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WHAT MAKES EMPLOYEES ENGAGED? COMPARING THE EFFECTS OF SIX JOB RESOURCES AND THEIR RELATIVE IMPACT ON EMPLOYEE ENGAGEMENT

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Abstract

This cross-sectional study explores how six job resources relate to employee engagement among 310 participants across different demographics. The study contributes to the existing literature by combining multiple resources into one cohesive model, responding to recent demands for identifying the most influential predictors to engage employees. The findings reveal that job variety, colleague support, and development opportunities boost engagement, with development opportunities being the most important. Additionally, older generations demonstrate higher engagement levels than younger employees. The results implicate that organizations should enrich jobs with variety, peer support, and growth opportunities and tailor intervention strategies for a diverse workforce.

Keywords: employee engagement, job resources, job variety, colleague support, development opportunities, structural equation modelling, relative weights analysis

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List of Abbreviations

AVE	Average Variance Extracted
CA	Cronbach's Alpha
CR	Composite Reliability
CS	Colleague Support (only in figures and tables)
DO	Development Opportunities (only in figures and tables)
EE	Employee Engagement (only in figures and tables)
HTMT	Heterotrait-Monotrait Ratio of the Correlations
JA	Job Autonomy (only in figures and tables)
JV	Job Variety (only in figures and tables)
MAE	Mean Absolute Error
PLS-SEM	Partial Least Squares Structural Equation Modelling
RM	Remuneration (only in figures and tables)
RMSE	Root Mean Square Error
TC	Team Climate (only in figures and tables)
VIF	Variance Inflation Factor

1 Introduction

People spend about one-third of their life at work over a lifetime (Gettysburg College 2023). Work can trigger stress, dissatisfaction, and burnout, but it can also provide satisfaction and fulfillment (Prada-Ospina 2019). Over the past decades, scholars have increasingly focused on constructs related to workplace behavior, such as organizational commitment, organizational citizen behavior, and employee engagement (Bailey et al. 2015; Schaufeli et al. 2002; Saks 2006). Schaufeli et al. (2002) describe engagement as employees feeling energetic, committed, and focused on their workplace. The concept relates to various positive downstream outcomes, such as higher individual job satisfaction, lower turnover intentions, and better organizational performance (Schneider et al. 2017).

The current significance of employee engagement is emphasized by low engagement levels across the world. The global average of employee engagement was about 23% in 2022 (Gallup 2023). The situation is more critical in Europe, as engagement levels are at only 14% (Gallup 2023). Low levels of employee engagement cost the global economy approximately 8.8 trillion USD annually, nearly 9% of global GDP (Gallup 2023). These figures highlight the severe economic magnitude that low engagement can have. Hence, employee engagement has emerged as a critical global issue with great economic significance and the need for effective alteration strategies (Bakker and Albrecht 2018).

Therefore, organizations have identified employee engagement as a crucial determinant for success, and its benefits have led scholars to empirically test the drivers of engagement (e.g., Bakker and Demerouti 2008; Crawford, LePine, and Rich 2010; Halbesleben 2010). Many studies have found various antecedents that positively relate to engagement, such as psychological states, leadership and management, or job resources (Bailey et al. 2015). However, studies on job resources frequently focus on a relatively limited range of resources or have not been empirically proven (Bailey et al. 2015; Saks 2019). Hence, there is a lack of quantitative research comparing and contrasting the nature and strength of relationships between various job resources and employees' engagement levels (Bailey et al. 2015).

Understanding the comparative salience of antecedents that are most likely to enhance engagement helps researchers develop better recommendations for interventions due to a more nuanced understanding of the relative importance of factors associated with engagement (Guest 2014). Hence, this study aims to methodically analyze how a range of job resources — job

autonomy, job variety, colleague support, team climate, remuneration, and development opportunities – relate to employee engagement. The selection of these job resources was informed by a recent call to contrast more established elements from Hackman and Oldham's (1985) Job Characteristics Model, such as job autonomy and variety, against both traditional resources including team climate and remuneration, and more novel resources colleague, such as support and development opportunities. This comparison aims to integrate more resources into empirical models where they have been largely absent (Saks 2006, 2019).

Hence, the study seeks to bridge the gap between job resources and engagement by building a comprehensive model that identifies the most impactful resources for engagement and answering the research question of "What are the fundamental job resources that exert the most significant influence on employee engagement?". This query is particularly crucial in the evolving European work environment, where traditional models of employee motivation continue to be challenged and redefined (Albrecht, Green, and Marty 2021; Saks 2019).

The contributions of this study are manifold. Theoretically, the paper enriches the current literature on employee engagement by responding to a call to contrast how a range of job resources influences engagement levels (Bailey et al. 2015; Guest 2014; Saks 2019). The study provides a theoretically grounded framework for organizations to measure and achieve sustainable employee engagement by providing the most suitable resources. Such research also enables the development of more sophisticated recommendations for practitioners based on a deeper understanding of the factors associated with engagement (Bailey et al. 2015). Hence, the findings of this study can potentially guide leaders and organizations in formulating targeted strategies to boost employee engagement, thereby addressing low engagement levels, and enhancing overall organizational effectiveness (Gallup 2023; Schneider et al. 2017).

2 Theoretical Background & Hypothesis Development

This theoretical background reviews previous literature on employee engagement and its relation to job resources, forming a theoretical foundation for the following analysis. First, the review examines underlying conceptual engagement frameworks. Subsequently, the review methodically assesses how each job resource — job autonomy, job variety, colleague support, team climate, remuneration, and development opportunities — relates and potentially contributes to engagement, thereby establishing the necessary hypotheses for the study's model.

2.1 Employee Engagement

Employee engagement is a complex concept with multiple definitions and conceptualizations proposed by prominent scholars (Albrecht, Green, and Marty 2021; Saks 2019). Hence, in the realm of employee engagement research, scholars and practitioners lack unanimity regarding its precise definition and measurement (Albrecht et al. 2015). Kahn (1990) was the first to propose the construct of employee engagement and has since received extensive theoretical and empirical attention (Alfes et al. 2013). He conceptualizes engagement as the psychological experience of work and believes three psychological antecedents are necessary for employees to engage (Kahn 1990). Hence, Kahn (1990) defines *engagement* as "the harnessing of organization members' selves to their work roles" (Kahn 1990, 64). In other words, Kahn (1990) argues that engagement means a person devotes their complete selves to their job by using all their physical, cognitive, and emotional resources (Saks 2006).

The three psychological conditions necessary for an employee to engage are psychological meaningfulness, psychological safety, and psychological availability (Albrecht et al. 2015; Banihani, Lewis, and Syed 2013). Psychological meaningfulness refers to the sense of being rewarded for investing energy (Banihani, Lewis, and Syed 2013). Psychological safety happens when people feel comfortable being themselves without fearing negative consequences (Banihani, Lewis, and Syed 2013). Psychological availability is having the necessary resources to engage effectively (Banihani, Lewis, and Syed 2013; Kahn 1990). Therefore, Kahn (1990) believes people are engaged when they find their work rewarding, can be themselves without being judged, and have the necessary resources to perform well (May, Gilson, and Harter 2004).

Kahn's (1990) theory has received support from empirical studies by May, Gilson, and Harter (2004) and Rich, LePine, and Crawford (2010), which confirm that psychological meaningfulness, safety, and availability positively link to engagement (Banihani, Lewis, and Syed 2013; Saks 2006). Their studies also suggest that Kahn's theory provides a good foundation for understanding how engagement links to a person's psychological conditions and resources at work. Hence, many scholars have used Kahn's (1990) framework to explore aspects of employee engagement and its antecedents (e.g., Bakker et al. 2008; Christian, Garza, and Slaughter 2011; Rothbard 2001; Saks 2006).

However, some scholars argue Kahn's (1990) theory outlines the psychological conditions or antecedents necessary for engagement but fails to explain why employees respond to the same psychological conditions with different degrees of engagement (Saks 2006). Bailey et al. (2015)

also note that more and more scholars have diverged from Kahn's (1990) theory as there may be factors additional to the psychological conditions that influence employee engagement.

Another early stream of engagement research originates from burnout theory (e.g., Demerouti et al. 2001; Maslach, Schaufeli, and Leiter 2001; Schaufeli and Bakker 2004), which characterizes engagement as the opposite of burnout (Maslach, Schaufeli, and Leiter 2001; Saks 2006). Research shows that burnout and engagement overlap on some common components, and both depend on the availability of resources as antecedents (Bakker, Van Emmerik, and Euwema 2006; Schaufeli and Bakker 2004). However, burnout is a negative psychological state that leads to resource loss, while engagement is a positive psychological state that leads to motivation (Schaufeli and Salanova 2011; Schaufeli and Taris 2005). Therefore, employees with low burnout may not always have high engagement, and vice versa (Schaufeli et al. 2002). Fundamentally, the two constructs are imperfect opposites, and since burnout literature cannot fully explain the concept, engagement should be assessed independently (Schaufeli et al. 2002).

Consequently, Schaufeli et al. (2002) provide another definition based on the affective-motivational aspects of engagement and describe it as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli et al. 2002, 71). Their three-dimensional definition underscores that an engaged employee needs enough energy to work hard (vigor), finds their work significant (dedication), and manages to fully concentrate at work (absorption) (Bakker et al. 2008; Hakanen, Bakker, and Schaufeli 2006; Salanova, Nieto, and Peíró 2005; Schaufeli et al. 2002). Hence, these three aspects of engagement interact with each other and influence how an employee engages at work (Schaufeli et al. 2002).

Unlike other definitions of engagement that focus on more specific psychological states (e.g., Kahn 1990), this definition captures a more general and lasting state of mind that varies depending on multiple factors and interactions (Saks 2006; Schaufeli et al. 2002). Schaufeli et al.'s (2002) definition has also received support from many studies that outline how vigor, dedication, and absorption relate to engagement (e.g., González-Roma et al. 2006) and to further downstream positive outcomes such as job satisfaction (Al-Dalahmeh et al. 2018), performance (Bakker and Bal 2010), and commitment (Hakanen, Bakker, and Schaufeli 2006).

2.2 Job Resources

From exploring the employee engagement theories, the focus now shifts to a critical antecedent: job resources. The definitions and conceptual frameworks of employee engagement have been analyzed, highlighting the significant role of an employee's work environment in shaping their

level of engagement. In this chapter, a deeper understanding of the dynamics between job resources and employee engagement will be pursued. Exploring the theories around job resources is fundamental to the study to offer a comprehensive perspective on how job resources may impact employee engagement and hence provide insights essential for developing practical organizational strategies.

Several empirical studies have previously analyzed a multitude of job resources in connection with commitment, motivation, and also engagement (e.g., Bakker and Demerouti 2007; Christian, Garza, and Slaughter 2011; Crawford, LePine, and Rich 2010; Halbesleben 2010). Job resources are work environment factors that positively impact employee engagement and stand out as one of engagement's prominent antecedents (Christian, Garza, and Slaughter 2011; Halbesleben 2010, Schaufeli and Bakker 2004), along with other antecedents such as individual psychological states (e.g., Del Libano et al. 2012; Heuven et al. 2006; Xanthopoulou et al. 2009), leadership and management (e.g., Bakker, Albrecht, and Leiter 2011; Christian, Garza, and Slaughter 2011; Karatepe 2012), and individual perceptions of organizational (e.g., Alfes et al. 2013; Rich, LePine, and Crawford 2010) and team factors (Bailey et al. 2015; Bakker, Van Emmerik, and Euwema 2006). In essence, job resources are individual, social, or organizational aspects of the work environment that help employees better achieve their work objectives, buffer the adverse effects of job demands, and achieve personal development (Bakker and Demerouti 2007; Crawford, LePine, and Rich 2010; Demerouti et al. 2001; Mengüç et al. 2013; Salanova, Nieto, and Peíró 2005; Schaufeli and Bakker 2004).

