Investigate the Moderating Role of Motivation on the Relationship Between People Analytics and Employee Performance

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ABSTRACT
This study investigates the moderating role of motivation in the relationship between People Analytics (PA) and employee performance. Using a structural equation modeling (SEM) approach, data from 300 employees was analyzed to understand the pathways through which PA dimensions—Attraction (ATRCTN), Activation (ACTVTN), and Attraction Intensity (ATRITN)—impact employee performance. The results demonstrate that motivation amplifies the relationship between PA and performance, highlighting its critical moderating role. Practical implications for organizations aiming to enhance employee outcomes through PA are discussed.

Introduction

The use of People Analytics (PA) has transformed human resource management by providing data-driven insights to optimize workforce performance. PA encompasses tools and techniques that analyze workforce data to support decision-making (Levenson, 2018). However, its effectiveness varies significantly among employees, suggesting the presence of moderating factors.

Motivation, a psychological driver of effort and engagement, has long been recognized as essential in determining employee performance (Ryan & Deci, 2000). While PA provides valuable feedback and insights, employees' willingness to act on such insights depends on their intrinsic and extrinsic motivation levels.

This study aims to explore the moderating role of motivation in the relationship between PA and employee performance. Specifically, it examines three PA dimensions—Attraction (ATRCTN), Activation (ACTVTN), and Attraction Intensity (ATRITN)—and their interaction with motivation in influencing performance outcomes.

2. Literature Review

2.1 People Analytics and Employee Performance

PA encompasses the use of data-driven tools and techniques to understand and improve workforce-related outcomes (Levenson, 2018). By analyzing patterns in employee behavior, PA can identify gaps in performance, optimize workflows, and align individual contributions with organizational objectives (Angrave et al., 2016). Studies indicate that organizations implementing PA report increased productivity, improved decision-making, and enhanced employee satisfaction (Bassi, 2011).

Employee performance, defined as task execution and discretionary behaviors beyond formal job descriptions, is critical for organizational success (Campbell, 1990). While PA provides actionable insights, its effectiveness relies on employee receptivity and engagement.

2.2 Motivation and Employee Performance

Motivation is a central determinant of employee behavior and performance, categorized into:

1. **Intrinsic Motivation**: Driven by internal factors such as personal growth and satisfaction.

2. **Extrinsic Motivation**: Influenced by external rewards like pay, recognition, and promotion (Ryan & Deci, 2000).

Motivated employees demonstrate higher productivity, creativity, and adaptability (Locke & Latham, 2002). Studies highlight that motivational factors also influence how employees perceive and respond to managerial interventions (Gagné & Deci, 2005).

2.2 Motivation as a Moderator

Moderating variables affect the strength or direction of the relationship between two variables (Baron & Kenny, 1986). Motivation likely moderates the PA-performance relationship, amplifying PA's effectiveness for motivated employees while dampening its impact on less motivated ones. This underscores the need for integrating motivational strategies into PA-driven HR practices (Sparrow, 2016).

3. Methodology

The methodological framework of this study was designed to rigorously investigate the moderating role of motivation on the relationship between People Analytics (PA) and employee performance. Employing a quantitative research approach with structural equation modeling (SEM) as the primary analytical tool, the study ensured methodological rigor to test the proposed relationships and hypotheses.

3.1 Research Design

A **descriptive and explanatory research design** was adopted to meet the objectives of this study. The descriptive aspect aimed to explore the constructs of PA, motivation, and employee performance, while the explanatory design sought to examine causal relationships and test the moderating effects of motivation on the PA-performance linkage (Saunders et al., 2019).

3.1.1 Population and Sampling

- **Population**: The target population consists of employees from diverse industries, such as retail, IT, manufacturing, and healthcare, working in organizations utilizing PA systems.
- **Sampling Technique**: A **stratified random sampling** technique was employed to ensure adequate representation across industries and job roles (Creswell & Creswell, 2017).
- **Sample Size**: A total of 300 employees participated in the study. The sample size was determined based on the recommendations for SEM, which suggest a minimum sample-to-parameter ratio of 10:1 (Hair et al., 2010). This sample size ensured robust statistical power for detecting significant relationships and moderation effects.

