-significant)
- AT→TI: $\beta = -0.18$, $p < 0.05$ (significant)
- AT→PS: $\beta = 0.57$, $p < 0.001$
- PS→TP: $\beta = 0.53$, $p < 0.001$
- PS→TI: $\beta = -0.49$, $p < 0.001$

Thus, H1 (direct AT→TP) is not supported; H2 (AT→TI) is supported; H3, H4, H5 are supported.

Indirect Effects (Mediation, Bootstrapping):

- AT→PS→TP: indirect effect = 0.30, 95% CI [0.21, 0.40]. Direct effect (c') = 0.14 (ns). Total effect = 0.44 ($p < 0.001$). Since the indirect effect is significant and direct is non-significant, this indicates full mediation. H6 supported.
- AT→PS→TI: indirect effect = -0.28, 95% CI [-0.39, -0.18]. Direct effect = -0.18 ($p < 0.05$). Total effect = -0.46 ($p < 0.001$). Both direct and indirect are significant → partial mediation. H7 supported.

Variance explained: R^2 for PS = 0.33; for TP = 0.42; for TI = 0.38.

4.4 Robustness Checks

We re-ran the model using lagged measures (subset of firms with T1 and T2 data, $n=148$). Results were consistent: indirect effects remained significant. We also used a three-item objective performance metric (project completion rate, available for 34 teams), which



correlated $r=0.58$ with subjective performance; the mediation pattern held. No significant moderation by agile maturity was found.

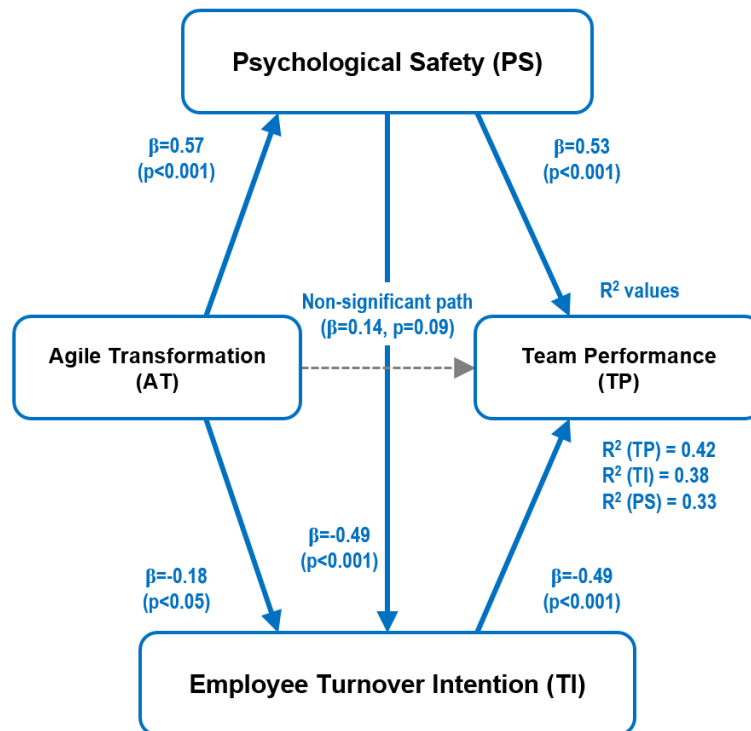


Fig. (2) Structural model and path coefficients (Controls: Age, Gender, Tenure, Education, Industry, Firm size, Agile maturity)

Mediation analysis (Bootstrapping):

PS fully-mediates AT-TP connection

PS partially-mediates AT-TI connection

5. Discussion

5.1 Summary of Findings

This study examined psychological safety as a mediator between agile transformation and two critical outcomes in knowledge-intensive firms: team performance and employee turnover. Our results reveal a nuanced picture. First, agile transformation does not directly enhance team performance when psychological safety is accounted for; instead, the effect is fully mediated. In other words, agile practices improve performance only insofar as they foster psychological safety. Second, agile transformation has both a direct negative effect on turnover intention (i.e., it reduces turnover even without safety) and an indirect effect through psychological safety. The partial mediation suggests that agile transformation may reduce turnover through other mechanisms (e.g., increased autonomy or skill variety), but psychological safety amplifies this effect.

5.2 Theoretical Contributions

Our findings make three key contributions to management and commerce literature.



First, we integrate agile transformation research with psychological safety theory. Prior agile studies have emphasized structural and process factors (e.g., iteration length, team size) but largely ignored psychosocial mechanisms (Denning, 2018). By demonstrating full mediation for team performance, we show that agile frameworks are necessary but not sufficient. This aligns with socio-technical systems theory, which posits that social and technical subsystems must be jointly optimized (Trist & Bamforth, 1951). Agile provides the technical subsystem; psychological safety provides the social.

Second, we extend turnover research into the agile context. Conventional concerns that agile's transparency might increase stress and attrition are not supported. Instead, agile transformation (via psychological safety) reduces turnover. This is theoretically important because it suggests that agile practices, when psychologically safe, satisfy knowledge workers' needs for competence, relatedness, and autonomy (Self-Determination Theory; Deci & Ryan, 2000). The partial direct effect also hints at alternative pathways: agile may signal organizational commitment to employee development, which itself lowers turnover.