Job resources can impact employee engagement by fulfilling an extrinsic and an intrinsic motivational role (Bakker and Demerouti 2007; Christian, Garza, and Slaughter 2011). Extrinsic motivation is the external reward that employees obtain from their work, such as remuneration, recognition, or feedback (Hakanen, Bakker, and Schaufeli 2006). Intrinsic motivation is the internal satisfaction of basic psychological needs that employees receive from their work, such as autonomy, competence, or relatedness (Bakker and Demerouti 2007; Schaufeli and Bakker 2004; Van den Broeck et al. 2008; Hackman and Oldham 1975). Job resources can boost both types of motivation by enabling employees to reach their goals and satisfy their needs (Bakker and Albrecht 2018; Bakker and Demerouti 2007; Schaufeli and Bakker 2004). For example, employees who draw upon job resources may become extrinsically and intrinsically motivated as the resources increase the likelihood of managing to attain work objectives or satisfy basic human needs (Bakker and Bal 2010; Van den Broeck et al. 2008). Thus, employees are more vigorous, dedicated, and absorbed, and, engaged in their work

(Bakker, Van Emmerik, and Euwema 2006; Hakanen, Bakker, and Schaufeli 2006; Schaufeli and Bakker 2004).

There are several types of job resources, such as organizational (e.g., remuneration, development opportunities, job security), social (e.g., team climate, supervisor support, peer support), and individual (e.g., skill variety, task identity, task significance, autonomy, feedback) (Bakker and Demerouti 2007). Throughout the past decades, scholars have discovered relationships across the various types of resources (Crawford, LePine, and Rich 2010), but they emphasize that some job resources may encourage employee engagement more than others (Albrecht, Green, and Marty 2021). Yet, the relative importance of different job resources for employee engagement, and the conditions that impact their effects, are unclear (Albrecht, Green, and Marty 2021; Saks and Gruman 2014). Identifying the most relevant job resources for employee engagement is therefore crucial to design and implement intervention strategies that can alter employee engagement and its outcomes (Albrecht et al. 2015; Saks and Gruman 2014). With the ongoing debate in academia and the practical implications for organizations on the significance of various resources, the fundamental research question emerges: "What are the fundamental job resources that exert the most significant influence on employee engagement?" Pointing out such pivotal resources is relevant for designing and implementing intervention strategies to boost engagement and its related benefits (Albrecht et al. 2015; Saks and Gruman 2014). The following six chapters (2.2 to 2.7) discuss each job resource selected for this study's model and their potential to relate to employee engagement.

2.2 Job Autonomy

Job autonomy refers to the degree of freedom and independence an employee has in organizing and executing their job (Bailey et al. 2015; Hackman and Oldham 1975). In other words, autonomy is how much an employee feels they can self-determine which tasks to perform and how to plan, assign, and perform their job (Mengüç et al. 2013; Orth and Volmer 2017; Sims, Szilagyi, and Keller 1976). Autonomy can be among the most important job characteristics for employee engagement for two main reasons.

First, autonomy empowers employees to manage their workflow, enabling them to tailor work processes to their strengths and preferences (De Spiegelaere et al. 2015; Spreitzer 1995). This personalization of work methods allows employees to align their actions more closely with their authentic selves, rather than only reacting to directives from others (Martela and Riekki 2018). Such empowerment can lead to higher mental, emotional, and physical investment in their work

(Kahn 1990), fostering a deeper sense of responsibility, satisfaction, and commitment (Garrido, Pérez, and Antón 2005; DeVaro, Li, and Brookshire 2007; Noblet et al. 2005). The ability to make independent decisions and take responsibility for outcomes can activate a sense of agency in employees, which can be a crucial component in boosting engagement (Shantz et al. 2013; Hackman and Oldham 1976).

Second, job autonomy links to internal motivation (Deci and Ryan 1985). Giving employees control over their work and decisions can motivate them intrinsically, offering a sense of psychological freedom (Schaufeli and Bakker 2004; Van den Broeck et al. 2008). This freedom can translate into higher engagement, as employees feel more connected and invested in their work due to the autonomy they experience (Van den Broeck et al. 2008). Hence, job autonomy is selected as one of the central focuses in this study, due to its potential to create more engaged employees. Hence, the study analyses the extent to which autonomy influences employee engagement and weighs its importance in the broader context of job resources. That leads to the first hypothesis:

Hypothesis 1*: Job autonomy positively relates to employee engagement (1a), suggesting that autonomy plays a more important role in fostering employee engagement compared to other job resources (1b).*

2.3 Job Variety

Since the study moves deeper into the antecedents of employee engagement, it becomes crucial to examine another job characteristic: job variety (Hackman and Oldham 1975; Guest 2014; Macey and Schneider 2008). *Job variety* denotes the extent to which a job requires an employee to engage in various tasks involving different skills and activities (Hackman and Oldham 1975; Sims, Szilagyi, and Keller 1976).

Several studies (e.g., Hakanen, Bakker, and Demerouti 2005; Salanova and Schaufeli 2008) and meta-analyses (e.g., Christian, Garza, and Slaughter 2011; Crawford, LePine, and Rich 2010) have already shown that job variety is a critical determinant of how employees perceive and interact in their work environment. These studies also suggest that diverse tasks can make employees feel enthusiasm, dedication, and meaningfulness in work (Albrecht, Green, and Marty 2021; Guest 2014; Hackman and Oldham 1975; Shantz et al. 2013). Conversely, jobs lacking variety relate to psychological distress and disengagement (Kahn 1990; Melamed et al. 1995). That connection is rooted in people's psychological need for relatedness and competence (Deci and Ryan 2000). Employees with a variety of tasks activate an internal motivational

process that boosts their interest and energy toward their job, which may increase engagement (Morgeson and Humphrey 2006; Deci and Ryan 2000; Schaufeli and Bakker 2004).

Hence, the following hypothesis centers on job variety having a fundamental role in boosting employee engagement, potentially more so than other job resources. One reason for that assumption is that organizations that extend variety in their jobs already show evidence for better performance and work outcomes (Shantz et al. 2013). Therefore, the hypothesis aims to extend the understanding of how important job variety is for employee engagement. Hence, the following is hypothesized:

Hypothesis 2*: Job variety positively relates to employee engagement (2a), and the presence of variety in jobs plays a more important role in enhancing employee engagement compared to other job resources (2b).*

2.4 Colleague Support

This theoretical breakdown also assesses the role of support in engaging employees for a better understanding of the dynamics of employee engagement (Peccei 2013). Various studies have previously demonstrated how a supportive work environment can give employees a sense of belonging and psychological safety (May, Gilson, and Harter 2004; Xanthopoulou et al. 2008). That, in turn, can serve as an extrinsic motivator for achieving work goals and an intrinsic motivator for personal development (Schaufeli and Bakker 2004; Demerouti et al. 2001).

Social support is subdivided into two types: supervisor and colleague support (Mengüç et al. 2013). Supervisor support is the degree to which superiors value the contributions of their subordinates, care for their well-being, and provide them with resources and guidance (Eisenberger et al. 2013). While earlier research has highlighted supervisor support as a vital determinant of employee engagement (e.g., Crawford, LePine, and Rich 2010), recent studies (e.g., Albrecht, Green, and Marty 2021; Mengüç et al. 2013) suggest a diminishing influence of this factor on engagement levels. This decline may be because employees could perceive supervisor support as a transactional duty influenced by hierarchical structures rather than a genuine and meaningful interpersonal connection (Albrecht, Green, and Marty 2021).

This directs the focus to colleague support, often perceived as more authentic and conducive to employees finding deeper purpose and meaning in their work (Albrecht, Green, and Marty 2021). Colleague support denotes the assistance and encouragement shared among peers within the workplace (Martin 2010). Studies show that colleague support fosters open communication,

mutual understanding, and trust among co-workers, factors that are instrumental in lowering stress and enhancing job satisfaction (Adriaenssens et al. 2011; Sawang 2012).

Colleague support may be among the most important job resources for two reasons (Schaufeli and Bakker 2004; Halbesleben 2010). First, it relates to higher self-efficacy, as employees in a supportive network feel more capable and resourceful to do their jobs successfully (Xanthopoulou et al. 2008). Second, supportive colleagues help create a psychologically safe environment, enabling employees to invest more energy, dedication, and focus (May, Gilson, and Harter 2004), which could lead to higher engagement (Schaufeli and Bakker 2004). Hence, colleague support is likely to impact employee engagement more profoundly than other job resources, leading to the third hypothesis:

Hypothesis 3*: Colleague support positively relates to employee engagement (3a), suggesting that it plays a more important role in fostering employee engagement compared to other job resources (3b).*

2.5 Team Climate

Besides social support from supervisors and colleagues, team climate stands out as another prominent interpersonal job resource shaping individual behavior within the workplace (Xue, Bradley, and Liang 2011). Team climate is employees' shared perceptions of their work environment and interactions, directly influencing their ability to cooperate (Anderson and West 1998). In other words, team climate is how employees view and experience their work environment, shaping their actions and outcomes.

The potential impact of team climate on employee engagement has multiple aspects (Hakanen, Bakker, and Schaufeli 2006). First, a supportive team climate promotes rewarding interactions within a team, which can boost engagement levels (Kahn 1990; Christian, Garza, and Slaughter 2011). Research shows that employees are more encouraged to communicate their optimism, positive attitudes, and proactive behaviors to their colleagues in a positive team environment (Bakker, Van Emmerik, and Euwema 2006). Furthermore, team climate promotes psychological safety and encourages employees to express themselves and take risks without fearing negative consequences (Edmondson 1999). This sense of safety can motivate employees internally to engage (Hackman 1980). A positive team climate also promotes several individual work behaviors, such as knowledge sharing (Xue, Bradley, and Liang 2011), creativity (Amabile et al. 1996), and performance levels (Torrente et al. 2012).

Therefore, team climate may be stronger related to employee engagement than other job resources. Various empirical studies (e.g., Salanova, Nieto, and Peíró 2005; Bakker and Demerouti 2007) have consistently underscored the unique impact of team climate on fostering a positive work environment. Hence, team climate may be more relevant than traditional job characteristics such as financial incentives or individual-level support. Team climate, with its emphasis on collective perceptions and shared experiences, may promote employee engagement but also add to a more resilient work culture (Schaufeli and Bakker 2004; May, Gilson, and Harter 2004). Given the variable's comprehensive effects on the work environment, the fourth hypothesis is:

Hypothesis 4: *Team climate positively relates to employee engagement (4a), suggesting that it plays a more important role in fostering employee engagement compared to other job resources (4b).*

2.6 Remuneration

This chapter delves into the dynamics of financial rewards, specifically remuneration, as a potential driver in the overall dynamics of job resources and employee engagement. Remuneration refers to an employee's total compensation for their services, including fixed salary, bonuses, and other financial benefits (Schlechter et al. 2014).

In the employee engagement literature, financial factors are known as crucial job attributes and among the most effective attraction and retention metrics (Boswell et al. 2003). Remuneration reflects an organization's recognition of an employee's skills, efforts, and contributions, and therefore relates to such positive organizational behavior (Bailey et al. 2015; Saks 2006). The level of remuneration also serves as a means of meeting fundamental human needs by ensuring nutrition, clothing, and housing (Hu and Schaufeli 2011; Maslow 1943) as well as basic needs for status, achievement, and recognition (Hu and Schaufeli 2011). Beyond these basics, remuneration can also foster personal growth and development by allowing employees to afford the resources to access information and opportunities (Hu and Schaufeli 2011), providing employees with higher job security (Clark 2005).

Job design research has therefore consistently acknowledged the role of remuneration (Schlechter et al. 2014). Adequate remuneration enhances the sense of return on investment for employees (Saks 2006). This perception is not just about the financial return but also relates to employees' psychological and emotional investments in their jobs (Hu and Schaufeli 2011). When employees feel adequately compensated, they become intrinsically motivated and,

potentially, more engaged (Schlechter et al. 2014). Furthermore, Maslach, Schaufeli, and Leiter (2001) assert that remuneration is vital in cultivating a positive work environment. It fosters a sense of fairness and equity, additional essential factors for employee engagement and organizational commitment (Schlechter et al. 2014). Employees who believe their remuneration is fair and reflective of their work may be more likely to engage and commit to their organization (Maslach, Schaufeli, and Leiter 2001).

