

# **Emotional Intelligence as a personal resource:**

A multi-wave study of socio-psychological factors influencing well-being and performance of agile team members

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## **ABSTRACT**

While the Agile methodology is increasingly adopted for its organizational benefits, social competencies become crucial for team members, as its cross-functional and self-managing nature demands intensive interactions. Among these interpersonal abilities, EI plays an important role, especially given its applicability and value in the Agile context. However, there is insufficient understanding of how it interacts with the prevailing socio-psychological factors and contributes to individual job-related outcomes over time. Thus, this study's objective is to examine the temporal relationship between Agile team member EI and the agile-specific socio-psychological factors of psychological safety and work-related stress and how they contribute to well-being and job performance. Self-report survey data was collected at an interval of 3 weeks from 9 Agile teams at a large Dutch financial services company. The data was analyzed using quantitative methods, whereby descriptive statistics were reported, and inferential statistics were applied for hypothesis testing. Results showed that EI proves to be a significant and positive predictor of well-being. Furthermore, whereas work-related stress does not intervene in the relationship between EI and WB, psychological safety partially mediates this relationship. Subsequently, well-being positively influences team members job performance. This study further sharpens the understanding of EI in the Agile context by showcasing its consequences on team members' job-related outcomes and unveiling the significance of temporal factors.

## **Keywords**

Agile Team, Emotional Intelligence, Psychological Safety, Work-Related Stress, Well-Being, Job Performance

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# 1. INTRODUCTION

## 1.1 Problem Statement

Recent decades characterized by the rise of globalization, formation of new business models, emergence of disruptive technologies, and shifts in consumer preferences have intensified competition across markets (Lahiri et al., 2008; Tripsas, 2007). At the same time climate change, geopolitical tensions, and economic challenges caused by the late pandemic pose numerous uncertainties for organizations (Sharif et al., 2020). To tackle these, corporations need to attain more adaptive operational models allowing them to gain or retain their competitive advantage.

One such trend that currently has received attention is the deployment of the Agile methodology (Dyba & Dingsoyr, 2009). Organizations move away from traditional product development towards the iterative practice, as it enables swift adaptation to the volatile business environments and embraces frequent product requirement alterations (Noteboom et al., 2021). Given its success in the technical domain, the methodology is increasingly adopted within different organizational functions and industry domains e.g. construction, service and education industries (Ciric et al., 2018). The framework enables the delivery of high-quality output in the context of short timeframes and changing scope. Value release is expedited by continuous prioritization of product constituents and scope flexibility is maintained through iterative revision of requirements (Cao & Ramesh, 2008). However, this does not come at the cost of build quality, as the iterative approach identifies defects early on (Talby et al., 2006) and customer satisfaction is ensured by their constant involvement throughout the development cycle (Tam et al., 2020).

A distinctive feature of Agile teams is their coordination and composition. These can be cross-functionally organized, consisting of members from various departments varying in their skills and backgrounds (Inayat & Salim, 2014). Furthermore, teams are self-managing. Thereby, decision-making, and responsibility is autonomously determined without supervision (Hoda & Murugesan, 2016). This design intended to overcome inefficiencies in traditional project management is one of the methodology's greatest assets, but at the same time a challenge. Social interactions become critical in the absence of formal leadership, which poses a threat to the team's effectiveness and performance (Weerheim et al., 2018). The mere adoption of the Agile method, in the absence of the corresponding behavioral shifts leads to unsuccessful execution

(Gandomani & Nafchi, 2016) and it is therefore essential to explore social competence characteristics that can advert pitfalls of the intensive social interaction of self-managing teams. One of these social competences is Emotional Intelligence (EI), a topic of interest in organizational behavior research due to its various beneficial effects in the occupational context (Menges, 2012). The concept deals with an individual's capability to acknowledge, comprehend and control their emotions and those of others (Salovey & Grewal, 2005). It has displayed the potential to increase team member performance and satisfaction as a result of self-motivating goal setting (Spence et al., 2004), the retention of cognitive and emotional resources to cope with job demands (Cai et al., 2016) and stress reduction (Ashkanasy et al., 2017). EI closely relates to the Agile principles, as being self-aware and conscious of others enables individuals to communicate better (Oh et al., 2015), which is one of the four guiding principles of the adaptive methodology. Furthermore, it has been shown to enable individuals to be more adaptable and susceptible to change (Huy, 1999) which is also one of the Agile fundamentals. And yet, despite its potential to address challenges of team member well-being and performance in Agile teams, EI has been insufficiently explored in the Agile context. While there is a growing body of research on the direct effects of EI on Agile team dynamics, e.g., teamwork, trust, communication, and leadership (Lindsjörn et al., 2016; Ansari et al., 2024; Luong et al., 2019), there is a lack of insights on how it unfolds and can affect well-being and performance. More specifically, existing studies are mainly cross-sectional (Schaufeli & Taris, 2013), not accounting for the time required for EI to influence individual job-related factors e.g. well-being. Yet, research on the social capability has highlighted that its relational benefits develop over time (Schutte et al., 2001). Furthermore, interpersonal affective dynamics have been shown to influence others' behaviors over different durations, highlighting the lasting effects, such as emotional synchrony, and delayed effects, such as emotional contagion (Butler, 2015). The importance of time is further accentuated in the Agile context, as team members have to continuously realign with its external environment e.g., new organizational demands or changing requirements (Lowell, 2023, pp. 59-64).

In this regard, two explicit issues that arise during the intensive interactions of Agile team members are psychological safety (PS) and work-related stress (WS). Given the development processes, a great degree of visibility, stagnation or defects of individuals are apparent to the overall team. Hence individuals experience fear of being judged negatively and inhibition in sharing their weaknesses – low levels of PS (Conboy et

al., 2010). This matter does not only affect individuals but also the overall project success, as the failure to communicate knowledge gaps results in longer delivery lead time and delays (Lalsing et al., 2012). The transparency of the Agile methodology can also induce voluntary self-exploitation, as the estimation of work items is visible to the entire team, individuals might tend to understate the required effort not to be perceived as low performers and later experience WS (Pfeiffer et al., 2019).

