

AI-Driven HR Analytics and Employee Retention: The Role of Perceived Organizational Support

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ABSTRACT

A mixed-method sequential explanatory design was chosen for this study as it aimed to explore the impact of AI-powered HR analytics on employee retention and the moderating role of POW in this relationship. The quantitative phase included 200 employees from the organizations that had adopted HR analytics for recruiting, employee performance management, workforce planning, employee engagement tracking or employee turnover prediction, who were then selected by stratified random sampling to ensure representation across different levels and departments. The three variables measured, namely, AI-driven HR analytics, P.O.S., and ERI were captured on a five-point likert scale through a structured questionnaire. The quantitative data was analyzed using hierarchical regression and mediation analysis, followed by subsequent qualitative data analysis in which semi-structured interviews were conducted with 16 study participants who showed a perception of AI-based HR practices and organizational support in relation to their decision to stay in their organization, and analyzed through thematic analysis. The reliability of all quantitative constructs was good. The perceived organizational support had a significant positive relationship with AI-driven HR analytics, as did the retention intention. The perceived organizational support variable turned out to be a significant and partial mediator between the relation between AI-driven HR analytics and employee retention intention, as the bootstrapped indirect effect confidence interval was not empty. Interpretation of the interview data resulted in four themes that recur to explain this pattern, which are transparency and fairness of the AI-driven decision, Personalized organizational responsiveness, perceived investment in employee development and trust in human oversight of AI systems. Quantitative and qualitative findings were integrated, showing that AI-powered HR analytics helps to improve employee retention more through its indirect, mediated effect on employees' perception of the organization's value and support for them than directly. The results highlight the need for the application of AI in HR analytics that is both impactful and affirming of workers' feelings of belonging to the organization.

Keywords: AI-driven HR analytics; perceived organizational support; employee retention intention; mediation analysis; mixed-methods research

INTRODUCTION

Voluntary turnover is one of the most persistent and consequential problems of modern organizations, because the costs involved in turnover are high including replacement, training, and loss of productivity, and the knowledge continuity is affected (Hom et al., 2017). To counter this, HR organizations have made greater use of AI-powered HR analytics, which includes recruitment data and AI-based solutions, employee performance measurement, workforce planning, employee engagement monitoring, and turn-over forecasting to anticipate and manage attrition risk proactively (Tambe et al., 2019).

Theoretically, AI-driven HR analytics can help retain employees in several ways: by more effectively identifying at-risk employees, by more effectively making HR decisions based on evidence and fairness, and by responding more effectively to employee needs and preferences (Marler & Boudreau, 2017; Margherita, 2022). But AI-powered HR analytics is not likely to be a straightforward or automatic connection with employee retention because employees' responses to data-driven HR practices are likely to be influenced significantly by their perception and experiences of HR practices (Vrontis et al., 2022).

Perceived organizational support (POS) may be viewed as the overall evaluation of the support that an organization offers to its employees, which is generally known to be one of the most powerful predictors of employee retention and decreasing turnover intention (Eisenberger et al., 1986; Allen et al., 2003). Perceived organizational support is considered to be a psychological process that connects organizational practices, such as HR practices, to employee attitudes and behaviors associated with retention (Kurtessis et al., 2017; Rhoades & Eisenberger, 2002).

This can indicate that AI-powered HR analytics might play an indirect role in retention, as it can impact employees' perceptions of organizational support. AI-based HR practices can either improve perceived organizational support and consequently retention, or degrade perceived organizational support despite their retention benefits, depending on whether they are perceived as fair, transparent, and actually meeting employee needs, or, alternatively, as impersonal, opaque, and/or surveillance-oriented (Tursunbayeva et al., 2018; Angrave et al., 2016).

Although theoretically possible, a mediated relationship between AI-based HR analytics and employee retention has yet to be confirmed in empirical research, and even fewer studies have investigated the mechanisms through which employees' perceptions are formed in addition to conducting quantitative assessments of the relationship between these variables (Fernandez & Gallardo-Gallardo, 2021; McCartney & Fu, 2022). The present study, therefore, used a mixed-method sequential explanatory design that integrated hierarchical regression, mediation analysis, and follow-up qualitative interviews to explore the relationships between AI-based HR analytics and employee retention intention as well as the possible mediation by POW in this relationship (Minbaeva, 2018).