Remuneration emerges as a potentially crucial factor for employee engagement due to its vital role in addressing fundamental needs, promoting a sense of value and equity, and contributing to higher levels of intrinsic motivation. Hence, it is vital to empirically assess how remuneration, as a core component of financial rewards, compares to other job resources in influencing employee engagement. Therefore, the following hypothesis is proposed:

Hypothesis 5*: Remuneration positively relates to employee engagement (5a), suggesting that it plays a more important role in fostering employee engagement compared to other job resources (5b).*

2.7 Development Opportunities

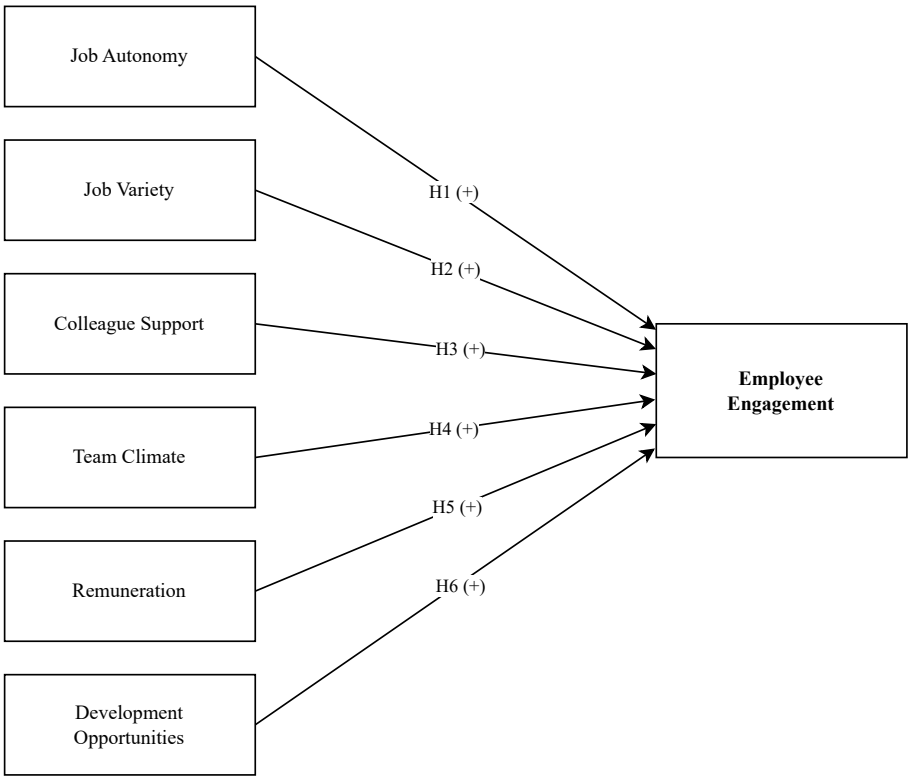
Opportunities for professional development have increasingly been recognized as a pivotal job design factor (Xanthopoulou et al. 2007; Schaufeli et al. 2009; Bakker and Bal 2010). Development opportunities are critical job resources for achieving work objectives, fostering personal growth, and promoting continuous learning and development (Bakker and Demerouti 2007; Idris and Dollard 2011). Development opportunities range from formal training courses to on-the-job activities that empower employees to learn new skills and acquire new competencies, thereby, enabling them to execute tasks with more efficacy (Bailey et al. 2015). This enhancement is not just about doing tasks but about creating a sense of control over job responsibilities, boosting career progression, and personal fulfillment (Idris and Dollard 2011).

Development opportunities are chosen for this study as they give employees a sense of value and significance within their organization (Kwon and Kim 2020; Xanthopoulou et al. 2007). This perceived value translates into higher feelings of efficacy, meaningfulness, and optimism – factors that relate to engagement (Xanthopoulou et al. 2007). Additionally, development opportunities meet the fundamental psychological needs of autonomy, relatedness, and competence (Bakker and Xanthopoulou 2013; Van den Broeck et al. 2008), contributing to personal growth, well-being (Deci and Ryan 1985), self-efficacy, and resilience (Bakker and

Xanthopoulou 2013). In light of this analysis, development opportunities may enhance employee engagement and surpass other job resources. The following hypothesis is proposed:

Hypothesis 6*: Development opportunities positively relate to employee engagement (6a), suggesting that they play a more important role in fostering employee engagement compared to other job resources (6b).*

Figure 1:
Hypothesized Model



3 Methodology

3.1 Participants and Procedure

Data Collection

Data was collected with a cross-sectional approach including a self-administered web survey. The survey tool *Qualtrics* was used to develop the questionnaire. Before data collection, pilot research was conducted among colleagues (N = 10) to determine the feasibility of the survey. The pilot study respondents commented on the survey's technical functioning as well as item and scale comprehensibility, which helped improve several survey items. Survey participants

were recruited through social media platforms, including *Facebook*, *Instagram*, and *WhatsApp*, the social networking platform LinkedIn, and via direct emailing. Additionally, several companies distributed the survey in their intranets to expand the reach and diversity of the participant pool. Completing the survey was estimated to take between six to eight minutes. Data collection took place over two weeks in November 2023. Participants could also take part in a lottery to win a 20 Euro Amazon voucher, since research shows that lottery-based incentives encourage survey participation and raise response rates in online surveys, as suggested by Laguilles, Williams, and Saunders (2010).

Survey Structure

When accessing the survey, an introductory text informed participants about the study's purpose and the anonymity of participation, followed by a privacy statement that participants had to agree to continue with the survey. The survey followed a structured format of three parts, as guided by Krosnick (2017). First, respondents were asked about their current employment status, a requirement for answering questions on their work-related behaviors. Following this, participants had to provide personal information, stating their age, gender, nationality, and educational level. In addition, participants were asked about the specifics of their employment, including the country of employment, contracted weekly work hours, industry sector, and company size. The second part of the questionnaire included 25 questions on participants' views on various job resources. The third part centered on participants' levels of engagement, including nine questions. Table A3 (Appendix A) shows the complete the questionnaire.

Data Cleaning

From the original sample (N = 520), 40 responses were removed as the respondents did not accept the declaration of consent. Furthermore, 216 participants were excluded for completing the survey in less than two minutes, as further review indicated a seemingly random or mechanical response pattern, suggesting a lack of attentiveness while answering the questions. Completing the survey in a very brief time may indicate a lack of thoughtful consideration, potentially lowering the accuracy and reliability of the collected data. Another 21 responses with missing data concerning employee engagement and/or job resources were removed to improve the overall quality of the dataset. Finally, 41 responses were removed for participants who failed to answer the control questions correctly, indicating a lack of attentiveness.

Demographic Overview

The final dataset includes 310 respondents. Participants are aged 18 to 64, with an average age group of 25 to 34 years (Appendix A, Table A2). The dataset reflects that 51% of respondents identify with the gender of men, 48% with women, and three respondents abstained from providing gender information (Appendix A, Table A2). Given that the survey was predominantly shared in Europe, 296 respondents identified as European and 14 as non-European. The data shows that most respondents identified as Italian (38%) followed by Austria (26%), Norway (7%), and Germany (7%) (Appendix A, Table A2). The majority of participants completed a bachelor's degree (41%), followed by participants who have a master's degree (33%), and participants who completed an apprenticeship or specialized secondary school (20%) (Appendix A, Table A2). The survey was released in two languages; 62% of respondents answered in German, while 38% answered in English. Regarding participants' professional backgrounds, the majority of respondents are employed in the consulting industry (17%) followed by finance and banking (13%), and construction (9%) (Appendix A, Table A2). Most participants are employed by large-scale corporations with more than 1,000 employees (30%) and medium-sized enterprises with 50 to 249 employees (28%) (Appendix A, Table A2). On average, respondents' contracts require them to work 38.5 hours per week. The prevailing contractual obligation among participants is a 40-hour workweek (38%), followed by a commitment to 38.5 hours weekly (18%), and a lesser percentage adhering to a 20-hour workweek (7%) (Appendix A, Table A2). Most participants have a standard workweek of 40 hours (38%) or 38.5 hours (18%) per week. A smaller percentage follows a 20-hour workweek (7%) (Appendix A, Table A2).

Translation of Questionnaire

Brislin's (1970) back-translation technique was used for translating the English survey into German, enabling respondents to answer in two languages. The initial items were translated into German using the website *DeepL.com*, and a German professor verified the translations. An English native speaker then translated the German survey items back into English, ensuring the quality of the translation and identifying differences between the original and translated questionnaire (Brislin 1970).

3.2 Measurements

In the current study, participants evaluated the statements on employee engagement and job resources with a five-point Likert scale, expressing agreement or disagreement from 1 (Strongly disagree) to 5 (Strongly agree). The survey only includes previously validated scales. This approach ensures the data collected is reliable and valid, providing a subtle understanding of the attitudes of the respondents, and sustaining a solid data analysis.

Employee Engagement

Employee engagement was measured with the nine-item version of the Utrecht Work Engagement Scale (UWES). The UWES is a common measure of employee engagement that was originally developed by Schaufeli and Bakker (2004) relating to the burnout literature (Bakker, Albrecht, and Leiter 2011; Crawford, LePine, and Rich 2010; Rich, LePine, and Crawford 2010; Saks and Gruman 2014; Schaufeli and Bakker 2010). The original scale consisted of three sub-dimensions (vigor, dedication, absorption) and has been validated in multiple countries and across different cultural contexts (Albrecht, Green, and Marty 2021; Schaufeli, Bakker, and Salanova 2006; Bakker, Albrecht, and Leiter 2011).

However, studies using the original 17-item UWES have shown invariance across countries (Schaufeli et al. 2002) and racial groups (Storm and Rothmann 2003), raising concerns about the universality and transferability of the measure (Schaufeli, Bakker, and Salanova 2006). In response to these concerns, the short 9-item version of the UWES has become more prominent in academic literature (Schaufeli, Bakker, and Salanova 2006). It has been found to have more robust construct validity across different occupational groups and greater time-invariance than the 17-item version (Seppälä et al. 2008).

Hence, the total UWES-9 score is considered a reliable and practical overall measure of employee engagement (Schaufeli, Bakker, and Salanova 2006). The UWES-9 includes three items for each engagement dimension: vigor (e.g., “At my work, I feel bursting with energy”; VI1 to VI3), dedication (e.g., “My job inspires me”; DE1 to DE3), and absorption (e.g., “I get carried away when I am working”; AB1 to AB3) (Appendix A, Table A1). The Cronbach’s alpha value was $\alpha = 0.884$.

Autonomy

Autonomy was measured using three items (AN1 to AN3) adapted from Spreitzer's (1995) empowerment scale, suggested by Albrecht, Green, and Marty (2021). One example is "I can decide myself how I execute my work" (Appendix A, Table A1). The Cronbach's alpha value was $\alpha = 0.742$.

Job Variety

Job variety was assessed with three items adapted from Morgeson and Humphrey's (2006) *Work Design Questionnaire* (WDQ). The WDQ is one of the most comprehensive measures of work design since it combines over 40 years of work design research into one single concise measure (Morgeson and Humphrey 2006). The three items (JV1 to JV3) included, for example, "My job involves the performance of a wide range of tasks" (Appendix A, Table A1). The Cronbach's alpha value equaled $\alpha = 0.808$.

Colleague Support

Colleague support was measured with four items (SS1 to SS4) based on Van Veldhoven and Meijman's (1994) *Questionnaire on the Experience and Evaluation of Work* (QEEW). The items were translated from the Dutch original *Vragenlijst Beleving en Beoordeling van de Arbeid* (VBBA) using Brislin's (1970) back-translation technique together with the website *DeepL.com* and a Dutch native speaker. One example is "I can count on my co-workers when my work becomes challenging" (Dutch original: "Ik kan op mijn collega's rekenen als het moeilijk wordt op het werk.") (Appendix A, Table A1). The Cronbach's alpha is $\alpha = 0.811$.

Team Climate

Team climate was measured using four items (TC1 to TC4) adapted from Anderson and West's (1998) *Team Climate Inventory* (TCI) scale. The original scale, a multi-dimensional measure of work team atmosphere with 61 items, was shortened to create a concise survey (Anderson and West 1998). Based on the factor loadings, four out of 61 items with the highest factor loadings were used for this study. One example is "In my team, I can openly share information with others" (Appendix A, Table A1). The value of the Cronbach's alpha is $\alpha = 0.799$.

Remuneration

Remuneration was scored with four items (RM1 to RM4) based on Hu and Schaufeli's (2011) self-developed scale of current remuneration. An example item is "I believe I receive fair compensation compared to others in my department" (Appendix A, Table A1). Cronbach's alpha value equals $\alpha = 0.818$.