## 1.2 Research Objective

Therefore, since EI's relevance in the Agile context is gradually acknowledged and yet under-researched, the dynamic and time-dependent individual-level mechanisms influencing team member well-being and performance requires further investigation. Hence the research question that this paper aims to address is as follows:

***To what extent can team members' Emotional Intelligence influence their well-being and job performance through psychological safety and work-related stress?***

To address this paper's objective the Job Demands and Resource (JDR) Model is deployed to analyze the dynamics of EI and Agile paramount factors contributing to the well-being and job performance of team members. A time-lagged model complements this to capture the full extent of EI's influence on socio-psychological and individual outcomes. The variables measurement at three time points within an iteration, the model can detect delayed effects and account for behavioral or cognitive responses that are not immediate.

## 1.3 Theoretical and Practical Contributions

By answering the research question, this quantitative study expands the theoretical understanding of EI in the Agile context by exploring the processes whereby it can influence well-being and performance over time. More specifically, firstly, this thesis uncovers in which manner EI interacts with the psychological safety and work-related stress (Agile-specific socio-psychological factors) experienced by individuals. In doing so, this paper also advances the application of the JDR model by encompassing personal resources which have been seldomly accounted for (Lee et al., 2019) and examining individual-level factors in a team-level environment rather than solely in isolation (Schaufeli & Taris, 2013). Secondly, the paper elucidates the role of time with

relation to the dynamic effect of EI on the job outcomes by utilizing a time-lagged design, hence addressing the issue of reciprocal causation that emerged in longitudinal JDR research (Lesener et al., 2018), as the panel design established precedence (Wang et al., 2016).

From a practical perspective, the insights from this work are likely to be beneficial to organizations intending to transition towards an Agile approach as it highlights the people factor or for businesses that observe human-related difficulties in their deployment. The results should support professionals in the selecting non-technical criteria in recruitment, training programs for the existing workforce, and preparational activities for an Agile transition. Additionally, the gathered insights could aid Agile practitioners in gaining awareness of those soft skills that they should develop to increase their resilience in Agile environments and, ultimately, performance.

#### 1.4 Outline of the study

This paper first discusses the theoretical background, which provides an overview of the Agile context, empirical understanding of EI, and the occupational stress model. In accordance, the hypothesis development will subsequently outline the affiliations of the concepts examined hereby, framed within the JDR Model. Thereafter, the methodology section elaborates on the approach employed to capture and analyze data for concluding theoretical significances. The subsequent results section presents the findings of the quantitative analysis, for which the theoretical and practical implications are described in the discussion chapter. Lastly, the conclusion reconciles the findings with the problem statement of this thesis.

## 2. THEORETICAL BACKGROUND

### 2.1 Scrum Methodology

The embodiment of the Agile methodology took place in 2001 when 17 practitioners of light software development formulated the Agile manifesto, laying out four guiding values (Beck et al., 2001), namely:

1. Individuals and interactions over processes and tools
2. Working software over comprehensive documentation
3. Customer collaboration over contract negotiation
4. Responding to change over following a plan

While there are several Agile practices e.g. Kanban, Extreme Programming, Crystal, etc., Scrum is one of the most popular as its flexibility allows adaptability to an organization's specific needs or constraints (Masood et al., 2020). Traditionally in a scrum team, there are three different roles: product owner, scrum master, and team member or developer (Mundra et al., 2013). The product owner's (PO) responsibility is to maximize the value delivered by the team which is accomplished by managing and prioritizing the product backlog, a decomposition of customer requirements in work items (Sverrisdottir et al., 2014). The scrum master (SM) accompanies the team throughout their activities to ensure the correct utilization of the scrum methodology, facilitates daily interactions among team members, and removes any obstacles to the development activities (Bass, 2014). Team members (TM) are the individuals which are completing the work laid out by the PO in time intervals (sprints) of one to four weeks (Abrahamsson et al., 2017).

Throughout a sprint, there are four major events: backlog refinement, planning, review, and retrospective meeting. The backlog refinement meeting takes place before the planning event and serves for the TM to clarify and discuss the product backlog with the PO (Del Nuevo et al., 2011). The planning event is hosted before the start of the sprint, during the meeting the PO and the TM make a selection from the backlog of those work items that will be completed throughout the iteration based of their capacity (Marcal et al., 2007). Once the sprint finishes, the sprint review takes place in which the TM presents the iteration accomplishments to the PO and product stakeholders (Marcal et al., 2007). Lastly, a retrospective meeting is held to identifying improvement opportunities; thereby all scrum roles discuss successes, setbacks, and how to address such in the upcoming sprint (Del Nuevo et al., 2011).

## 2.2 Emotional Intelligence

Collaboration, communication, and coordination are crucial skills for successful software development (Sharp & Robinson, 2010) and gain in importance in the Agile setting, given the intensive exchange required with several stakeholders (Schön et al., 2016). EI has been found to be a key factor in cultivating these skills through culminating trust, belonging, and efficacy (Druskat & Wolff, 2001). Furthermore, it can foster an individual's resilience (Schneider et al., 2013), and openness (Winton & Sabol, 2022), carving the team's adaptability to changing demands and ultimately contributing to the project's success (Cao et al., 2009). In considering the influence of EI on an individual's job outcomes, it is relevant to distinguish between immediate and delayed effects. While some aspects, e.g., empathizing with colleagues to manage conflicts can take place instantaneously, establishing social relationships requires time to unveil throughout a gradual process (Schutte et al., 2001). Given the dynamic and evolving effects of EI, the relevance and consideration of time and the time horizon are reiterated throughout. In the context of Agile teams, it becomes evident that EI is an essential capacity for individuals to evolve into self-managing squads and hence crucial to clarify its origins, definitions, and facets.