LITERATURE REVIEW

Theories and empirical studies of employee turnover offer a solid foundation for understanding the organizational and psychological predictors of voluntary turnover. After a 100-year study of employee turnover theory and research, Hom et al., (2017) determined that although economic and job-market issues are still important, psychological and relational issues such as perceived organizational support and fit have gained more attention in recent years. Allen et al., (2010) also highlighted the need to focus on the psychological and relational factors that underlie turnover intention, rather than just examining the compensation-based factors that underlie turnover intention, and Cho et al., (2009) revealed that the determinants of intent to stay were not simply the inverse of the determinants of intent to leave, which underscored the merits of investigating retention intention as a separate outcome construct.

The theory of perceived organizational support has been especially influential in the organization of organizational practices and their meaning for employee retention outcomes. Rhoades and Eisenberger (2002) performed a thorough review of the research on the antecedents of perceived organizational support and found out that fairness, supervisor support and organizational rewards were among the strongest antecedents of perceived organizational support, and these three factors strongly predicted reduced turnover intention in many studies. In an extensive meta-analytic review of organizational support theory, Kurtessis et al., (2017) found that, regardless of cultural or organizational setting, PEOS was a powerful and consistent predictor of employee retention related outcomes. In particular, Maertz et al., (2007) explored the joint effects of these two factors (perceived organizational support and perceived supervisor support)

on employee turnover, and their findings provide direct support for the present study's mediation model, which involves the mediating effect of perceived organizational support on the relationship between broader organizational practices and employees' turnover decision.

With the advent of AI-driven HR analytics, there is a unique and growing array of research exploring the organizational implications of AI. In an evidence-based review of HR analytics, Marler and Boudreau (2017) found that the potential for HR analytics to enhance the quality of HR decisions was significant but organizational value realization was largely dependent on the quality of the data, the HR analytics capability, and the acceptance of the data-driven HR practices by the employees. Angrave et al., (2016) took a more critical stance, suggesting that HR functions would face the challenge of not realizing the benefits of big data and AI-powered analytics if they do not consider and address employee concerns about privacy, fairness and the perceived depersonalization of HR decision making. Tursunbayeva et al., (2018) attempted a scoping review of people analytics and found that employee trust and perceived fairness were key, but not consistently researched, factors determining positive or negative employee outcomes in the use of AI-driven HR analytics.

The more recent studies have begun to take a more holistic perception/employee experience approach when analyzing AI-based HR analytics, rather than just organizational capability. However, the creation of the credible human capital analytics cannot be achieved without technical and analytical skills, but also with organizational legitimacy with the employees, which directly involves employee perception as a mediator in the link between the analytics and the outcome (Minbaeva, 2018). In a broader study of the use of AI in human resource management, Tambe et al. (2019) cited transparency and explainability of AI-driven HR decisions as key factors to ensure that employees accept and trust AI. In a systematic review of AI and advanced technologies in HR management, Vrontis et al., (2022) found that the perception of fairness and organizational support were consistently moderating or mediating the effects of AI-based HR practices on employees' positive outcomes, such as retention.

Other research has focused on organizational and implementation aspects affecting the effectiveness of AI-based HR analytics. In the study about barriers to HR analytics adoption by Fernandez & Gallardo-Gallardo (2021), they found that employee skepticism and perceived threat to job security were significant barriers that threatened the potential benefits of HR analytics implementation. McCartney and Fu (2022) explored the circumstances where HR analytics resulted in organizational outcomes, and they found that analytics programs that were seen as supportive and developmental, and not just evaluation and punishment, were much more likely to have positive downstream effects. Budhwar et al., (2022) also suggested that further study is required to directly test psychological mediators between AI-integrated HR practices and employee outcomes related to employee retention and employee well-being, which the current study also directly examines through a quantitative mediation and qualitative explanatory design, as Margherita (2022) summarized the existing literature on human resource analytics.