Development Opportunities

Opportunities for professional development was measured using three items (DO1 to DO3) adapted from Bakker et al. (2003). An example item is "I get lots of opportunities to improve my skills at work" (Appendix A, Table A1). The Cronbach's alpha value is $\alpha = 0.861$.

3.3 Sample Size

Several methods are constructive to determine the sample size. Based on the 10-times rule, the minimum sample size should be ten times the number of maximum arrows linking to one variable (Kock and Hadaya 2016). Hence, the lowest number of respondents should be 90, given that nine items helped assess employee engagement. Alternatively, Kyriazos (2018) proposed an a priori sample selection strategy considering statistical power, effect sizes, and the number of variables. Following this approach, Soper (2023) developed an online calculator that suggests a minimum of 52 to 210 responses, depending on the expected effect size (0.3 or 0.5). An alternative method for estimating the sample size after collecting the data is the R-squared method, which relies on the maximum number of arrows associated with a dependent variable and the model's minimum r^2 (Kock and Hadaya 2016). Given that the dependent variable includes nine items and the minimum r^2 is 0.1, the sample should include at least 181 respondents. Hence, 310 responses are considered satisfactory for the model in this paper.

3.4 Data Analysis

This paper used partial least squares structural equation modeling (PLS-SEM) to evaluate the model fit (Chapter 3.5), the structural relationships between the constructs (Chapter 3.6), the direct effects (Chapter 4.1), and the effect sizes of each construct (Chapter 4.2) (Hair et al. 2019). The PLS-SEM method helped identify complex relationships among latent variables in structural analyses (Bashir and Venkatakrishnan 2022). After preparing the data with Microsoft Excel, the PLS-SEM model was created with the SmartPLS Version 4.0.9.7 (Ringle, Wende, and Becker 2022). PLS-SEM is widely used in social science research, including different

management disciplines, and is known for delivering solid analyses for complex models with small sample sizes (Hair et al. 2019). PLS-SEM is also useful for analyzing non-normally distributed data, such as data collected on a five-point Likert scale (Hair et al. 2019). Hence, using PLS-SEM was considered appropriate for this study.

Furthermore, this paper employed a Relative Weight Analysis (RWA) to determine the most relevant job resource influencing employee engagement. RWA has become a prominent statistical methodology in organizational research to accurately determine the relative contribution of multiple predictor variables in regression analysis (Tonidandel and LeBreton 2014). This method allows splitting the total variance predicted in a statistical model (r^2) into weights that outline the proportional contributions of various predictors. Studies show that RWA provides reliable estimates of predictor importance (LeBreton et al. 2004a; LeBreton, Ployhart, and Ladd 2004; LeBreton et al. 2007). Its utility is evident across organizational literature, including studies investigating the most important determinants for turnover (Lopina, Rogelberg, and Howell 2011), organizational commitment (Major, Morganson, and Bolen 2012), and leader derailment (Braddy et al. 2014).

3.5 Assessing Reflective Measurement Models

Before testing the hypotheses, the paper conducted a reflective measurement model assessment to ensure the reliability and validity of the construct measures and provide support for the integration of the constructs in the path model (Hair et al. 2019). The reflective measurement model tests included indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

Indicator Reliability

To guarantee that the construct explains at least 50% of the variance in the indicator, the factor loading for each item should be at least 0.7 (Hair et al. 2019; Hulland 1999). Items with factor loadings above 0.4 are still acceptable but not desirable (Hulland 1999). Items with a factor loading above 0.7 remain in the data set following this recommendation. Items between 0.4 and 0.7 may be kept only for a strong theoretical reason (Hulland 1999). Hence, this was decided for each item separately. The analysis showed that the items EE6, EE7, and EE9 have factor loadings from 0.4 to 0.7; hence, additional tests were necessary (Appendix B, Table B1). Removing the three items resulted in a slight increase in Cronbach's Alpha (CA, now 0.888) and Average Variance Extracted (AVE, now 0.642) for Employee Engagement. The factor

loadings and the other reliability measures for the remaining items and variables hardly changed. Therefore, removing the items EE6, EE7, and EE9 yielded little improvement. Since the factor loadings for all three items are above 0.4, Hulland's (1999) analysis confirms that they can remain in the construct, and no items were taken out. Hence, the final model (Appendix B, Figure B1) shows factor loadings mostly above 0.7.

Internal Consistency

The reliability measures Cronbach's Alpha (CA) and Composite Reliability (CR) from the indicator reliability analysis are useful to analyze the internal consistency of the data (Hair et al. 2019). A CR value between 0.7 and 0.9 is ideal but values above 0.6 are also acceptable. A CR value of 0.95 or higher may indicate error terms, which is not the case for this data set (Hair et al. 2019). The CA applies the same benchmarks as the CR, so the CA and CR are interchangeable (Peterson and Kim 2013). However, Hair et al. (2019) suggest that the CA yields lower and less precise values than CR given the CA is not weighted. Hence, attention was directed towards the CR, which ranges from 0.774 to 0.901 for all constructs (Appendix B, Table B1). That indicates robust internal consistency among the constructs, underlining the reliability of the dataset and the resulting outcomes.

Convergent Validity

Using multiple measures for a single construct can lead to missing convergent validity (Hair et al. 2019). An established method for assessing convergent validity is through the Average Variance Extracted (AVE), which should be greater than 0.5 to demonstrate data validity (Cheung et al. 2023). The model in this study aligns with this criterion as AVE values range between 0.527 and 0.783 (Appendix B, Table B1). That indicates that the measured constructs account for more than 50% of the variances in the indicators (Hair et al. 2019).

Discriminant Validity

The discriminant validity demonstrates how much one construct differs from the other items in the model (Hair et al. 2019). That becomes especially crucial when working with latent variables since it is necessary to look for potential multicollinearity (Ab Hamid et al. 2017). This aspect is essential in this study as it explores six positive and partially overlapping job resources. Three tests, including the Fornell-Larcker criterium, the heterotrait-monotrait ratio of the correlations (HTMT), and the cross-loadings were performed. First, the Fornell-Larcker

criterion demonstrates that all constructs meet the condition for discriminant validity if they are less than 0.9 (Appendix B, Table B2).

Second, the heterotrait-monotrait correlations ratio (HTMT) can replace the first and third tests, the Fornell-Larcker criterion and cross-loadings, as it provides more sensitive results in detecting a lack of discriminant validity (Henseler, Ringle, and Sarstedt 2015; Ab Hamid et al. 2017). The HTMT is defined as "the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct" (Hair et al. 2019, 9) and should be less than 0.9 for conceptually similar models such as the one used in this study (Henseler, Ringle, and Sarstedt 2015). Therefore, the HTMT result was compared to the Fornell-Larcker criterion. The test results outline that numerous job resources are similar, but no value is greater than 0.9 (Appendix B, Table B3).

Third, the cross-loadings test was performed to demonstrate that the constructs are similar. The discriminant validity requires that each item correlates most strongly with the investigated construct and not with any other (Henseler, Ringle, and Sarstedt 2015). The current data set meets this condition (Appendix B, Table B4). Consequently, the highly sensitive HTMT, along with the Fornell-Larcker criterion and cross-loadings, demonstrate that the data meets all requirements, suggesting appropriate discriminant validity.

3.6 Assessing the Structural Model

The reflective measurement model assessments show satisfactory data validity and reliability. Before testing the hypothesis, the second step included assessing the requirements for the structural model, which includes analyzing collinearity, predictive power, and path coefficients. The study performed bootstrapping with 5,000 subsamples, a 5% significance level, and a two-tailed test using SmartPLS4 (Ringle, Wende, and Becker 2022).

Collinearity

Collinearity can be a concern if the predicting variables have an essentially linear connection (Mason and Perreault 1991). Collinearity among the predicted latent constructs must be tested in PLS-SEM models, for instance, with the variance inflation factor (VIF). The VIF should be less than 5 to avoid collinearity issues (Hair et al. 2019). One item in this study has a VIF of 3.054 whilst all other items have VIF levels below 3. That is a good indicator that collinearity is below the critical levels of the formative measurement models and is not a concern for the model estimation (Appendix B, Table B1).

Predictive Power Validation and Path Coefficients

The assessment of the predictive power of the model involves examining the coefficient of determination (R^2), the external validity measure (Q^2), and the Root Mean Square Error (RMSE) / Mean Absolute Error (MAE). First, the R^2 is a strength-of-fit evaluation, measuring the explanatory power of the model by estimating the variance of the response variable explained by the model (Shmueli and Koppius 2011). R^2 values, such as 0.2, 0.25, 0.5, and 0.75, indicate weak, moderate, or strong explanatory power (Hair, Ringle, and Sarstedt 2011).

The six independent variables in this study, all related to job resources, address resources provided to employees, not any external or internal factors that could encourage employee engagement. Hence, the R^2 value for employee engagement (0.455) demonstrates that job resources cannot fully explain employee engagement as the predictive power is moderate (Appendix B, Table B5). Furthermore, the Q^2 value is useful to assess the predictive accuracy of the model, serving as a cross-validated redundancy measure (Hair et al. 2019). This measure was calculated with the PSLpredict method in SmartPLS (Ringle, Wende, and Becker 2022). The Q^2 value should be higher than 0.0, and values below 0.25 show a weak predictive accuracy (Hair et al. 2019). Hence, the Q^2 value of 0.420 indicates a weak to moderate predictive relevance of the model (Appendix B, Table B5).

With the R2 and Q2 values, the in-sample prediction accuracy can be examined but not the out-of-sample predictive power. The latter is more frequently assessed with the root-mean-square error (RMSE). The RMSE, particularly useful for business research, is the square root of the mean squared variances between predicted and observed values (Hair et al. 2019). Initially, it was necessary to ensure that the Q^2*-Predict* values exceed zero, as it outlines that the prediction error of the PLS path model is less than the prediction error provided by the (most) naïve benchmark (Shmueli et al. 2019). That criterion applies to this data set (Appendix B2, Table B5). Depending on the degree of normal distribution, the RMSE or MAE values were then compared to the linear regression model (LM) benchmarks (Shmueli et al. 2019). Summed up, the results outline moderate-to-strong predictive power since all except for one RMSE and MAE values are below their LM benchmark (Appendix B, Table B5) (Shmueli et al. 2019). Hence, all three tests validated the predictive power of the model with varying levels, outlining that the data and structural model were suitable for hypothesis testing.

4 Results

4.1 Descriptive Statistics and Correlations

Table 1 outlines the means and standard deviations of each variable as well as the measures' pairwise linear correlations. The job resources' correlations and collinearity were assessed before and show important distinctions. Evaluating the control variables showed a significant correlation of engagement only with age, nationality, and industry.

Table 1:
Descriptive Statistics and Correlations

	Mean	SD	EE	AN	JV	SS	TC	RM	DO
EE	3.598	0.683							
JA	4.038	0.707	0.34***						
JV	4.258	0.731	0.45***	0.37***					
CS	4.346	0.630	0.43***	0.22***	0.17**				
TC	4.221	0.652	0.38***	0.25***	0.21***	0.66***			
RM	3.321	0.924	0.30***	0.24***	0.13*	0.30***	0.26***		
DO	3.904	0.876	0.57***	0.28***	0.37***	0.44***	0.36***	0.33***	

Note: EE = Employee Engagement, JA = Job Autonomy, JV = Job Variety, CS = Colleague Support, TC = Team Climate, RM = Remuneration, DO = Development Opportunities; All measured on a 5-point Likert scale
P-Value: *** < 0.001; ** < 0.01; * < 0.05

4.2 Analysis of Direct Effects with PLS-SEM

The study hypotheses were assessed by calculating the path coefficients (ß) and their statistical significance levels with the bootstrapping method in SmartPLS, using 5,000 subsamples and a 5% significance level to ensure the results are significant (Hair et al. 2019; Ringle, Wende, and Becker 2022). The path coefficients (ß) determine the direction and strength of the relationships, which range from -1 to +1 and must be analyzed for significance using the p-value levels (0.001, 0.01, 0.05) and t-statistics (>1.96) (Hair, Ringle, and Sarstedt 2011; Hair et al. 2019). This part of the analysis focused on the direct impact of job resources on employee engagement. Table 2 outlines the direct effects of each predictor variable on the response variable (Bollen 1987).