EI has been broadly defined as an individual's capacity to perceive, understand, and regulate their emotions and those of others (Salovey & Grewal, 2005). Since its inception differences in theory, measurement, and practical application have led to the concept's separation into three distinct academic streams: the ability, trait, and mixed model (O'Connor et al., 2019). The earliest conceptualization of EI was introduced by Salovey and Mayer (1990, p. 189), and defined it as "the ability to monitor one's own and other's feelings and emotions to discriminate among them and to use this information to guide's one's thinking and action". The model operationalizes it as the capacity to assess, express and regulate the emotions of oneself as well as those of others but also to utilize them for problem-solving activities. Furthermore, it is worthy to mention that the definition explicitly refers to this component of social intelligence as an ability, which therefore can be developed and improved over time through e.g. accumulating experience (Mayer et al., 1999).

A subsequent stream of research originating in the early 2000s by Petrides et al. induced the notion of emotional intelligence as a trait, also referred to as emotional self-efficacy. It defines the component of social intelligence as a range of personality



profiles that result in behaviors in emotion-related situations. Moreover, it is put forward that the trait's benefits are only situational, reasoning that personality profiles need to be matched with a context's characteristics e.g., job description or requirements in order to yield advantages (Petrides, 2011). The difference in the trait definition is further emphasized in the type of measurement, as it examines the perception of individuals in identifying and managing their emotions self-report measures are employed as opposed to maximum performance tests in the ability theory (O'Connor et al., 2019).

The third and most recent branch of research on EI is the mixed model, considering the social intelligence element as a blend between cognitive abilities and personality traits (Lyusin, 2006). Daniel Goleman, one of the prominent researchers in the mixed-model domain, defines EI by using five components (Goleman 1998). These consist of self-regulation, social ability, motivation, self-awareness, and empathy, whereby the latter two are traits and the remaining abilities. His book *Emotional Intelligence* published in 1995, popularized the research domain to the professional field, by expressing the capacity's practical applications e.g. enabling leaders to motivate individuals and position the team in accordance with their potential for success (Goleman, 1995).

This paper will assume the ability perspective, as its distinction from personality leads to a clearer conceptualization and precise evaluation of EI (Mayer et al., 2007). Additionally, the ability model offers greater practical applicability, as it presumes that EI is a capability that can be developed, improved and therefore targeted through pragmatic interventions. In particular, this study will utilize the Wong and Law Emotional Intelligence scale (WLEIS) of EI, given its demonstrated reliability and validity across diverse research settings (Carvalho et al., 2016; Traymbak et al., 2022).

### 2.3 Job Demand Resource Theory

To uncover whether and how emotional intelligence aids practitioners of the Agile methodology in coping with their environment, this paper makes use of an occupational stress model, as it enables framing the factors at play and their interactions. The Job Demand-Resource (JDR) model was introduced in 2007 by Bakker and Demerouti to examine employee entanglement and performance. It postulates that employee well-being and engagement result from an interaction of a job's unique demands and resources. Job resources are those aspects that support

an individual to carry out their obligations, they serve as motivators and lead to employee engagement. Contrary job demands are factors that require employees' psychological, cognitive or emotional expenditure to overcome, whereby their presence reduces well-being. The occupational components do not exert their influence independently of each other but exercise a reciprocating effect, thus despite high job demands an employee might display high levels of wellbeing as it has the necessary resources to cope.

Prior to the JDR model, the occupational stress domain encompassed earlier theories that discuss specific variables. The Demand-Control model was one of the earliest approaches to the field which dictated that job strain resulted from a mismatch between workload and work-related decision latitude (Karasek, 1979). A further model introduced subsequently is the Effort-Reward imbalance which proclaims that professional distress arises from an imbalance between an individual's effort and its remuneration or recognition (Siegrist, 1996). Whereas both models have been extensively utilized in academia to advance the occupation stress domain, JDR allows the consideration of a wider spectrum of organizational factors in examining employee engagement or performance and permits framing a broader set of elements (Bakker & Demerouti, 2016) that are relevant in the Agile context of this research. As this research investigates the buffering effect of Agile team member EI on work-related stressors to address well-being, the JDR theory proves most suitable. Its flexibility allows the inclusion of a broader set of occupational factors and the assessment of the dynamic interplay of Agile-specific work-related pressures e.g. work-related stress and psychological safety.

## 2.4 Hypothesis Development

### 2.4.1 Emotional Intelligence as Job Resource

Employee well-being is a multidimensional concept that is defined beyond job satisfaction (Grant et al., 2007). It refers to an individual's physical, psychological, emotional and social wellness (Pradhan & Hati, 2019, Grant et al., 2007) in the occupational context but also outside of it (Ilies et al., 2007). Well-being is closely linked to organizational health and closely associated with job outcomes e.g. turnover intentions and performance (Page & Vella-Brodrick, 2008). Drawing on the JDR theory, an individual's EI is regarded as a resource contributing to employee well-being but also aiding in combatting the negative effects of job demands. More specifically it

falls within the category of personal resources, an under researched area suggesting that individuals possess and can develop abilities to influence their environment (Lee et al., 2019).