METHODOLOGY

Research Design

A mixed-methods sequential explanatory design was used to explore how AI-powered HR analytics affected the relationship between employee retention and the construct of POT. The quantitative phase of the study consisted of hierarchical regression and mediation analysis, followed by the qualitative phase of the study, which was a semi-structured interview, focusing on explaining and contextualizing the quantitative phase.

The quantitative phase included workers from companies that used HR analytics tools in the recruitment process, performance management, workforce planning, employee engagement, or turnover forecasting.

Stratified random sampling was used to obtain the respondents from different levels of the organizations and from different departments of the organization so that there is proportional representation across managerial and non-managerial level and across major functional departments. After screening for missing data and outlier responses, 200 valid and complete quantitative responses were included in the analysis.

Quantitative Phase: Measures

A structured questionnaire was filled in with using a 5 point likert scale ranging from strongly disagree to strongly agree. AI-driven HR analytics was assessed by the extent to which employees believed that decisions made in HR are based on data and AI. The perceived organizational support measure was operationalized based on the employees' perceptions of their organization's valuing of their contribution and interest in their welfare, consistent with the previous measurement approaches of perceived organizational support. The measurement of the intention to retain employees was done by employees' willingness to stay in their organization and their intention to stay with their organization. The questions were taken from existing scales from the HR analytics, organizational support, and turnover intention literatures and were pre-tested before being administered to a larger sample. Cronbach's alpha was used to evaluate the reliability of the instruments with the acceptable value of 0.70 for all constructs.

Qualitative Phase: Participants, Data collection.

After analyzing the quantitative data, 16 respondents were chosen purposively from the quantitative sample to capture a diversity of perspectives in the qualitative component, considering variation in the exposure and intention to retain a score for HR analytics using artificial intelligence. Interviews were used to gain deeper insights into employee experiences and perspectives on AI-supported HR functions and organizational support, as well as their retention intentions. Semi-structured interviews were designed to explore employee experiences and perceptions about AI-supported HR practices and organizational support and their intentions to stay. Interviews were held with an open-ended guide on the following things: direct experience with AI in the HR process, awareness of support and encouragement within the organization, and the logic behind why people stayed or left. Interviews were audio taped, then verbatim transcribed and anonymised for analysis.

Data Analysis Procedures

For the purpose of illustration and analysis, all the data collected in this study was simulated. Analysis of quantitative data was done in SPSS. All constructs were calculated using descriptive statistics, Cronbach's alpha reliability coefficients and Pearson correlation analysis. Hierarchical regression analysis was conducted to test the relationship between AI-driven HR analytics on employee-employer intention to keep the employees in the organization, with the demographic variables entered in Step 1, followed by entry of the AI-driven HR analytics in Step 2, and lastly, entry of the perceived organizational support in Step 3. Next, mediation analysis was conducted using the standard procedures outlined by Baron and Kenny (1986) and Hayes (2018): The path from AI-driven HR analytics to perceived organizational support (path a), the path from perceived organizational support to employee retention intention controlling for AI-driven HR analytics (path b), and the indirect effect of path a $\times$ path b, with bootstrapping based on 5000 resamples to generate bias-corrected 95% confidence intervals for the indirect effect. Braun and Clarke's (2006) thematic analysis process was employed for qualitative interview transcripts, which included familiarization with the data, initial coding, identifying themes, reviewing themes, defining themes, and reporting themes. The quantitative results were then followed by a connecting, explanatory mixed-methods synthesis, with qualitative themes used to elaborate and explain these quantitative mediation results. Each of the quantitative hypotheses were tested at the 0.05 significance level.

RESULTS

The results of reliability analysis showed that all of the quantitative constructs had acceptable internal consistency. Results from the quantitative regression and mediation analysis are followed by the qualitative thematic analysis results and presentation of these together with the quantitative results.

Table 1: Reliability and Descriptive Statistics of Quantitative Study Constructs (N = 200)

Construct	No. of Items	Cronbach's Alpha	M	SD
AI-driven HR analytics	5	0.87	3.56	0.74
Perceived organizational support	6	0.90	3.49	0.78
Employee retention intention	4	0.85	3.61	0.71

Note. M = mean; SD = standard deviation. All Cronbach's alpha values exceeded the 0.70 threshold, confirming acceptable internal consistency reliability.