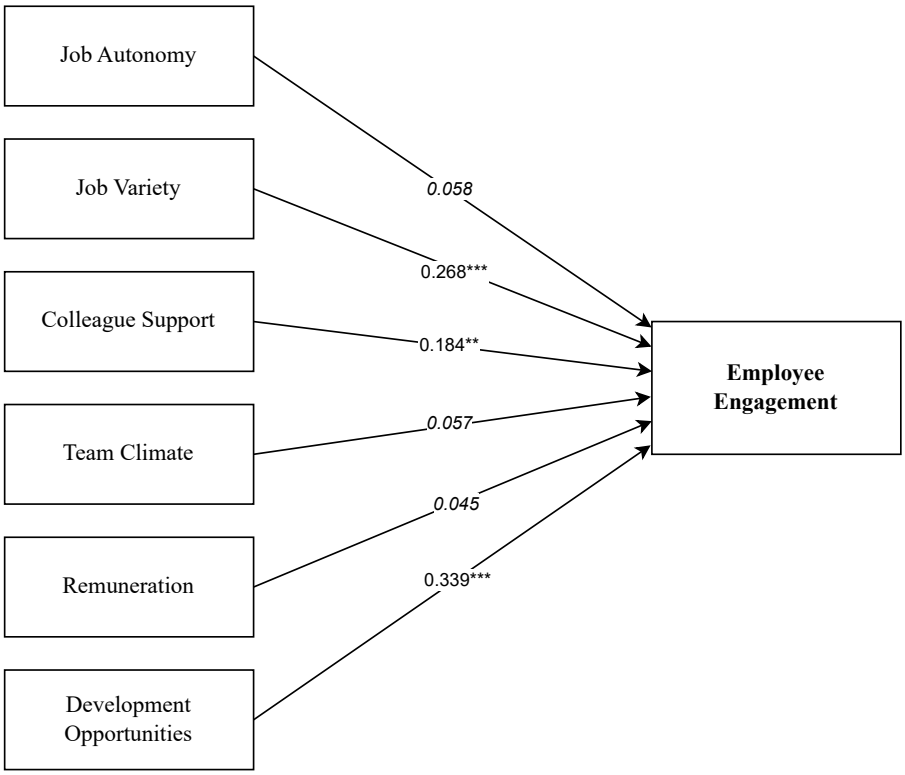
Table 2:
Direct Effects

Job Resource	Hypothesis	Effect	β	T-Statistics	P-Value	Remark
Job Autonomy	H1a	AN → EE	0.058	1.230	0.219	Insignificant
Job Variety	H2a	JV → EE	0.268	5.027	0.000	Significant
Colleague Support	H3a	SS → EE	0.184	3.068	0.002	Significant
Team Climate	H4a	TC → EE	0.057	1.095	0.274	Insignificant
Remuneration	H5a	RM → EE	0.045	0.955	0.340	Insignificant
Development Opportunities	H6a	DO → EE	0.339	5.857	0.000	Significant

Note: β = Path Coefficient; Significant if $p < 0.05$; Insignificant if $p > 0.05$

Hypothesis 1a suggests that job autonomy positively relates to employee engagement. However, the path coefficient (β = 0.058) is insignificant at the 0.05 level (p = 0.219; t = 1.230), so this hypothesis cannot be supported (Table 2). *Hypothesis 2a* outlines that job variety has a positive effect on employee engagement. Hence, the hypothesis can be supported with a path coefficient of 0.268, highly significant at the 0.001 level (p = 0.000, t = 5.027) (Table 2). *Hypothesis 3a* predicts a positive relationship between colleague support and employee engagement. The results show the path coefficient of 0.184 is significant at the 0.01 level (p = 0.002; t = 3.068), and the hypothesis can be supported (Table 2). *Hypothesis 4a* suggests that team climate positively impacts employee engagement. However, the results outline a path coefficient (β = 0.057) insignificant at the 0.05 level (p = 0.274, t = 1.095), and the hypothesis cannot be accepted (Table 2). *Hypothesis 5a* predicts a positive effect of remuneration on employee engagement. However, the path coefficient (β = 0.045) is insignificant at the 0.05 level (p = 0.340, t = 0.955), which is why the hypothesis is not supportable (Table 2). *Hypothesis 6a* states that development opportunities have a positive impact on employee engagement. Therefore, the hypothesis can be supported with a path coefficient of 0.339, highly significant at the 0.001 level (p = 0.000, t = 5.857) (Table 2). When analyzing the direct positive effects of job resources on employee engagement, this study only finds support for job variety, colleague support, and development opportunities as tested in *H2a*, *H3a*, and *H6a* (Figure 2).

Figure 2:
Direct Effects and Significance Levels



Note: *** = p < 0.001; ** = p < 0.01; *cursive* = insignificant

4.3 Analysis of Effect Sizes with PLS-SEM

To better compare the job resources' direct relations, the effect size (F-square) was examined. The effect size (F-square) measures the impact of each external variable on the response variable by quantifying the change in R-square when a predictor variable is removed from the model (Bashir and Venkatakrishnan 2022; Cohen 1988). Cohen (1988) classifies the F-square values as small (≥ 0.02), moderate (≥ 0.15), and large (≥ 0.35) effect sizes. Hence, analyzing the effect size helps understand the relative impact of a job resource on employee engagement.

Figure 3 shows that development opportunities have the greatest effect size ($f^2 = 0.142$). The second greatest effect size is a small positive effect for job variety ($f^2 = 0.101$). The effect size of colleague support ($f^2 = 0.032$) also describes a small impact on employee engagement. Job autonomy, team climate, and remuneration have insignificant direct effects and, thus, an effect size value below the 0.02 threshold (Cohen 1988). Therefore, their respective hypotheses (*H1b, H4b, H5b*) are rejected. An adjusted model is created to better compare the effect sizes of the significant predictor variables job variety, colleague support, and development opportunities. The adjusted model excludes job autonomy, team climate, and remuneration (no effect).

Figure 3:
Effect Sizes (F-Square) of Initial Model

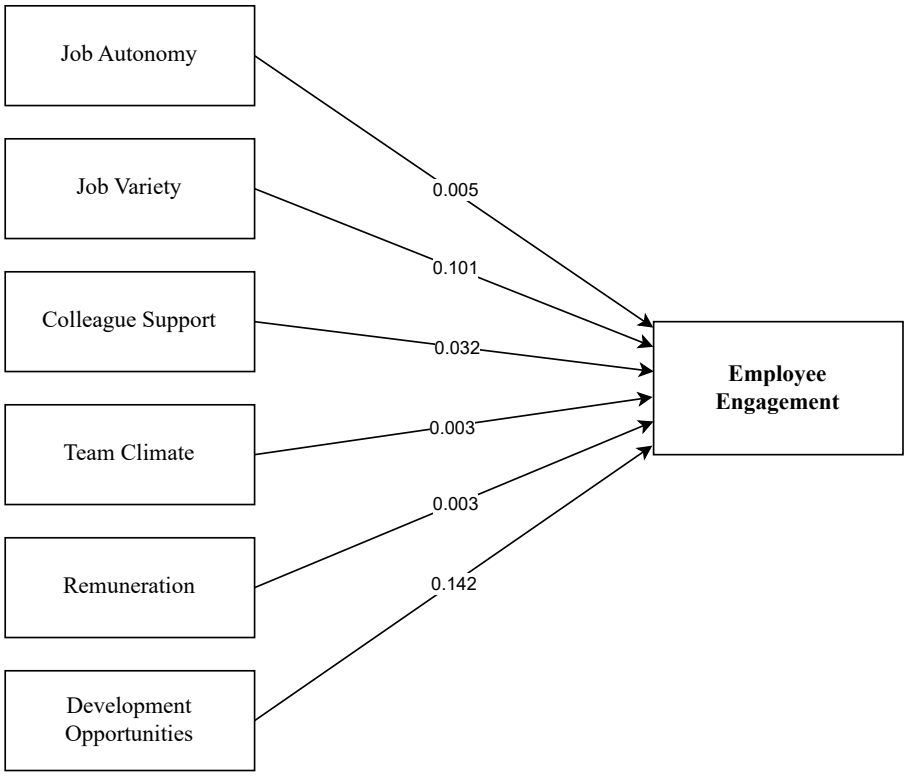


Table 3 outlines the R-square and F-square values of the initial and the adjusted model. The adjusted model indicates a higher effect size for job variety ($f^2 = 0.133$), colleague support ($f^2 = 0.081$), and development opportunities ($f^2 = 0.172$). In the adjusted model development opportunities also has the highest effect size, which increases to a moderate effect size of ≥ 0.15 (Cohen 1988). Hence, *H6b* is supported, whereas *H2b* and *H3b* are not. The R-square value of the adjusted model ($r^2 = 0.449$) slightly increases when removing the insignificant variables.

Table 3:
Effect Sizes (R-Square, F-Square) of Initial and Adjusted Model

	R-Square (R^2)	F-Square (F^2)	Remark on Effect Size	Hypothesis
Initial Model				
Job Autonomy	0.455	0.005	No Effect	H1b
Job Variety	0.455	0.101	Small Effect	H2b
Colleague Support	0.455	0.032	Small Effect	H3b
Team Climate	0.455	0.003	No Effect	H4b
Remuneration	0.455	0.003	No Effect	H5b
Development Opportunities	0.455	0.142	Small Effect	H6b
Adjusted Model				
Job Variety	0.449	0.133	Increase; Small Effect	H2b
Colleague Support	0.449	0.081	Increase; Small Effect	H3b
Development Opportunities	0.449	0.172	Increase; Moderate Effect	H6b

Note: Small Effect ($f^2 \geq 0.02$); Moderate Effect ($f^2 \geq 0.15$); Large Effect ($f^2 \geq 0.35$)

4.4 Relative Weights Analysis

The relative weight analysis (RWA; Johnson 2000) is another, more comprehensive method to determine the proportional contribution of the significant predictor variables. The analysis was performed using the free, comprehensive, and web-based tool RWA-Web (Tonidandel and LeBreton 2014). Tonidandel, LeBreton, and Johnson (2009) suggest using the bootstrapping method with 10,000 replications as a base for the bias-corrected and accelerated confidence intervals (CIs) for the individual relative weights and the corresponding significance tests (Johnson 2004). The 95% confidence interval corresponds to a 5% significance level ($\alpha = 0.05$).

Table 4 outlines the RWA results. A weighted linear combination of the three significant predictor variables job variety, colleague support, and development opportunities explains 42.43% of the variance in employee engagement ($r^2 = 0.4243$). Further analysis of the relative weights reveals that all three variables explain a statistically significant variance in employee engagement. The most critical variable is development opportunities (RW = 0.1869), followed by job variety (RW = 0.1309), and colleague support (RW = 0.1064). The relative weights from the RWA differ slightly from the F-square value analysis in Chapter 4.3. However, the ranking of the most crucial job resource remains the same, and thus RWA works in a supplementary manner (Tonidandel and LeBreton 2011). In sum, a moderate part of the predicted variance in employee engagement is attributable to job variety (30.86%), colleague support (25.09%), and development opportunities (44.06%). Given that development opportunities outrank all other job resources, there is support for *H6b*.

Table 4:
RWA Results

Predictor	RW	CI Lower	CI Upper	RS-RW (%)	Hypothesis
Criterion	*Employee Engagement ($r^2 = 0.4243$; $p < 0.01$)*				
Job Variety	0.1309	0.0637	0.2177	30.86	H2b
Colleague Support	0.1064	0.0428	0.1870	25.09	H3b
Development Opportunities	0.1869	0.1052	0.2791	44.06	H6b

Note: RW = Raw Relative Weight, CI Lower = Lower Confidence Interval, CI Upper = Upper Confidence Interval, RS-RW (%) = Rescaled Relative Weight in Percentage Points

Additionally, an examination was conducted to test if the relative contribution of development opportunities to the overall R-square significantly differs from that of colleague support and job variety. The findings reveal that the relative weight of development opportunities (RW = 0.1869) is not significantly higher than the weight of job variety and colleague support. Finally, analyses are carried out to test potential differences in the magnitude of relative weights based

on gender, nationality, and age group. The results indicate no statistically significant variations between different genders or nationalities. However, a slight statistically significant difference was observed between individuals aged 18 to 24 and those aged 45 to 55 concerning development opportunities.