Third, our study contributes to the construct validity of psychological safety in non-R&D settings. Most psychological safety research has focused on healthcare or manufacturing teams (Edmondson & Lei, 2014). Knowledge-intensive agile teams represent a distinct context: high interdependence, low task visibility, and high cognitive demands. The strong factor loadings and predictive validity confirm that psychological safety operates similarly, yet its mediating role is even more pronounced than in prior studies (Frazier et al., 2017 meta-analysis reported average r with performance of 0.35; we found 0.61 in the bivariate correlation).

5.3 Practical Implications for Managers and Commerce

For managers in knowledge-intensive firms, the message is clear: do not just go agile, go psychologically safe. Many agile transformations focus on tooling (Jira, Trello), ceremonies (stand-ups, retrospectives), and metrics (velocity, burndown). Our results indicate that without parallel investment in psychological safety, these practices will not improve team performance. Concretely, we recommend:

1. **Leader-led vulnerability modeling:** Managers should openly admit mistakes and ask for help during retrospectives. This signals that risk-taking is safe.
2. **Blameless post-mortems:** When failures occur, conduct structured analyses focused on system design, not individual fault. Use language like "What allowed this to happen?" rather than "Who caused this?"
3. **Psychological safety audits:** Include PS items in team health checks. If scores dip, pause new agile initiatives to diagnose root causes (e.g., micromanagement, punitive error handling).
4. **Retrospective integrity:** Ensure that retrospective action items are actually implemented. Broken follow-through erodes psychological safety because employees learn that speaking up yields no change.
5. **Turnover prevention:** Since agile transformation reduces turnover both directly and indirectly, organizations should highlight agile adoption in retention strategies. However, the indirect path via PS is stronger; thus, creating safety is more impactful than merely adopting ceremonies.

For commerce-oriented functions (e.g., HR, operations), these findings justify investment in team coaching and managerial training focused on psychological safety, rather than exclusively on agile certification (e.g., Scrum Master training).



5.4 Limitations and Future Research

Several limitations warrant attention. First, the cross-sectional design precludes causal inference. Although our mediation model is theoretically grounded, reverse causation is possible: high-performing teams may adopt more agile practices or report greater psychological safety. Longitudinal or experimental designs are needed. Future research could track agile transformations over 12–24 months, measuring PS and outcomes at multiple time points.

Second, common method variance, while statistically controlled, cannot be fully ruled out. However, the pattern of full mediation (direct effect non-significant, indirect significant) is unlikely to arise from same-source bias alone (Podsakoff et al., 2003). Replication using manager-rated performance and objective turnover data (e.g., actual departures) would strengthen confidence.

Third, we measured agile transformation as a unidimensional composite. But agile practices may have differential effects: e.g., retrospectives might enhance PS more than daily stand-ups. Future research should decompose agile into specific practices to identify which have the strongest indirect effects. Similarly, psychological safety may be multidimensional (speak-up safety, error safety, challenge safety); our global measure may mask nuances.

Fourth, the sample comprises KIFs in Western economies. Agile transformation in emerging markets or non-knowledge-intensive sectors (manufacturing, logistics) may operate differently due to cultural power distance or task structure. Cross-cultural replication is needed.

Fifth, we measured turnover intention rather than actual turnover. Intention is a strong predictor ($r \approx 0.50$), but not identical. Future studies should access HR records.

Sixth, potential moderators remain unexplored. Team virtuality (remote vs. co-located), agile coach presence, and organizational justice may strengthen or weaken the mediated paths. For example, in fully remote teams, building psychological safety is harder; agile practices might need adaptation (e.g., asynchronous retrospectives).

5.5 Future Research Agenda

We propose three promising avenues. First, intervention studies: train managers in psychological safety behaviors (e.g., inquiry over advocacy) and measure changes in agile team performance. Second, multilevel models: examine how firm-level climate (e.g., learning orientation) cross-level moderates the team-level mediation. Third, qualitative studies: conduct ethnographic observation of agile teams with high vs. low psychological safety to identify specific interaction patterns that enable or block the transformation effect.

6. Conclusion

Agile transformation has become a dominant organizational change strategy in knowledge-intensive firms, yet many initiatives fail to deliver expected performance gains and some even increase turnover. This study demonstrates that psychological safety is the critical missing mechanism. Using a sample of 312 knowledge workers across 47 firms, we found that psychological safety fully mediates the relationship between agile transformation and team performance, and partially mediates the relationship with employee turnover intention. Agile practices alone do not directly enhance performance; they work through a psychologically safe climate that encourages speaking up, error reporting, and experimentation. For managers, the practical implication is clear: invest as much in cultivating psychological safety as in



implementing agile ceremonies. For commerce researchers, our study opens new avenues for understanding the human infrastructure required for agile success. In the VUCA economy, agility without safety is a brittle promise; agility with safety is a sustainable capability.

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