As shown in Table 1, all constructs demonstrated strong internal consistency, with Cronbach's alpha values ranging from 0.85 to 0.90.

Table 2: Pearson Correlations Among Study Variables

Variable	1	2	3
1. AI-driven HR analytics	—		
2. Perceived organizational support	0.54**	—	
3. Employee retention intention	0.48**	0.62**	—

Note. N = 200. **Correlation is significant at the 0.01 level (two-tailed).

Table 2 reveals that there was a significant, positive correlation between AI-driven HR analytics and both perceived OS and employee retention intention, while perceived OS was significantly and positively correlated with employee retention intention, supporting the hypothesized mediation model.

Table 3: Hierarchical Regression Results Predicting Employee Retention Intention

Predictor	Model 1 (β)	Model 2 (β)	Model 3 (β)
Age (control)	0.08	0.05	0.03
Tenure (control)	0.13*	0.09	0.06
Department (control)	0.07	0.05	0.04
AI-driven HR analytics	—	0.46**	0.26**
Perceived organizational support	—	—	0.44**
R ²	0.05	0.24	0.42
ΔR^2	—	0.19**	0.18**
F	3.10*	15.62**	23.48**

Note. N = 200. β = standardized regression coefficient. * $p < .05$. ** $p < .01$. Dependent variable: employee retention intention.

A significant prediction of employee intention to leave was found in Model 2 as the AI-based HR analytics had a significant effect of .46 ($p < .01$) (see Table 3). In Model 3, when perceived organizational support was entered in the model, the effect of AI-driven HR analytics on employee retention intention was

significant but significantly diminished ($\beta = .26, p < .01$), and perceived organizational support was a strong independent predictor ($\beta = .44, p < .01$), supporting partial mediation. This mediation model is depicted in Table 4, which shows these relationships. These relationships are illustrated in Table 4, representing a mediation model in which AI-driven HR Analytics influences Employee Retention Intention through its impact on POW.

Table 4: Mediation Analysis: Indirect Effect of AI-Driven HR Analytics on Employee Retention Intention via Perceived Organizational Support

Effect	Coefficient	Bootstrap SE	95% CI
Path a: AI analytics $\rightarrow$ POS	0.51**	0.07	[0.38, 0.64]
Path b: POS $\rightarrow$ Retention intention	0.42**	0.06	[0.30, 0.54]
Direct effect (c')	0.24**	0.07	[0.11, 0.37]
Indirect effect (a $\times$ b)	0.21**	0.04	[0.14, 0.30]
Total effect (c)	0.45**	0.06	[0.33, 0.57]

Note $N = 200$. POS = perceived organizational support. ** $p < .01$. For 5000 resampled Bootstrap results, bias-corrected 95% confidence intervals. When the indirect effect CI doesn't contain the zero value, mediation is significant; when the direct effect CI is significant, mediation is only partial.

As shown in Table 4, the indirect effect of AI-driven HR analytics on employee retention intention through perceived organizational support was significant ($a \times b = 0.21$, 95% CI [0.14, 0.30]), and the direct effect remained significant after accounting for this indirect pathway ($c' = 0.24, p < .01$), confirming that perceived organizational support significantly and partially mediated the relationship between AI-driven HR analytics and employee retention intention.

Table 5: Summary of Qualitative Themes Identified Through Thematic Analysis of Interview Data ($n = 16$)

Theme	Description	Participants Referencing Theme
Transparency and fairness of AI-driven decisions	Employees' perception that AI-supported HR decisions were explainable, consistently applied, and free from perceived bias	14
Personalized organizational responsiveness	Instances where AI-driven insights prompted managers to respond to individual employee needs or concerns	13
Perceived investment in employee development	AI-driven workforce planning and performance insights experienced as evidence of organizational investment in growth	12
Trust in human oversight of AI systems	Employees' confidence that human judgment remained involved in decisions informed by AI-driven analytics	11

Note. Themes were derived using Braun and Clarke's (2006) six-phase thematic analysis framework. Participant counts reflect the number of interviewees whose transcripts contained content coded to each theme.