4.5 Additional Findings

A factorial Analysis of Variance (ANOVA) was conducted to determine the impact of age on engagement. ANOVA is a robust statistical method used to compare means across multiple groups and is particularly suitable for understanding the effects of several independent variables and their impact on a dependent variable (Tabachnick and Fidell 2013). Before the ANOVA, multiple preliminary tests, including testing for homogeneity of variances and independence of residuals (Appendix C, Table C1), were performed to ensure the validity of the ANOVA results (Tabachnick and Fidell 2013). The ANOVA reveals a statistically significant effect of age on engagement ($p < 0.00012$, Table 5). Hence, the results suggest that age significantly impacts engagement, with specific age groups displaying higher levels of engagement than others.

Following the ANOVA, further comparisons were performed to determine specific group differences, using pairwise T-tests and Tukey's Honestly Significant Difference (HSD) method. Pairwise T-tests compare the means between each pair of age groups without adjusting for the increased risk of Type I error (McDonald 2014). Tukey's HSD is a post-hoc test that controls for the Type I error across multiple comparisons (Tabachnick and Fidell 2013).

Initial pairwise t-tests, without adjusting for multiple comparisons, provide a detailed view of the specific age groups that differ significantly in terms of engagement. The T-test results indicate significant differences in engagement between group 4 (35-44 years) and group 2 (18-24 years) ($p < 0.001$; Table 6; Appendix C, Table C2). Additionally, the T-tests outline significant differences in engagement between group 6 (55-64 years) and group 2 (18-24 years) ($p < 0.05$), between group 4 (35-44 years) and group 3 (25-34 years) ($p < 0.05$), and between group 6 (55-64 years) and group 3 (25-34 years) ($p < 0.05$).

Tukey's HSD test reinforces that the differences between specific age groups are robust and remain significant even with stricter statistical controls. Tukey's HSD test only confirms significant differences in engagement between groups 4 and 2 ($p < 0.01$), between group 6 and group 2 ($p < 0.05$), and between groups 4 and 3 ($p < 0.05$), after accounting for multiple comparisons (Table 6; Appendix C, Table C3).

Table 5:
ANOVA Results

	df	Sum Sq.	Mean Sq.	F-Statistic	P-Value	Significance
Factor: Age	4	6.27	1.567	5.998	<0.001	***
Job Variety	1	24.3	24.304	93.035	<0.001	***
Colleague Support	1	17.12	17.12	65.533	<0.001	***
Development Opportunities	1	15.28	15.279	58.486	<0.001	***
Residuals	287	74.97	0.261			

Note: df = degrees of freedom; Sum Sq. = sum of squares; Mean Sq. = mean squares; *** = highly significant

Table 6:
T-Test and Tukey's HSD Results (only significant group comparisons)

	Mean Difference	Lower CI	Upper CI	P-Value Tukey's HSD	P-Value T-Test
4 vs. 2	0.3689	0.1019	0.6360	0.0017 (***)	0.0043 (***)
6 vs. 2	0.3923	0.0558	0.7288	0.0131 (*)	0.0158 (*)
4 vs. 3	0.2973	0.0369	0.5577	0.0162 (*)	0.0181 (*)
6 vs. 3	0.3207	-0.0106	0.652	0.0631 (n.s.)	0.0448 (*)

Note: 2 = 18-24 years; 3 = 25-34 years; 4 = 35-44 years; 6 = 55-64 years; CI = 95% confidence interval; *** = highly significant ($p < 0.001$); * = significant ($p < 0.05$); n.s. = not significant

5 Discussion and Future Research

The current study examines the relationship between employee engagement and six job resources. In particular, the study identified the development of employee engagement by job autonomy, job variety, colleague support, team climate, remuneration, and development opportunities. The research question is based on more recent calls to test the enhancement of employee engagement by a variety of job resources (Guest 2014), the need to examine the nature and strength of these relationships (Saks 2019), and the demand to compare the relative importance of different job resources (Saks and Gruman 2014).

In particular, the study outlines three job resources that contribute significantly to explaining the degree of employee engagement: development opportunities, job variety, and colleague support. The findings extend the existing literature on engagement by exploring engagement antecedents that call for combined analysis. The study also helps in understanding the factors that promote employee engagement, which is particularly relevant given the concepts' positive links to individual and organizational outcomes, such as employee well-being, job performance, turnover intentions (e.g., Christian, Rich, and LePine 2011; Halbesleben 2010; Crawford, LePine, and Rich 2010) as well as higher competitive advantage and financial returns (e.g., Albrecht et al. 2015; Xanthopoulou et al. 2009).

Given the existing theoretical links among the predictor variables, the study suggests six main (a) and six secondary hypotheses (b) to test direct effects and relative weights. The data supports three of the main hypotheses and one of the secondary hypotheses. First, the results outline the evidence for the direct relationship of employee engagement with job variety, colleague support, and development opportunities and highlight development opportunities as the most crucial resource among the tested variables. Moreover, there is evidence for age to highly correlate with employee engagement, with specific age groups showing higher engagement than others. The following sections discuss the theoretical and practical implications and highlight the limitations while providing suggestions for future research throughout the chapter.

5.1 Theoretical Contributions

This chapter compares the study results with existing research on employee engagement by connecting the overall model plus each job resource to previous findings and outlines how the study extends existing literature. Although previous research has shown how various job resources relate to engagement, few empirical studies have combined the different impacts of several resources in one model (Saks 2019). The effect of job resources is assessed frequently by combining various resources into one construct called job resources (Schaufeli and Bakker 2004; Bakker and Demerouti 2007). Hence, less empirical evidence exists of the comparative salience of different job resources on engagement (Saks and Gruman 2014).

Additionally, traditional employee engagement models, such as Hackman and Oldham's (1975) job characteristics model, include factors such as autonomy, variety, or feedback. This study's findings highlight the need for adding more resources to these models. Hence, this study is among the first to respond to the suggestion to combine traditional job characteristics with other resources, such as team climate, colleague support, development opportunities, and remuneration, to contrast their differential impact on employee engagement (Saks 2006, 2019; Saks and Gruman 2014).

The study also contributes to the literature on each job resource. First, opportunities for professional development directly and positively predict employee engagement. That is in line with empirical evidence by Schaufeli et al. (2009), Bakker and Xanthopoulou (2013), and Bakker and Bal (2010), who demonstrated a positive relationship between development opportunities and employee engagement. Hence, this study outlines opportunities as a central driver of engagement, not just a by-product of a good work atmosphere.

The results outline development opportunities as the strongest predictor of employee engagement compared to other job resources. That aligns with empirical evidence from Sarti (2014), who completed a study on caregivers in long-term care facilities but enhances research by generalizing the findings. Hence, the diverse dataset supports these findings, affirming that development opportunities are a highly relevant job resource across different nationalities, generations, and industries. Highlighting the importance of development also outlines how crucial it is to enable employees to improve their skills and competencies (Idris and Dollard 2011). Hence, employees with sufficient development opportunities feel valued and optimistic and engage in their work (Bakker, Demerouti, and Ten Brummelhuis 2012). Few studies have analyzed development programs specifically focused on raising engagement levels, representing a significant knowledge gap (Bailey et al. 2015). Given the high importance of development opportunities, further research should assess which interventions on the development spectrum have the most impact and under what conditions (Bailey et al. 2015).

Second, the findings suggest job variety directly links to employee engagement, which is in line with empirical evidence outlining how job variety can motivate employees intrinsically to engage (e.g., Deci and Ryan 2001; Salanova and Schaufeli 2008; Van De Voorde, Veld, and Van Veldhoven 2016). Furthermore, job variety is the second strongest predictor of employee engagement, which confirms findings of similar studies that concluded job variety is among the most critical job characteristics from Hackman and Oldham's (1975) model for engagement (e.g., Crawford, LePine, and Rich 2010; Christian, Garza, and Slaughter 2011) but contradictory to studies finding job variety to be among the strongest overall predictors for engagement (e.g., Guest 2014, Shantz et al. 2013).

Third, colleague support is included in this study to prioritize the role of peers over supervisors, responding to recent calls that peer support may be more valuable, as supervisory support has become less associated with engagement (Bakker and Bal 2010; Mengüç et al. 2013). The findings reinforce the significant, positive, and highly relevant relationship between colleague support and employee engagement, aligning with prior studies (Halbesleben 2010; Schaufeli and Bakker 2004). Positive peer interactions contribute to a sense of belonging, making a supportive and harmonious environment instrumental in promoting employee engagement (Hakanen, Bakker, and Schaufeli 2006). Research backs this finding by outlining how belonging can enhance emotional and cognitive employee engagement (May, Gilson, and Harter 2004). The results also underscore the importance of supportive peers in enhancing employee self-efficacy and motivation (Demerouti et al. 2001; Xanthopoulou et al. 2008).

Colleagues help inspire, affirm, and support their peers to complete tasks (Kwon and Kim 2020). However, the impact of social support varies across industries, as highlighted by Sawang (2012), who found supervisor support more significant in IT professions. That suggests the need for future research to explore industry-specific differences, potentially leading to tailored support strategies that balance colleague and supervisor support effectively.

Fourth, the study challenges previous assumptions by presenting data on job autonomy that diverges from the commonly established link to employee engagement. Even though prior research affirms a positive, significant relationship (e.g., Christian, Garza, and Slaughter 2011; Bakker and Bal 2010; Halbesleben 2010), these findings align more closely with studies indicating a weak or negligible connection (e.g., De Lange, De Witte, and Notelaers 2008; Weigl et al. 2010; Mauno, Kinnunen, and Ruokolainen 2007). It becomes more common to find that job autonomy is unrelated to employee engagement when studying job variety and autonomy simultaneously since variety in tasks and roles automatically provides sufficient self-control to employees (Van De Voorde, Veld, and Van Veldhoven 2016). Hence, it might be more beneficial to combine job autonomy and variety into one construct (Karasek 1979), but that is uncommon in research (Van De Voorde, Veld, and Van Veldhoven 2016).

Fifth, contrary to expectations, this study does not find a significant or positive correlation between team climate and employee engagement. Previous studies (e.g., Bakker and Bal 2010; Hakanen, Bakker, and Schaufeli 2006) found several team climate aspects, such as job control or innovative climate, to be positively related to employee engagement, also across different cultural contexts (Llorens et al. 2007). Other studies (e.g., Torrente et al. 2012; Xue, Bradley, and Liang 2011) also highlight the importance of a supportive team climate for employee engagement, emphasizing the need for coordination, knowledge sharing, and teamwork to enhance employees' vigor, dedication, and absorption, and ultimately, their engagement. Despite the established literature supporting the positive impact of team climate on employee engagement, the results in this study do not reflect a significant or positive relationship. One reason for this divergence could be the increased emphasis on individual resources, such as development opportunities or alternative social support resources (Bailey et al. 2015; Bakker and Demerouti 2007). The evolving nature of work environments and changes in employee expectations could, therefore, alter the influence of team climate on engagement (Gallup 2023).

Sixth, remuneration does not significantly relate to work engagement when considering other job resources in the same analysis. That is a deviation from earlier research (e.g., Brown et al. 2008; Hu and Schaufeli 2011; Maslach, Schaufeli, and Leiter 2001), which found a positive

correlation between remuneration and aspects of employee well-being or engagement. However, more recent studies (e.g., Johannsen and Zak 2020) also outline the diminishing importance of financial rewards and shift to the psychological and emotional aspects of the work environment. Hence, this study underscores current findings by highlighting the significance of non-financial job resources in influencing employee engagement (Bakker and Demerouti 2007). The results suggest that in the presence of proper colleague support, opportunities for development, and job variety, remuneration does not emerge as a significant resource for employee engagement. That highlights a shift in employee attitudes, where intrinsic factors precede extrinsic monetary rewards (Gagné and Deci 2005).

Finally, this study finds that employees aged 35 to 44 years and 55 to 64 years have different levels of engagement than employees aged 18 to 34. The findings support existing research (e.g., Twenge et al. 2010), which provides evidence for different work values and engagement levels across generations. The results reveal that the older generations (35-44 and 55-64) are more engaged than the younger ones (18-24 and 25-34), aligning with reports from Gallup (2023) that show lower engagement rates for younger employees. Further research is necessary due to the lack of empirical research on engagement differences across generations. Understanding such differences can help organizations figure out optimal strategies for boosting engagement for each generation.