EI aids individuals at coping with emotionally demanding environments, by adjusting their behavior to match external conditions (Brunetto et al., 2012). Additionally, it has been observed that individuals with high EI engage more in health-related behaviors as part of their self-regulation e.g. exercise or a balanced diet, resulting in increased levels of physical well-being (Zeidner et al., 2011). Lastly, it contributes to social well-being, as it builds up the social competencies of individuals assisting them to establish personal relationships and averts negative states caused e.g., by peer rejection (Mavroveli et al., 2007). Therefore, it is expected:

***Hypothesis 1:** Team members' EI positively influences well-being.*

#### 2.4.2 Psychological Safety and Work-Related Stress

Psychological safety (PS) is defined as the “shared belief held by members of a team that the team is safe for interpersonal risk taking” (Edmondson, 1999, p. 350). It describes an occupational environment where individuals can take risks or experiment, and not be frowned upon by others, but rather be encouraged and receive constructive feedback (Edmondson, 1999). According to the JDR theory PS qualifies as a job resource, as it entails a supportive atmosphere, exhibiting higher levels of communication and knowledge sharing (Newman et al., 2017). Furthermore, supporting its classification as a job resource it has been shown to not only lead to higher performance (Hennel & Rosenkranz, 2020) but also improve employee well-being (Sharifirad, 2013; Zhang & Song, 2020). Moreover, few studies researching team effectiveness and the benefits of psychologically safe workplaces uncovered the enabling effects of emotional intelligence (Harper & White, 2013). It is being put forward that the ability to recognize and regulate the emotions of oneself and others, leads to enhanced conflict management practices, which in turn forges an environment where ideas or differences can be discussed freely (Ghosh et al., 2012). Hence, in accordance with the JDR theory, EI assumes the role of a personal resource and PS is considered a job resource it is hypothesized:

***Hypothesis 2.1:** The relationship between team members' EI and well-being is positively mediated by psychological safety.*

In organizational theory research, occupation stress is holistically viewed as a Person-Environment mismatch (Schuler, 1980), that results in a state of mental or physical strain (Hessels et al., 2017). Next to impaired professional performance (Muraale et al., 2017), its occurrence negatively impacts an individual's medical, psychological and behavioral well-being (Quick & Henderson, 2016). In early research this misalignment was ascribed to employment arrangements stipulating considerable demands without sufficient autonomy (Karasek, 1979) or compensating a subordinate for the effort exerted (Siegrist, 1996). Stress and overall job demands are, in the absence of the same or a greater number of resources, associated by the JDR theory as detrimental to employee well-being and subsequently performance (Bakker & Demerouti, 2007). The abilities of EI to address strain has been extensively examine in the healthcare domain due to its high-pressure environment (Watson et. al 2009). The social intelligence capability is shown to be negatively related to stress in nursing, as it increases coping resources (Gorgens & Ekermans, 2012) and requires less emotional labor to overcome occupational challenges (Mikolajczak et al., 2007). A more recent study by Rezvani and Khosravi (2019) explore the performance-diminishing role of stress in the context of information system development and confirmed as well EI's ability to reduce strain. Therefore, it is expected:

***Hypothesis 2.2:** Relationship between team members' EI and well-being is negatively mediated by work-related stress.*

#### 2.4.3 Well-Being and Performance

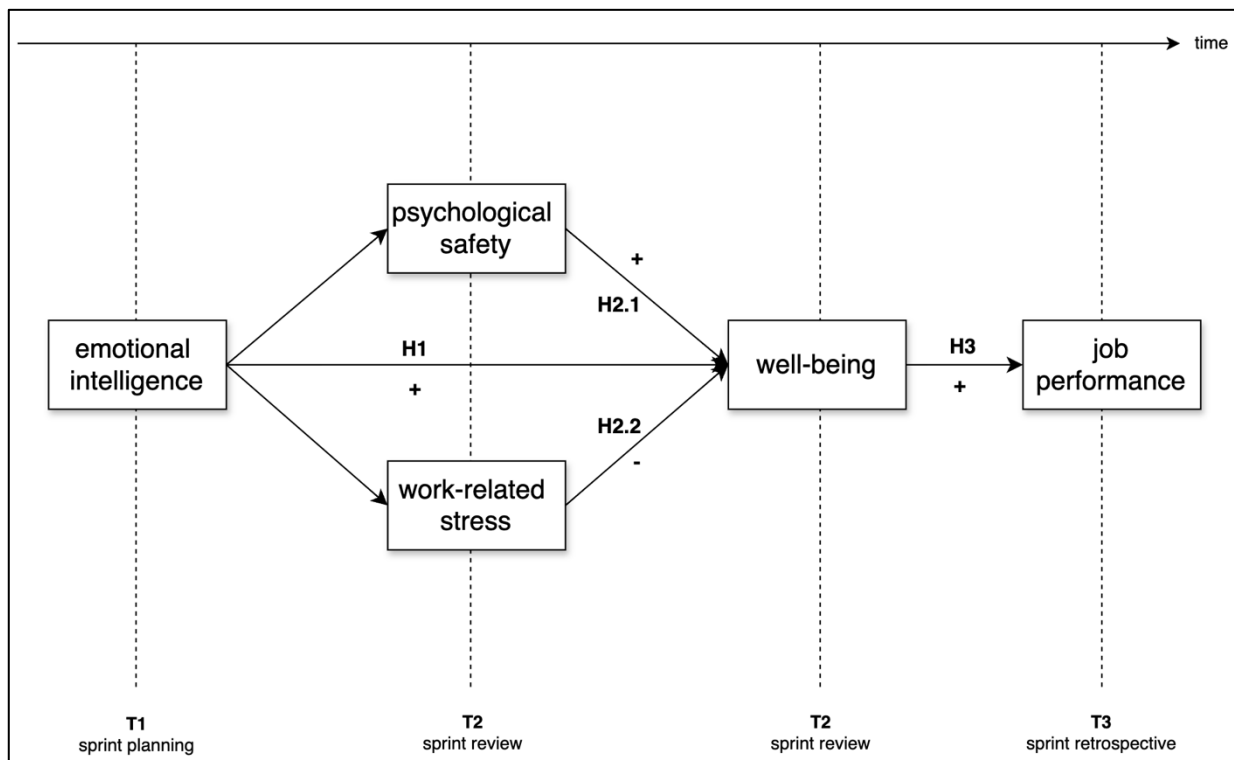
Individual job performance has been intensively examined in academia due to its close link to organizational success (Aguinis et al., 2011). Performance is defined as the behaviors of individuals while addressing their work-related objectives - process performance, and the results of their occupational engagements – outcome performance (Reijseger et al., 2013). Three primary theoretical models explain the effects of well-being on performance: happy-productive workers, effort recovery and self-determination theory (Taris & Schaufeli, 2015). The happy-productive workers model refers to affective well-being prediction of performance (Cropanzano & Wright, 2001), the effort recovery argument highlights the negative effect of insufficient recovery on work fulfillment (Meijman & Mulder, 1998), and the self-determination theory puts forward that an occupational context satisfying psychological needs results

to higher individual outcomes (Deci & Ryan, 2000). The causal relationship of well-being and performance has been often researched leading to inconclusive findings (Daniels & Harris, 2000). The ambiguous relationship might be due to their multidimensionality, whereas different facets of well-being influence certain dimensions of performance (Gutiérrez et al., 2020). Therefore, it is hypothesized:

*Hypothesis 3: Employee well-being has a positive influence on performance.*

## 2.5 Conceptual Model of Emotional Intelligence, Well-Being and Job Performance

Summarizing the previously discussed hypothesized relationship, the conceptualized model of this study is displayed below.