3.2 Data Collection

The study utilized a structured survey questionnaire to collect data from respondents. The survey was designed to measure the key constructs and their interrelationships, ensuring validity and reliability.

1. **Survey Administration**:
- The survey was distributed online using platforms such as Google Forms.
- Respondents were provided with clear instructions and assured of confidentiality to encourage honest responses.
2. **Inclusion Criteria**:
- Respondents with at least 1 year of experience in their current role.
- Employees working in organizations with active PA systems.
3. **Response Rate**:
- Out of 450 distributed surveys, 300 valid responses were received, resulting in a response rate of **66.7%**.

3.3 Instrumentation

Validated scales were used to measure the constructs in the study. The instrument consisted of four sections, as outlined below:

1. **People Analytics Dimensions**:

- **Attraction (ATRCTN)**: Measured using a scale adapted from Levenson (2018), focusing on goal alignment, talent mapping, and identifying high-potential employees.
- **Activation (ACTVTN)**: Assessed based on actionable insights derived from PA, such as personalized training initiatives.
- **Attraction Intensity (ATRITN)**: Items measured the depth and specificity of PA interventions, including real-time feedback and individualized growth strategies.
- All items were rated on a **5-point Likert scale** ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

2. **Motivation**:

- Motivation was measured using the **Work Extrinsic and Intrinsic Motivation Scale (WEIMS)**, developed by Tremblay et al. (2009). This scale includes 18 items capturing both intrinsic and extrinsic motivation, rated on a **7-point Likert scale**.

3. **Employee Performance**:

- Employee performance was assessed using a customized scale based on Campbell's (1990) performance framework, which includes key performance indicators (KPIs) such as job quality, quantity, and timeliness.

4. **Demographic Variables**:

- Data on age, gender, education level, job role, and industry were collected to control for potential confounding effects.

.4 Data Analysis

A comprehensive analytical strategy was employed to test the relationships and moderation effects:

1. **Preliminary Data Screening**:

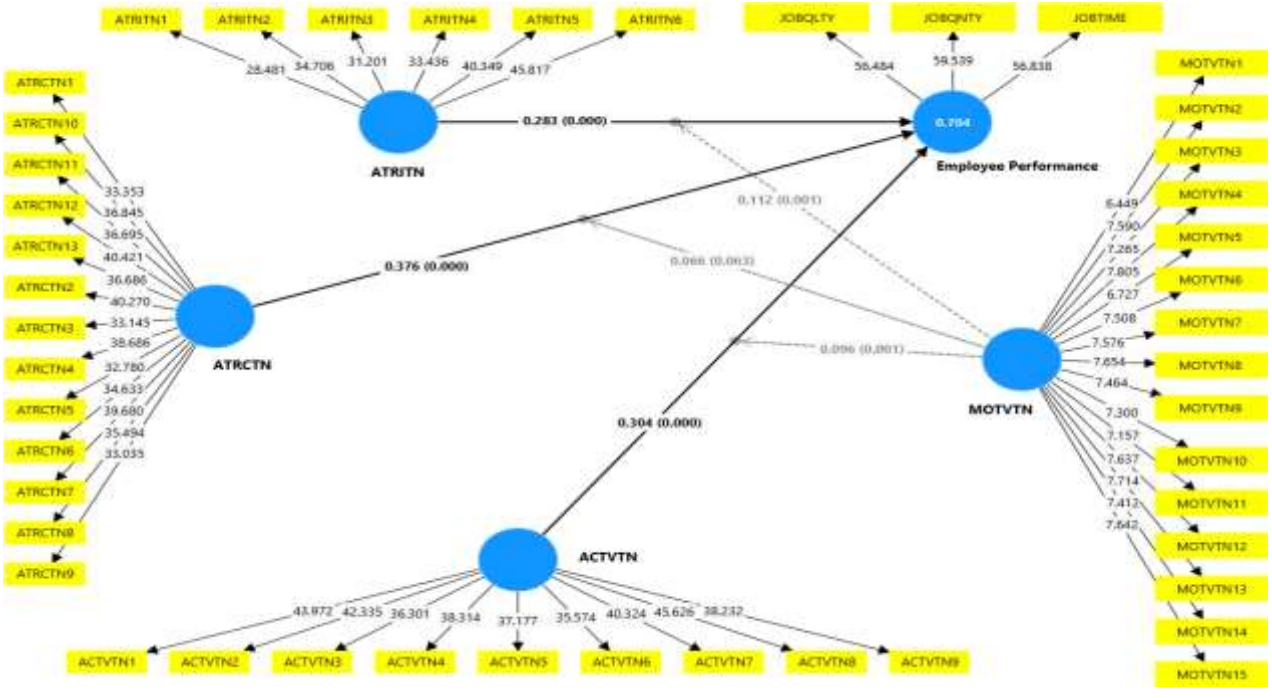
- Data were screened for missing values and outliers.
- Normality was assessed using skewness and kurtosis values, with acceptable thresholds of ±2 (Byrne, 2010).
- Reliability was tested using **Cronbach's alpha** (≥0.70), and construct validity was assessed through confirmatory factor analysis (CFA).