5.2 Practical Contributions

There are several practical implications from this study. First, the crucial role of development opportunities in boosting engagement shows that organizations should prioritize professional development initiatives to enrich the skills and competencies of employees (Idris and Dollard 2011). That way, organizations can increase how valuable and optimistic employees feel about their jobs, a crucial prerequisite for engagement (Xanthopoulou et al. 2007). Second, the correlation between job variety and employee engagement highlights the strategic importance of designing jobs with several tasks and challenges as they motivate employees intrinsically and prevent job monotony (Melamed et al. 1995). Third, the study emphasizes colleague support, which suggests that organizations should cultivate a culture of cooperative peer relationships, for example, through team-building activities and peer mentorship programs. Finally, the study outlines that organizations should tailor engagement strategies to meet the varying needs of generations (Saks and Gruman 2014). This aspect requires further research to develop effective and tailored engagement initiatives for employees from different age groups.

5.3 Limitations

Despite the theoretical and practical contributions, the current study has some limitations. First, the results are subject to common method variance due to possible methodological limitations (Podsakoff et al. 2003). The use of cross-sectional designs means the study collected data at one point in time and, therefore, cannot fully allow for causal inferences. Even though the PLS-SEM method provides possible pathways for these relationships, longitudinal studies should replicate the findings for more nuanced results. Furthermore, the analysis relies on self-reported measures to obtain data, leading to potential bias, as responses might reflect the survey method more than actual differences (Podsakoff et al. 2003). However, self-report measures are suitable for assessing employee perceptions and, therefore, appropriate for this study (Spector 1994, 2019). These measures are appropriate to understand how employees perceive engagement and job resources as these variables capture emotions and perceptions. However, future studies should use long-term or experimental designs to more accurately examine how job resources relate to employee engagement (Podsakoff et al. 2003).

Second, the generalizability of the findings is limited due to the sample characteristics. With a final sample of 310 participants, the sample size had enough statistical power for the analyses. However, future research should replicate the study with an even larger sample to make the findings more generalizable. Moreover, data collection followed the snowballing method instead of a random sampling approach. Hence, caution is necessary when generalizing the results to the larger population. The sample also had an imbalanced distribution of nationalities, with predominantly European participants (96%). Hence, the findings are less generalizable to the whole population, and scholars should aim for a more balanced sample. Furthermore, the study did not account for employees' positions within an organization, which may affect their perceptions of resources and engagement (Mazzetti and Schaufeli 2022). Therefore, researchers should address these sample characteristics to control for potential confounding effects.

6 Conclusion

This cross-sectional study compared six job resources to identify how they affect employee engagement among 310 participants. The results outline that job variety, colleague support, and development opportunities positively relate to engagement, with development opportunities ranking as the most influential job resource. Contrary to expectations, job autonomy, team climate, and remuneration failed to impact engagement significantly. The results also provide

empirical evidence that younger employees are less engaged than older ones, potentially due to varying work values and expectations. The findings show the importance for organizations to understand and address the diverse needs of employees to boost engagement.

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Appendix

Appendix A: Survey & Demographics

Table A1

Survey Items

	Question	Item
Employee Engagement	At my work, I feel bursting with energy.	EE1
	At my job, I feel strong and vigorous.	EE2
	I am enthusiastic about my job.	EE3
	My job inspires me.	EE4
	When I get up in the morning, I feel like going to work.	EE5
	I feel happy when I am working intensely.	EE6
	I am proud of the work I do.	EE7
	I am immersed in my work.	EE8
	I often get carried away when I am working.	EE9
Job Autonomy	I can decide myself how I execute my work.	JA1
	I have the freedom to decide how I do my tasks.	JA2
	The person I report to allows me to make my own decisions.	JA3
Job Variety	My job involves a diverse set of responsibilities.	JV1
	My job involves the performance of a wide range of tasks.	JV2
	My job requires me to utilise a variety of skills to complete the tasks.	JV3
Colleague Support	I can count on my coworkers when my work becomes challenging.	CS1
	I can ask my coworkers for help if necessary.	CS2
	My relationship with my coworkers is good.	CS3
	I feel appreciated by my coworkers for my work.	CS4
Team Climate	In my team, I can openly share information with others.	TC1
	In my team, I feel understood and accepted by others.	TC2
	In my team, I actively strive to share information with others.	TC3
	In my team, I can build on others' ideas for the best results.	TC4
Remuneration	I believe my company offers competitive salaries.	RM1
	I believe I receive a fair salary compared to my colleagues in my department.	RM2
	I believe I am adequately compensated for the work I do.	RM3
	I can comfortably sustain my lifestyle with my current salary.	RM4
Development Opportunities	My job offers me the opportunity to learn new things.	DO1
	I have sufficient possibilities to develop myself at work.	DO2
	I get plenty of opportunities to improve my skills at work.	DO3

Table A2

Demographic Overview

	Measure	%	Count
Gender	Male	52%	159
	Female	48%	149
Nationality	Italian	37%	118
	Austrian	25%	82
	Norwegian	7%	23
	German	7%	22
	Spanish	4%	11
Education	Bachelor's degree	42%	128
	Master's degree	33%	103
	Completed apprenticeship or specialized secondary school diploma	20%	62
	High school graduate or equivalent	2%	7
	Prefer not to answer	2%	6
	PhD degree	1%	3
Age	25 to 34	42%	130
	18 to 24	34%	104
	35 to 44	13%	40
	55 to 64	7%	22
	45 to 54	5%	14
Industry	Other	18%	55
	Consulting	17%	53
	Finance and Banking	13%	39
	Construction	10%	29
	Pharmaceuticals	7%	22
Headcount	More than 1,000	30%	92
	50 to 249	29%	87
	250 to 1,000	17%	52
	10 to 49	16%	48
	Less than 10	7%	20
Working Hours	40	38%	118
	38.5	18%	57
	20	7%	22
	37.5	5%	15

Note: The variables *Nationality, Industry, Headcount,* and *Working Hours* exclude other options with lower counts. The variables *Gender, Education,* and *Age* exclude options with zero counts. The overview is based on the cleaned dataset with N = 310.

Table A3

Complete Survey Questionnaire

Introduction
Dear participant, Thank you for your taking part in my online survey for my master's thesis, aimed at understanding employee engagement. The questionnaire will only take about 6 minutes to complete. Your responses will remain confidential and anonymous, used only for research purposes by myself and my supervisor, Dr. Carla do Rosário Costa. Feel free to exit the survey at any time or leave some questions unanswered if you prefer. By completing the survey in full, you'll have the chance to enter a lottery for one of three €20 Amazon vouchers. If you have any questions or feedback, please don't hesitate to reach out directly to me at m.rhomberg@student.maastrichtuniversity.nl. Thank you in advance for your valuable contribution to this research. Marielle Rhomberg
Declaration of Consent
By ticking the box, you consent that Marielle Rhomberg (master's student) and Dr. Carla do Rosário Costa (thesis supervisor and professor at the School of Business and Economics, Maastricht University), may use the information obtained through this survey for research purposes. The primary focus is understanding workplace engagement across different cultures and generations. Personal information such as age, gender, and nationality are gathered only for analysis and validation purposes. The data will only be accessed and analyzed by Marielle Rhomberg and Carla do Rosário Costa. The data will be stored in anonymized form on the server of University Maastricht to allow assessment and validation by educational accreditation bodies or research ethics committees. Consent is given in the Data Protection Regulation Article 6*, section. 1, point a, see. § 3 and may be revoked at any time by contacting either Marielle Rhomberg or Dr. Carla do Rosário Costa, cf. Data Protection Regulation Article 7**, section. 3. We refer to University Maastricht's data processing policy: https://www.maastrichtuniversity.nl/support/um-employees/you-and-your-work/legislation/privacy-regulations You must contact Marielle Rhomberg (m.rhomberg@maastrichtuniversity.nl) or Dr. Carla do Rosário Costa (c.costa@maastrichtuniversity.nl) at any time with requests for enforcement of the following rights: • Right to access: I have the right to gain insight into my personal information processed by the data controller. • The right to rectification: I have the right to correct my personal information processed by the data controller. • The right to be forgotten/deleted: I have the right to delete my personal information processed by the data controller. • Data Portability Right: I have the right to receive my data processed by the data controller in a machine-readable format. • Right to restrict treatment: I have the right to object and restrict the processing of my personal data processed by the data controller * GDPR Article 6 http://www.privacy-regulation.eu/en/article-6-lawfulness-of-processing-GDPR.htm ** GDPR Article 7 http://www.privacy-regulation.eu/en/article-7-conditions-for-consent-GDPR.htm

Personal Information

Are you currently employed?

- Yes
- No

How old are you?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or older

What gender do you identify with?

- Male
- Female
- Non-binary / third gender
- Prefer not to answer

What is the highest level of education you have attained?

- Lower than high school
- High school graduate or equivalent
- Completed apprenticeship or specialized secondary school diploma
- Bachelor’s degree
- Master’s degree
- PhD degree
- Prefer not to answer

What is your nationality?

- Austrian
- Dutch
- French
- German
- Italian
- Portuguese
- Spanish
- Other (please specify)

What industry do you work in?

- Agriculture
- Construction
- Consulting
- Education
- Energy and Utilities
- Finance and Banking
- Government and Public Sector
- Healthcare
- Hospitality and Tourism

- Legal Services
- Manufacturing
- Media and Entertainment
- Pharmaceuticals
- Real Estate
- Retail
- Technology and IT
- Telecommunications
- Transportation and Logistics
- Other

How many people work at your company?

- Less than 10
- 10 to 49
- 50 to 249
- 250 to 1000
- More than 1000
- I do not know
- Prefer not to answer

In which country are you currently employed?

- Austria
- Belgium
- Denmark
- France
- Germany
- Italy
- Netherlands
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- United Kingdom
- Other

How many hours are you required to work per week according to your contract?

Text Field

Resources (*)

I can decide myself how I execute my work.

I have the freedom to decide how I do my tasks.

The person I report to allows me to make my own decisions.

My job involves a diverse set of responsibilities.

My job involves the performance of a wide range of tasks.

My job requires me to utilise a variety of skills to complete the tasks.

I can count on my coworkers when my work becomes challenging.
I can ask my coworkers for help if necessary.
My relationship with my coworkers is good.
I feel appreciated by my coworkers for my work.
In my team, I can openly share information with others.
In my team, I feel understood and accepted by others.
In my team, I actively strive to share information with others.
In my team, I can build on others' ideas for the best results.
I believe my company offers competitive salaries.
I believe I receive a fair salary compared to my colleagues in my department.
I believe I am adequately compensated for the work I do.
I can comfortably sustain my lifestyle with my current salary.
My job offers me the opportunity to learn new things.
I have sufficient possibilities to develop myself at work.
I get plenty of opportunities to improve my skills at work.
Engagement
At my work, I feel bursting with energy.
At my job, I feel strong and vigorous.
I am enthusiastic about my job.
My job inspires me.
When I get up in the morning, I feel like going to work.
I feel happy when I am working intensely.
I am proud of the work I do.
I am immersed in my work.
I often get carried away when I am working.
End
Almost there... If you want to participate in the lottery for the Amazon voucher, please send an e-mail to thesis.rhomberg@gmail.com with the keyword "Master Thesis Marielle Rhomberg". Remember To Click Submit!