**Figure 1:** Conceptual model diagram

### **3. METHODOLOGY**

#### **3.1 Research Design**

This paper employs an empirical behavior research design to uncover the relationships among EI, occupational stress components, WB and JB of Agile team members. As the research objective is to determine whether there are effects between different concepts, their strength and direction, the explanatory study follows a correlational design that uses primary hypothesis testing as a statistical method to uncover the causal relationships (Saunders et al., 1996). Furthermore, the use of quantitative data has been established due to its reliability in inferring insights into the population (Polit & Beck, 2010), enabling findings to be considered for the overall Agile practitioners. Moreover, the research design choice corresponds to the operationalization principles of the concepts examined e.g. EI is not dichotomous, it is an individual's specific level along a spectrum, and therefore allows to assess effect sizes but also comparisons across different groups. Lastly, the repeated measures of PS, WS and WB allow the use of the time-lagged research methodology, enabling to capture delayed or sustained effects of the variables over time (Zanobetti, 2000) and establishing temporal precedence between factors compared to cross-sectional studies (Wang et al., 2016). In particular, the observation of EI at the first time point will be used to uncover its effect on PS and WB until the second point in time, and subsequently display their consequence on WB until the third point in time. Combining the statistical power in concluding inferences using quantitative data, the ability to observe effects over time enabled through repeated measurements and power of time-lagged studies to uncover causal links, provides the best means to discover the influence of EI on WB and JP through socio-psychological stressors.

#### **3.2 Data collection**

The observations of this study were collected by the Organizational Behavior, Change Management & Consultancy group of the University of Twente, as part of a larger research with the aim to understand what behaviors make up high-performing teams. During a period of 4 years (2018 – 2022), several Agile teams at one of the largest Dutch publicly traded companies were accompanied whereby video and survey data was collected. This paper's employed data collection corresponds to the design of a time-lagged study, as measurements were captured via self-report surveys during a

team's sprint planning, review, and retrospective meeting to ensure a valid intra-individual change assessment (Wang et al., 2016b). The three-week time interval of these observations establishes temporal separation of the independent and dependent variable to inhibit common method bias and is sufficient to capture the effects of the behavioral changes (Podsakoff et al., 2011), as these are expected to take place in a rather short time frame ranging from day to weeks. Lastly, it is worth to mention that prior to the data collection, the research has undergone ethical review by the BMS faculty of the University of Twente and therefore this paper falls subject to it.

### 3.3 Sample Description

The sample of this study consists of 71 individuals split across nine teams, out of which seven are POs. On average each team has 7.8 members, whereas the one with the least consists of five individuals and the largest of 10. In total the percentage of men (72%) outweighs that of the women (28%) and can also be observed at the team level except for two squads, one of which is composed of 75% women and the other has an equal proportion of both genders. The age range in the sample starts at 22 and ends at 65, with an average sample age of 35.96 years. 35% of the sample fall within the age range of 22 to 37 years, which also corresponds with the average age within the team apart of two teams, which display a mean age of 41.8 and 57.8. In terms of nationality, 50% of the sample is Dutch, 10% English, and the remaining are split across German, Belgian, Polish, and Spanish. Across the nine teams Dutch remains the dominant nationality except in two teams that consists of mainly English or Other nationals. On average each individual has worked in an Agile setting for 3.3 years, whereas the team with individuals averaging the highest Agile experience reaches 5.8 and the lowest 0.8 years.

### 3.4 Measures

The following sections provide an overview of the different constructs measured in this study and elaborate the theoretical background. All items are self-report measures using a 7-point Likert scale which ranges from strongly disagree to strongly agree with the only exception for the well-being variable that make use of a span from never to always. For a detailed overview of each item that has been used to assess a variable see the appendix.

### 3.4.1 Independent Variable

**Emotional Intelligence (EI).** EI was measured during the sprint planning meeting (T1) by employing the Wong and Law (2002) Emotional Intelligence Scale (WLEIS). The EI ability-based measure is examined four sub-dimensions: self-emotion appraisal, regulation of emotion, use of emotion or others-emotion appraisal category. For each category the TMs of the sample were prompted to rate four statements. Sample items are: “I have a good understanding of my own emotions”, or “I always know my friends’ emotions from their behavior”.

### 3.4.2 Mediator Variables

**Psychological Safety (PS).** PS is quantified using three items (Deter and Burris, 2007) that TMs had to rate during the sprint review meeting (T2). These aim at assessing a TMs confidence to make suggestions, express opinions, or speak up. Sample items for the PS measures are: “During the past meeting, it felt safe for me to make suggestions”, or “During the past meeting, it felt safe for me to give my opinion”.

**Work-Related Stress (WS).** For WS a self-report measured based on Gessels et al. (2017) is made use of that allows capturing the actual stress experienced by individuals by excluding stressors. Participants were prompted to rate a total of five statements during the sprint review session (T2), following a format as “My job is more stressful that I had ever imagined”.