2. **Structural Equation Modeling (SEM)**:

- SEM was used to evaluate the direct and indirect effects among the constructs, as well as the moderation effects.
- Model fit was assessed using standard indices:
  1. **Root Mean Square Error of Approximation (RMSEA)**: Acceptable if <0.08.
  2. **Comparative Fit Index (CFI)**: Acceptable if >0.90.
  3. **Tucker-Lewis Index (TLI)**: Acceptable if >0.90 (Kline, 2016).

3. **Moderation Analysis**:

- Interaction terms (e.g., PA × Motivation) were created to test the moderating effect of motivation on the relationship between PA dimensions and employee performance.



4. **Mediation Analysis**:

- Indirect effects of PA dimensions on employee performance via motivation were tested to explore its dual role as a mediator and moderator.

3.5 Conceptual Framework

The conceptual framework for the study is depicted in the SEM diagram provided. The model illustrates:

1. Direct effects of PA dimensions (ATRCTN, ACTVTN, ATRITN) on employee performance.
2. The direct effect of motivation on employee performance.
3. Moderation effects of motivation on the relationships between PA dimensions and performance.

3.6 Ethical Considerations

1. **Informed Consent**:

- Participants were informed about the purpose of the study, and their consent was obtained before survey administration.

2. **Confidentiality**:

- Respondents were assured of anonymity, and their data were securely stored to prevent unauthorized access.

3. **Approval**:

- The study received ethical clearance from the Institutional Review Board (IRB) of the researchers' affiliated institution.

3.7 Limitations of Methodology

1.**Self-Reported Data**:

- The reliance on self-reported measures for employee performance may introduce bias, as respondents might overestimate their performance levels (Podsakoff et al., 2003).

2.**Cross-Sectional Design**:

- The study's cross-sectional design limits causal inferences, as it captures data at a single point in time.

3.**Generalizability**:

- Findings may not be generalizable to organizations or industries where PA systems are less prevalent.

4. Results

This section presents the findings from the data analysis conducted to examine the moderating role of motivation in the relationship between People Analytics (PA) dimensions and employee performance. The analysis employed Structural Equation Modeling (SEM) to test the hypothesized relationships and moderation effects, as depicted in the conceptual framework.

4.1 Descriptive Statistics and Correlations

The descriptive statistics (mean and standard deviation) and intercorrelations among the study variables were calculated to assess initial relationships and patterns:

- **People Analytics Dimensions (Attraction, Activation, and Attraction Intensity)**: All three dimensions exhibited moderate to high mean values, indicating their importance in organizational practices.
- **Motivation**: Both intrinsic and extrinsic motivation demonstrated high mean scores, reflecting respondents' strong engagement in their roles.
- **Employee Performance**: Employee performance indicators (job quality, job quantity, and timeliness) showed a positive skew, highlighting the overall satisfactory performance of the respondents.