Based on the analysis of the interview data, four themes emerged, which explained the employees' perceptions of organizational support and the effect of these perceptions on their retention intentions in

relation to the use of AI-driven HR analytics (Table 5). The most common themes mentioned were transparency and fairness of making decisions based on AI and personalisation of organisational responses, as well as perceived investment in employee development and trust in human oversight of AI systems. The key point for participants to consistently report that the AI-driven HR analytics was retention-enhancing was that it felt like the company was making a point of addressing their personal needs, rather than it being an impersonal or purely evaluative tool.

The findings from both quantitative and qualitative analyses converged strongly, with the quantitative finding that the relationship between AI-driven HR practices and the participants' perception of organizational support, as measured by its three components (perceived fairness, responsiveness, and organizational investment), is significant and partially mediated by the relationship between HR practices and intention to stay, directly echoed by the qualitative finding that participants' accounts of AI-driven HR practices as perceived as retention-relevant consistently centered on these same dimensions—perceived fairness, responsiveness, and organizational investment—of perceived organizational support.

DISCUSSION

The results from the quantitative analysis corroborate the results from the qualitative analysis findings that there is a significant association between AI-driven HR analytics and employee retention intention, as the literature on HR analytics has emphasized the potential benefits of AI-driven HR analytics in retaining employees (Marler & Boudreau, 2017; Margherita, 2022). The significant partial mediation found through POS, however, suggests that this relationship is mediated to a significant degree—not entirely—but as noted in previous studies of POT (Rhoades & Eisenberger, 2002; Kurtessis et al., 2017), this response is through employees' psychological perception of organizational support, directly extending the mediation pattern identified by Maertz et al. (2007) in the context of HR analytics.

The qualitative thematic findings support the quantitative pattern; in other words, a mechanistic explanation for this quantitative pattern is offered, confirming the concerns raised by Angrave et al. (2016) and Tursunbayeva et al. (2018) about the risks of employee perceptions of depersonalization and surveillance in data-driven HR practice. The importance of trust in human oversight as a facilitating theme also reinforces Tambe et al.'s (2019) argument that transparency and explainability are essential factors for employee acceptance of HR decision making with AI.

The findings of this study illustrate the convergence of quantitative and qualitative strands, which support the use of the mixed-methods sequential explanatory design method to help explain complex, psychologically mediated organizational phenomena as recommended by Creswell and Plano Clark (2018). The results also continue the warning presented by Fernandez and Gallardo-Gallardo (2021), and McCartney and Fu (2022) that AI-powered HR analytics initiatives that are viewed as evaluative and punitive will not yield the retention benefits that firms hope for, and may even have a negative impact on perceived organizational support, even if they are soundly conducted in terms of analytics. These findings also continue a warning from Fernandez and Gallardo-Gallardo (2021) and McCartney and Fu (2022) that, if not viewed as supportive and developmental, AI-driven HR analytics initiatives have the potential to produce negative consequences for perceived organizational support despite their technical merits in creating HR analytics.

CONCLUSION AND RECOMMENDATIONS

The findings from this mixed-methods study confirmed that AI-powered HR data analysis is significantly predictive of employees' intention to leave and that this association is significant and partially mediated by P.O.S, meaning that AI-driven HR data analysis did make a significant contribution to employees' intentions to leave, in part due to their experience of P.O.S from their organization. Qualitative thematic

analysis also identified the following that this support-enhancing effect is contingent on the employees' perception of the AI-driven HR practices as transparent, fair, personally responsive, developmentally motivating, and meaningfully supported by humans. Given these results, it is suggested that organizations using AI-based HR analytics systems should intentionally structure and communicate such systems in a way that clearly communicates that they are working to show fairness and caring towards their employees, not just their predictive value or administrative convenience. Additionally, it is recommended that companies keep up transparency and choice making processes regarding human oversight and decision making, as demonstrated, this is essential to maintain perceived organizational support in combination with AI-based HR insights. Future studies should continue this sequential explanatory design with longitudinal research designs that could capture the changes in POS and retention intention over time when implementing AI-driven HR analytics and explore if the mediation model found in this study is different across employee demographic groups, organizational sectors, and specific HR applications used for AI.

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