### 3.4.3 Dependent Variables

**Well-Being (WB).** WB is evaluated using the PANAS short developed by Watson and Clark (1988). During the sprint review meeting (T2) respondents were tasked to rate 7 positive (e.g. inspired or determined) and 7 negative (e.g. nervous or afraid) affects experienced; these cumulatively help in determining the level of well-being.

**Job Performance (JP).** The measurement of individual JP makes use of the concepts discussed by Gibson et al. (2009). Respondents were asked during the sprint retrospective session (T3) to rate four items referring to their performance consistency, effectiveness, frequency of mistakes and output quality e.g. “I am consistently high performing” or “I am effective”.



### 3.4.4 Control Variables

The control variables in this study are age, gender and agile experience. EI has been found to peak in the middle-aged adults and is more prominent among women (Cabello et al., 2016). Regarding WB, past research suggests females experience higher levels in early life, but this inverts in later stages (Inglehart, 2002). Furthermore, JP does not showcase any differences across the genders; however, research on age is inconclusive, while some studies report significant differences across non-core task dimensions (Ng & Feldman, 2008) and others finding no effect (McEvoy & Cascio, 1989). Lastly, agile experience displays influence on WS and PS, whereby inexperienced practitioners exhibit higher levels of strain and fear during interpersonal interactions (Meier et al., 2018).

## 3.5 Data Analysis

### 3.5.1 Exploratory Data Analysis & Demographics

The analysis of the data collected commenced with the descriptive statics to gain a holistic view of the sample's characteristics e.g. central tendency, dispersion, and distribution. Furthermore, these insights provided the basis to determine the magnitude of data cleanup and outlier handling needed, before proceeding with inferential statistics. A further necessity prior to the hypothesis testing was the missing data analysis, in which its pattern and extent was evaluated for selecting the appropriate strategy in dealing with them. In this study, to evaluate the manifestation of absent data the Little's test of missing completely at random (MCAR) was used. An insignificant result indicates that values are MCAR and do not imply a bias in the sample (Little, 1988), which therefore allows for either acceptance or imputation techniques (Nakai et al., 2014). An additional assessment prior to the multivariate examination was the reliability analysis, which ensures that the insights gathered from the sample are accurate and valid (Tavakol & Dennick, 2011). The internal consistency between the survey items that measure the same construct is assessed by employing Cronbach's alpha, whereby the threshold of 0.7 is regarded (Cortina, 1993). Moreover, to validate the measurement model a confirmatory factor analysis (CFA) was conducted to ensure that questionnaire items are capturing the intended constructs.

### 3.5.2 Inferential Statistics & Regression Analysis

The multivariate analysis sets off by reviewing the assumptions for correlation and regression. The conditions of linearity, homoscedasticity, and outliers were verified by utilizing visual methods e.g., box and scatter plots. Next to that, the assumption of normality was assessed through indicators e.g., skewness, kurtosis, and the Shapiro Wilk's test. Lastly, the requirement of independence was validated through the data collection method and confirmed with the use of the Durbin-Watson test for independence. To evaluate the first two hypotheses examining the relationship of EI to WB (**H1**) and WB to JP (**H3**), a linear regression analysis was performed. This analysis makes use of the coefficient of determination to specify the relationship between two variables, by looking at the predicted variation in the dependent variable explained by the independent factor (Saunders et al., 1996). The investigation of PS and WS serving as intervening factors between team members' EI and WB (**H2.1 and H2.2**) mediation analysis will be performed. The relationships tested conform to the concept of parallel or multiple mediation, whereby there is a direct effect of the predictor on the dependent variable and two specific indirect effects through the mediators (Hayes, 2009). This analysis made use of the bootstrapping approach to mediation, using Hayes' PROCESS Macro for SPSS, as it overcomes the limitations of the causal step approach in terms of sample size sensitivity, low statistical power, and restrictive conditions (Hayes, 2009).

## 5. RESULTS

### 5.1 Missing Data Analysis and Management

Out of 71 observations of this study's sample, complete data is available for 67.6% of participants, with an apparent increase in missing data throughout the data-gathering period. With regards to the missing data pattern, the Little's MCAR test did not yield a significant result ( $X^2 = 230.847$ ,  $df = 208$ ,  $p = 0.133$ ), similarly no trends have been observed in the data pattern matrix, suggesting the that the data is missing completely at random (Little, 1988). In an effort to maintain statistical power imputation techniques were considered, however the preliminary results displayed signs of bias when compared to deletion of observations containing missing data. Consequently, listwise deletion was employed as a missing data management technique, therefore the following sections are based on a final sample size of 48 observations.

### 5.2 Validity and Reliability of the Measurement Model

Confirmatory factor analysis was conducted to assess the validity of the measurement model. The model fit indices of the hypothesized 5-factor model were  $X^2(809) = 2075.136$ ,  $CFI = 0.304$ ,  $RMSEA = 0.182$ ,  $SRMR = 0.158$ , indicating a poor model fit. A decision against item removal to improve model fit was made, as it could lead to the misspecification of well-established measurement models and subsequent invalid inferences. As highlighted in section 5.1, the sample size of this study was relatively small, which in (confirmatory) factor analysis is problematic due to fit indices sensitivity, inaccurate parameter estimates, or model convergence issues (Kyriazos, 2018), and therefore model modifications might be based on unreliable indicators. Additionally, to ensure discriminant construct validity, a 1- and 3-factor model was compared against the hypothesized factor structure. The 3-factor model (T1, T2 and T3) was used to capture the potential measurement timepoint correlation and the 1-factor model served as a baseline. As displayed in Table 1 the presumed 5-factor model (EI, WS, PS, WB and JP) reached the highest model indices.

Lastly, an assessment of the survey's items was conducted to ensure the consistent measurement of the variables, by employing Cronbach's alpha coefficient. The internal consistency score of each variable, with the exception of WS, surpassed the threshold value of 0.7 (see Table 2). With regards to WS it is argued that the Cronbach Alpha value of 0.68 is acceptable, as the metric has been shown to be less precise when

dealing with a low number of items (Cortina, 1993). WS was measured using 5 questions, and removing a component could compromise the measurement construct. Therefore, the study's variables' reliability is deemed acceptable.