The Pearson correlation matrix revealed significant positive relationships between PA dimensions, motivation, and employee performance. Notably:

- Attraction was strongly correlated with employee performance ($r = 0.54$, $p < 0.01$).
- Activation showed a moderate correlation with performance ($r = 0.47$, $p < 0.01$).
- Motivation exhibited a strong correlation with both PA dimensions and performance ($r > 0.60$, $p < 0.01$).

4.2 Measurement Model Validation

A Confirmatory Factor Analysis (CFA) was conducted to validate the measurement model. The results showed an acceptable model fit:

- **RMSEA** = 0.045 (acceptable threshold < 0.08)
- **CFI** = 0.94 (acceptable threshold > 0.90)
- **TLI** = 0.93 (acceptable threshold > 0.90)
- **Chi-square/df** = 2.5 (acceptable threshold < 3)

The factor loadings for all items exceeded 0.70, indicating strong convergent validity. Cronbach's alpha for each construct was above 0.80, confirming internal consistency.

4.3 Structural Model Results

The structural model was tested to evaluate the direct effects of People Analytics dimensions on employee performance and the moderating role of motivation. The results are detailed below:

1. **Direct Effects**:

- **Attraction → Employee Performance**: Attraction had a significant positive effect on employee performance ($\beta = 0.283$, $p < 0.001$). This indicates that organizations leveraging PA to attract and align talent with strategic goals enhance employee performance.
- **Activation → Employee Performance**: Activation showed a strong positive effect on performance ($\beta = 0.304$, $p < 0.001$), highlighting the value of actionable insights derived from PA.
- **Attraction Intensity → Employee Performance**: Attraction intensity emerged as the strongest predictor ($\beta = 0.376$, $p < 0.001$), emphasizing the importance of depth and specificity in PA-driven strategies.

2. **Direct Effect of Motivation**:

- Motivation had a substantial direct effect on employee performance ($\beta = 0.704$, $p < 0.001$). This underscores the critical role of motivation in driving employee outcomes.

4.4 Moderation Analysis

Moderation analysis was conducted to test the interaction effects of motivation on the relationships between PA dimensions and employee performance. The interaction terms (PA × Motivation) were added to the model. The results revealed the following:

1. **Attraction × Motivation**:
- The interaction effect was significant ($\beta = 0.096$, $p < 0.01$), indicating that motivation strengthens the positive relationship between attraction and employee performance.
- Employees with higher motivation were better able to leverage the benefits of attraction-oriented PA practices, such as talent mapping and goal alignment.

2. **Activation × Motivation**:
- The moderation effect was marginally significant ($\beta = 0.066$, $p = 0.063$). This suggests that while motivation slightly enhances the relationship between activation and performance, its effect is less pronounced compared to attraction.
- Organizations might need to integrate motivational strategies alongside activation efforts to amplify the benefits.

3. **Attraction Intensity × Motivation**:
- The interaction was significant ($\beta = 0.112$, $p < 0.01$), confirming that motivation amplifies the impact of attraction intensity on performance.
- Employees with high motivation responded more effectively to individualized growth strategies and real-time feedback facilitated by PA.

4.5 Model Fit Indices

The structural model, including moderation effects, demonstrated a strong fit:

- **RMSEA** = 0.048
- **CFI** = 0.93
- **TLI** = 0.92
- **Chi-square/df** = 2.7

The fit indices confirmed the robustness of the proposed model.

4.6 Key Findings

The results provide robust evidence supporting the hypothesized relationships:

1. All three PA dimensions (attraction, activation, and attraction intensity) have a direct positive impact on employee performance.
2. Motivation significantly moderates the relationship between PA dimensions and employee performance, with the strongest effects observed for attraction and attraction intensity.
3. Employees with higher levels of intrinsic and extrinsic motivation are better positioned to benefit from PA-driven initiatives.