Appendix B: PLS-SEM

Table B1

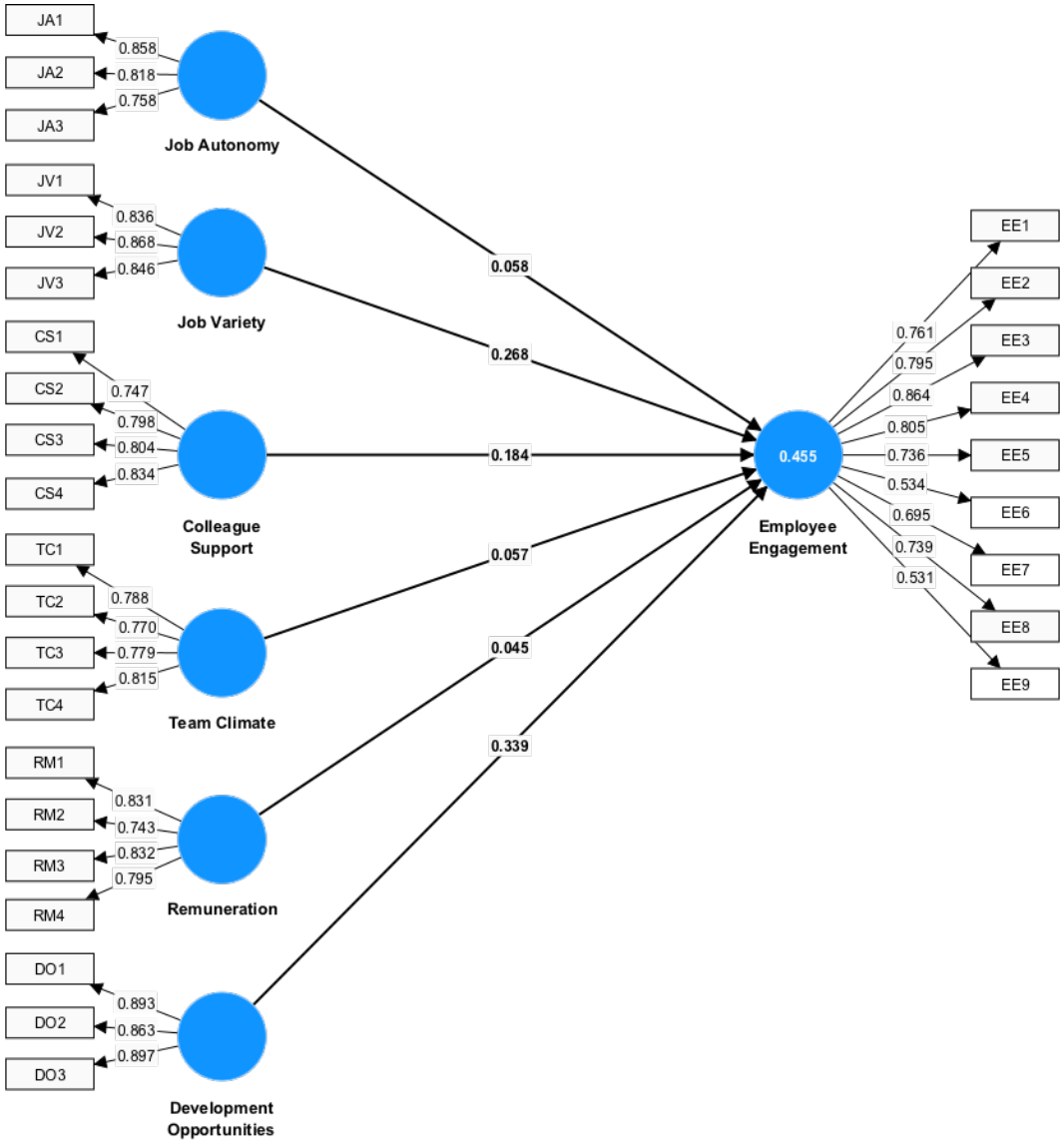
Reliability and Validity of Constructs

	OL	CA	CR	AVE	VIF
Employee Engagement		0.884	0.901	0.527	
#EE1	0.761				2.617
#EE2	0.795				2.834
#EE3	0.864				3.054
#EE4	0.805				2.388
#EE5	0.736				1.907
#EE6	0.534				1.368
#EE7	0.695				1.668
#EE8	0.739				1.872
#EE9	0.531				1.312
Job Autonomy		0.742	0.744	0.660	
#JA1	0.858				1.956
#JA2	0.818				1.890
#JA3	0.758				1.233
Job Variety		0.808	0.811	0.723	
#JV1	0.836				1.699
#JV2	0.868				2.059
#JV3	0.846				1.700
Colleague Support		0.811	0.834	0.635	
#CS1	0.747				1.743
#CS2	0.798				1.936
#CS3	0.804				1.808
#CS4	0.834				1.734
Team Climate		0.799	0.809	0.621	
#TC1	0.788				1.952
#TC2	0.770				1.814
#TC3	0.779				1.547
#TC4	0.815				1.606
Remuneration		0.818	0.839	0.642	
#RM1	0.831				1.818
#RM2	0.743				1.670
#RM3	0.832				2.169
#RM4	0.795				1.471
Development Opportunities		0.861	0.866	0.783	
#DO1	0.893				2.329
#DO2	0.863				2.038
#DO3	0.897				2.255

Note: Outer Loadings (OL), Cronbach's Alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE), Variance Inflation Factor (VIF)

Figure B1

Measurement Model



Note: Constructs: Cronbach's Alpha, Inner Model: Path Coefficients, Outer Model: Outer Loadings

Table B2

Fornell-Larcker Criterion

	DO	EE	JA	JV	RM	CS	TC
DO	0.885						
EE	0.574	0.726					
JA	0.296	0.327	0.813				
JV	0.379	0.468	0.382	0.85			
RM	0.346	0.284	0.248	0.136	0.801		
CS	0.431	0.440	0.221	0.168	0.303	0.797	
TC	0.374	0.389	0.255	0.213	0.264	0.661	0.788

Note: DO = Development Opportunities, EE = Employee Engagement, JA = Job Autonomy, JV = Job Variety, RM = Remuneration, CS = Colleague Support, TC = Team Climate

Table B3

Heterotrait-Monotrait Ratio (HTMT)

	HTMT
EE <-> DO	0.641
JA <-> DO	0.362
JA <-> EE	0.408
JV <-> DO	0.447
JV <-> EE	0.541
JV <-> JA	0.480
RM <-> DO	0.400
RM <-> EE	0.320
RM <-> JA	0.304
RM <-> JV	0.151
CS <-> DO	0.521
CS <-> EE	0.501
CS <-> JA	0.284
CS <-> JV	0.206
CS <-> RM	0.360
TC <-> DO	0.436
TC <-> EE	0.451
TC <-> JA	0.316
TC <-> JV	0.249
TC <-> RM	0.320
TC <-> CS	0.815

Note: DO = Development Opportunities, EE = Employee Engagement, JA = Job Autonomy, JV = Job Variety, RM = Remuneration, CS = Colleague Support, TC = Team Climate

Table B4

Cross-Loadings

	DO	EE	JA	JV	RM	SS	TC
#JA1	0.224	0.275	0.858	0.314	0.174	0.155	0.196
#JA2	0.156	0.229	0.818	0.226	0.160	0.176	0.145
#JA3	0.323	0.283	0.758	0.374	0.260	0.204	0.267
#DO1	0.893	0.505	0.239	0.327	0.257	0.442	0.354
#DO2	0.863	0.471	0.284	0.266	0.326	0.330	0.285
#DO3	0.897	0.544	0.264	0.404	0.334	0.371	0.350
#EE1	0.333	0.761	0.258	0.304	0.174	0.266	0.267
#EE2	0.430	0.795	0.273	0.399	0.196	0.325	0.323
#EE3	0.515	0.864	0.280	0.377	0.247	0.386	0.312
#EE4	0.576	0.805	0.196	0.419	0.214	0.342	0.308
#EE5	0.435	0.736	0.250	0.282	0.292	0.370	0.299
#EE6	0.251	0.534	0.261	0.126	0.207	0.295	0.234
#EE7	0.420	0.695	0.217	0.433	0.174	0.388	0.300
#EE8	0.402	0.739	0.240	0.269	0.248	0.305	0.313
#EE9	0.270	0.531	0.187	0.369	0.087	0.144	0.151

Table B4 Continued

#JV1	0.269	0.404	0.418	0.836	0.094	0.132	0.196
#JV2	0.303	0.359	0.259	0.868	0.062	0.104	0.123
#JV3	0.388	0.423	0.291	0.846	0.183	0.187	0.216
#RM1	0.312	0.252	0.224	0.110	0.831	0.221	0.176
#RM2	0.206	0.171	0.151	0.038	0.743	0.185	0.168
#RM3	0.260	0.176	0.190	0.028	0.832	0.264	0.188
#RM4	0.302	0.274	0.212	0.206	0.795	0.287	0.287
#CS1	0.353	0.291	0.099	0.127	0.220	0.747	0.453
#CS2	0.419	0.314	0.215	0.157	0.245	0.798	0.488
#CS3	0.299	0.322	0.238	0.129	0.204	0.804	0.519
#CS4	0.322	0.441	0.156	0.129	0.284	0.834	0.617
#TC1	0.243	0.245	0.154	0.104	0.257	0.559	0.788
#TC2	0.271	0.285	0.210	0.115	0.255	0.636	0.770
#TC3	0.214	0.311	0.160	0.181	0.104	0.413	0.779
#TC4	0.419	0.363	0.263	0.242	0.227	0.501	0.815

Note: DO = Development Opportunities, EE = Employee Engagement, JA = Job Autonomy, JV = Job Variety, RM = Remuneration, CS = Colleague Support, TC = Team Climate

Table B5

R-Squared, Q-Squared, Q-Squared Predict, PLS-RMSE, PLS-MAE, LM-Benchmarks

	R^2	**Q^2**	**Q^2 Predict**	**PLS-SEM_ RMSE**	**PLS-SEM_ MAE**	**LM_ RMSE**	**LM_ MAE**
EE	0.455	0.420					
#EE1			0.141	0.811	0.646	0.827	0.662
#EE2			0.257	0.748	0.589	0.783	0.605
#EE3			0.313	0.748	0.595	0.774	0.602
#EE4			0.345	0.794	0.641	0.78	0.618
#EE5			0.231	0.904	0.732	0.927	0.751
#EE6			0.082	1.029	0.844	1.068	0.866
#EE7			0.274	0.796	0.619	0.831	0.637
#EE8			0.187	0.846	0.678	0.873	0.698
#EE9			0.114	0.925	0.76	0.933	0.771

Note: EE = Employee Engagement

Appendix C: Additional Findings

Table C1

Preliminary Tests

Independence of Residuals / Autocorrelation / Durbin-Watson Test		
DW	P-Value	Significance
2	0.3	insignificant

Homogeneity of Variances / Bartlett's Test			
K-Square	df	P-Value	Significance
4	4	0.4	insignificant

Note:
Durbin-Watson Test: p-value > 0.05, insufficient evidence to assume significant autocorrelation in the residuals
Bartlett's Test: p-value > 0.05, insufficient evidence to assume unequal variances across the different age groups

Table C2

T-Test Results

Groups	P-Value	Significance
3 vs. 2	0.4292	n.s.
4 vs. 2	0.0043	***
4 vs. 3	0.0181	*
5 vs. 2	0.0937	n.s.
5 vs. 3	0.1792	n.s.
5 vs. 4	0.9183	n.s.
6 vs. 2	0.0158	*
6 vs. 3	0.0448	*
6 vs. 4	0.8985	n.s.
6 vs. 5	0.8496	n.s.

Note: 2 = 18-24 years; 3 = 25-34 years; 4 = 35-44 years; 5 = 45-54 years; 6 = 55-64 years; *** = highly significant ($p < 0.001$); * = significant ($p < 0.05$)

Table C3

Tukey's HSD Test Results

Groups	Mean Difference	Lower CI	Upper CI	P-Value	Significance
3 vs. 2	0.0716	-0.1168	0.26	0.8347	n.s.
4 vs. 2	0.3689	0.1019	0.636	0.0017	***
5 vs. 2	0.346	-0.0824	0.7745	0.1763	n.s.
6 vs. 2	0.3923	0.0558	0.7288	0.0131	*
4 vs. 3	0.2973	0.0369	0.5577	0.0162	*
5 vs. 3	0.2744	-0.1499	0.6987	0.3901	n.s.
6 vs. 3	0.3207	-0.0106	0.652	0.0631	n.s.
5 vs. 4	-0.0229	-0.4875	0.4417	0.9999	n.s.
6 vs. 4	0.0234	-0.3581	0.4049	0.9998	n.s.
6 vs. 5	0.0463	-0.4614	0.554	0.9991	n.s.

Note: 2 = 18-24 years; 3 = 25-34 years; 4 = 35-44 years; 5 = 45-54 years; 6 = 55-64 years; *** = highly significant ($p < 0.001$); * = significant ($p < 0.05$)