**Table 1. Comparison of alternative factor models.**

	Model	X <sup>2</sup>	df	CFI	RMSEA	SRMR	Δχ <sup>2</sup>	Δdf
1	5-factor (hypothesized model)	2075.136	809	0.304	0.182	0.158	-	-
2	3-factor	2216.686	816	0.252	0.189	0.162	141.55	7
3	1-factor	2316.848	819	0.200	0.195	0.168	100.162	3

### 5.3 Descriptive Statistics

The descriptive statistics of the contextual model of this paper are presented in Table 2. Across all variables, the study's sample scores the highest on PS and JP with a value of 7 and the lowest on WS with an estimate of 1.00. With respect to the variability of each factor, EI exhibits the least dispersion (SD = 0.589) and WS the widest spread around the mean (SD = 1.016). Furthermore, it is worth mentioning that the sample included observations scoring the maximum JP and lowest WS of the scale ranges. Lastly, the Pearson's coefficient indicates a strong association of EI with WB and JP, a moderate correlation of WB with JP, and no interrelations for WS.

**Table 2. Descriptive Statistics and Correlation Analysis of the study variables.**

Variables	Correlations				
	1	2	3	4	5
1. Emotional Intelligence	1.00				
2. Psychological Safety	0.268	1.00			
3. Work-related Stress	-0.048	0.116	1.00		
4. Well-being	0.546**	0.528**	-0.055	1.00	
5. Job Performance	0.473**	0.180	-0.046	0.295*	1.00
** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level					
Cronbach's Alpha	0.828	0.968	0.681	0.780	0.796
Mean	5.440	6.264	3.829	5.351	5.423
SD	0.589	0.980	1.016	0.620	0.663
Min., Max.	4.31, 6.81	3.00, 7.00	1.00, 6.20	4.00, 6.57	4.00, 7.00
Skewness	0.371	-1.996	-0.172	0.001	0.008
Kurtosis	-0.043	4.312	0.434	-0.392	0.343
Shapiro Wilk's test	W = 0.979, p = 0.529	W = 0.689, p < 0.01	W = 0.986, p = 0.844	W = 0.980, p = 0.572	W = 0.974, p = 0.353

### 5.4 Hypothesis Testing

Prior the linear modeling, the assumptions of linearity, homoscedasticity, normality, and independence have been checked. The results of the Shapiro Wilk statistic that was utilized to confirm normality are displayed in Table 2. To assess linearity,

independence, and equal variance visual validation was conducted for which the respective plots can be found in Appendix D. As EI, WB, and JP meet all four assumptions *Hypotheses 1* and 3 were assessed using Ordinary Least Squared (OLS) regression analysis.

To test *Hypothesis 1*, i.e., if WB is significantly predicted by EI, a simple linear regression analysis was conducted, with the results displayed in Table 3. The results of the model were statistically significant ( $F(3,44) = 8.573, p < .001$ ), indicating that EI explains 36.9% of the variation in WB. Furthermore, it was found that WB is significantly and positively predicted by EI ( $\beta = .632, p < .001$ ) – thus supporting *Hypothesis 1*.

**Table 3. Regression Analysis.**

Dependent Variable	Independent Variable	R <sup>2</sup>	F	$\beta$	t	p
Well-Being	Emotional Intelligence	0.369	8.573	0.632	4.527	<0.001
	Age			0.013	1.797	0.079
	Gender			-0.226	-1.390	0.171
Job Performance	Well-Being	0.132	3.412	0.310	2.083	0.042
	Age			-0.013	-1.519	0.136

To address *Hypothesis 2.1* and 2.2, examining the mediating function of PS and WS in the relationship of EI and WB, a 5000 bootstrapped sample parallel mediation analysis (Model 4) was conducted, in accordance with Hayes’s recommendation (Hayes, 2009), with results are displayed in Table 4. The direct effect of EI on WB was statistically significant ( $\beta = .451, t(44) = 3.724, p < .001$ ). Furthermore, the indirect effect of EI on WB through PS was significant with a magnitude of 0.1194 (95% CI: [0.003, 0.283]), supporting *Hypothesis 2.1*. However, the results did not support *Hypothesis 2.2*, no indirect effect through WS could be recorded, as the confidence interval included 0 ( $\beta = .0042, 95\%CI: [-0.054, 0.052]$ ). Hence, as these results showcase only a partial mediation through PS and none through WS, *Hypothesis 2.2* is rejected, and *Hypothesis 2.1* is accepted. Lastly, the mediation analysis controlled also for agile experience, however no significant effect was found ( $\beta = -0.0009, SE = 0.1224, t = -0.4373, p = 0.6641$ ).

**Table 4. Mediation Analysis.**

Effect	Coeff	SE	CI (95%)
Direct Effect	0.451	0.121	(0.207, 0.695)
Indirect Effect PS	0.1194	0.073	(0.0031, 0.2833)
Indirect Effect WS	0.0042	0.0244	(-0.0544, 0.052)
Total Effect	0.1235	0.0720	(0.0025, 0.2803)

It is worth highlighting the difference in the coefficients of the direct and indirect effects. The direct impact of EI on WB is 2.6 times larger than the indirect effect through PS. Although both exert a significant influence, the results suggest that the direct effect of EI is more dominating and decisive in contributing to WB, establishing PS as a partial mediator.

To test the presumed relationship between WB and JP of *Hypothesis 3*, OLS regression analysis was employed. The examination resulted in a statically significant model ( $F(2, 45) = 3.412, p = .042$ ), whereby 13.2% of the variation in JP was accounted to WB. Additionally, WB significantly and positively predicted JP ( $\beta = .310, p = .042$ ), providing sufficient evidence to support *Hypothesis 3*.