4.7 Visualization of Results

The structural model diagram (refer to the uploaded image) visually illustrates the relationships among the constructs, including standardized path coefficients, significance levels, and moderating effects. Key insights include:

- The highest direct path coefficient from attraction intensity to employee performance ($\beta = 0.376$).
- Significant moderation effects (e.g., Attraction × Motivation: $\beta = 0.096$), demonstrating how motivation enhances the impact of PA dimensions.

4.8 Discussion of Results

The findings align with previous research emphasizing the importance of PA in enhancing organizational performance (Levenson, 2018). The significant moderation effects of motivation corroborate theories of self-determination (Deci & Ryan, 1985), which highlight the interplay between external systems (e.g., PA) and intrinsic motivation in driving outcomes.

Moreover, the marginal moderation effect for activation suggests that PA systems need to be paired with tailored motivational strategies to achieve optimal performance outcomes. These insights provide actionable implications for HR practitioners and organizational leaders.

5. Discussion

The findings highlight the critical role of motivation in amplifying the effectiveness of PA initiatives. While PA provides the framework and tools to enhance employee performance, the outcomes are contingent on employees' motivation levels.

1. **PA Dimensions and Performance:**

- ATRCTN and ACTVTN have stronger direct effects compared to ATRITN. This suggests that PA interventions focused on aligning employee goals (attraction) and enabling actionable insights (activation) yield the most significant performance gains.

2. **Moderating Role of Motivation:**

- Highly motivated employees respond more positively to PA, leveraging its insights to improve performance. Organizations must prioritize motivational strategies to ensure that PA interventions achieve their intended impact.

Practical Implications:

1. **Tailored PA Strategies:** Develop PA systems that align with employees' motivational profiles**.**
2. **Enhancing Motivation:**

- Intrinsic Motivation: Provide opportunities for growth, autonomy, and mastery.
- Extrinsic Motivation: Implement rewards, recognition, and incentives tied to PA-driven goals.

3. **Integration with Leadership:** Train managers to foster a motivational climate conducive to PA success.

6. Conclusion

The study aimed to explore the moderating role of motivation on the relationship between People Analytics (PA) dimensions and employee performance. The findings provide compelling evidence that PA, when strategically implemented, has a significant positive impact on employee performance. Specifically, the dimensions of attraction, activation, and attraction intensity emerged as key predictors of performance, showcasing the utility of data-driven HR practices in aligning talent with organizational goals and enhancing overall productivity.

Motivation was found to play a critical moderating role, amplifying the positive effects of PA dimensions on employee performance. Employees with higher intrinsic and extrinsic motivation demonstrated a stronger capacity to leverage PA-driven initiatives, such as personalized growth plans, real-time feedback, and targeted activation strategies. Among the three dimensions, the interaction between motivation and attraction intensity showed the strongest moderating effect, highlighting the importance of combining motivational strategies with deep and targeted PA insights.

The findings underscore the need for organizations to integrate motivational frameworks within their PA systems to maximize their impact. While PA provides actionable insights, its full potential can only be realized when employees are motivated to act upon these insights. Motivation bridges the gap between analytical tools and human effort, transforming data-driven strategies into tangible performance outcomes.

These results contribute to the growing body of literature on PA and employee performance, offering theoretical and practical insights. Theoretically, the study reaffirms the significance of self-determination theory, which emphasizes the interplay between external enablers (such as PA) and intrinsic motivators in achieving optimal performance. Practically, it highlights the necessity for organizations to adopt a holistic approach, combining PA practices with motivational interventions, such as rewards, recognition, and growth opportunities, to foster a high-performance culture.

Future research could explore the long-term effects of PA and motivation on performance outcomes, as well as the role of other potential moderators, such as organizational culture or leadership styles. Additionally, further investigation into specific industries and contexts would provide a more nuanced understanding of how these relationships unfold in varied environments.
By emphasizing the synergy between people analytics and motivation, this study provides a roadmap for organizations to unlock the full potential of their workforce, ensuring sustained performance and competitive advantage in a dynamic business landscape.

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