## 6. DISCUSSION

The aim of this research was to examine the influence of EI on the WB and JP of team members through the Agile socio-psychological factors WS and PS. To uncover the significance of EI for Agile team members the paper made use of the JDR theory to frame the different components and a time-lagged design to capture effects in their entirety. Firstly, the findings showcase the direct and positive effect of EI on WB, thereby confirming its conceptualization as a personal resource (Xanthopoulou et al., 2007). Furthermore, in alignment with prior literature, WB was found as a significant predictor of JP. Secondly, the results demonstrate PS serving as a positive mediator of the relationship between EI and WB, thus supporting the theorized role as a job resource in the Agile context. Lastly, WS shows to not be influenced by EI, neither affecting WB and conclusively not assuming the role of a job demand in this context. The following sections elaborate on the theoretical implications of this study in more depth and discuss the practical consequences. The interpretations and significances should be considered alongside the research limitations detailed in section 7.

### 6.1 Theoretical implications

#### 6.1.1 Emotional Intelligence as a Personal Resource and the Impact of WB on JP

The first theoretical contribution of this research is the determination of EI as a personal capability positively influencing team member WB in an Agile context. The quantitative results showcase that EI positively predicts team member WB. This is in line with past research providing evidence of EI's ability to promote WB in the educational environment and conventional teams (Mavroveli et al., 2007). Moreover, this relationship is consistent with the JDR theory, as EI presumes the function of a personal resource contributing to WB. However, this study's results not only confirm a positive impact of EI on WB but also demonstrate that this relationship holds true in the Agile setting and that this effect persists or develops over time, specifically in this instance over three weeks. Furthermore, the OLS analysis supported the proposed relationship between WB and JP. These findings are in line with established theories, such as happy-productive workers (Cropanzano & Wright, 2001), effort recovery (Meijman & Mulder, 1998), and self-determination (Deci & Ryan, 2000) models, which have primarily investigated the traditional occupational environment. Moreover, the observed importance of team member WB with regard to JP is consistent with the

Agile Manifesto principle that emphasizes providing individuals with the necessary environment and support (Beck et al., 2001). This study provides evidence that WB serves as a fundamental pillar for creating nurturing conditions, thereby facilitating sustained increases in performance over time.

#### 6.1.2 Psychological Safety as a mediating Job Resource

A further theoretical contribution of this paper is the clarification of PS's role as a mediator in the motivational process of the JDR model. The quantitative results revealed PS having a significant and positive intervening effect. These findings are in line with the theoretical notion of personal capacities enhancement of job resources in the JDR context (Xanthopoulou et al., 2007). Additionally, these results demonstrate the mediation of PS in the relationship between EI and WB also holds true in an Agile setting, extending its applicability beyond purely traditional teams (Harper & White, 2013). The necessity and benefit of PS in the Agile environment could be associated with the intensive interaction required between team members for self-management (Sharp & Robinson, 2010), which is also highlighted by the Manifesto's principle of efficient and effective communication and the value it places on individuals and interactions over processes or tools (Beck et al., 2001).

However, as highlighted previously PS is a partial mediator, it accounts only for a portion of the relationship between EI and WB. Nevertheless, the relevance of PS should not be disregarded but considered further alongside EI regarding the reciprocity of personal and job resources (Xanthopoulou et al., 2007). An environment that fosters open communication and is free of judgment might encourage individuals to be more expressive in their emotions and engage in interpersonal tension resolutions, ultimately leading to higher levels of WB. Furthermore, according to the EASI theory, emotional expression in socially appropriate circumstances e.g. psychological safe environments, has been found to stimulate behavioral responses in observers with the ability to understand these (Van Kleef, 2008), such as those high in EI. Therefore, it is put forward that members of Agile teams high in PS might be prone to display positive sentiments more frequently, thereby influencing the WB of their colleagues and over time affecting their emotional self-regulation.

#### 6.1.3 Work-Related Stress as a mediating Job Demand

The final theoretical contribution of this paper is concerned with the influence of EI on the WS aspect of the health impairment process. The results of the quantitative



analysis did not detect any effect of WS. The inconsequential effect of EI on WS might be indicative of a more subtle relationship than initially expected. Whereas EI might not directly influence the experienced levels of stress, it aids individuals in developing effective strategies to dampen its implications and increasing stress tolerance (Fteiha & Awwad, 2020). Furthermore, this paper considers EI holistically and does not account for the divergent functions of its subdimensions. Whereas the ability to manage one's own emotions and those of others might reduce experienced stress (Prakash et al., 2014), for example by limiting the occurrence of negative emotions such as anger, the capacity to identify or understand feelings would impact other individual characteristics. Not accounting for potential differences in subdimensions and considering merely the composite construct can result in aggregation bias. Consequently, this might lead to loss of information (Greco et al., 2018) and possibly a diluted understanding of EI's effects.

Furthermore, the findings are contradictory to past research on occupation stress, which clearly links strain to a deterioration in WB (Quick & Henderson, 2016). Moreover, this observation opposes the fundamental premise of job demands and the emerging role of personal resources inherent to the JDR theory. The absent influence of WS on WB might be suggestive that job crafting, the process in which individuals alter aspects of their occupation context in accordance with their skills and desires (Tims et al., 2013), might take place more extensively in an Agile setting than in traditional project management context. The autonomy of Agile team members might enable them to remove aspects that cause more strain than value in performing their activities preventing negative consequences e.g. assigning more time to design a rigid product feature rather than create unnecessary documentation. Such is facilitated through the methodology's emphasis on continuous improvement, whereby events e.g. sprint retrospective, empower team members to actively identify and mitigate occupational conditions deterring their success (Del Nuevo et al., 2011). A further aspect worth considering while interpreting these results is the Agile practice of self-management, which research alludes to the capability of stress avoidance (Meier et al., 2018). The inherent decision-making, planning, and operational autonomy can enable individuals to continuously deliver the expected outcomes at a sustainable pace (Hoda & Murugesan, 2016), avoiding the WB impairment of the team member.

## 6.2 Practical implications

This research offers several practical insights for organizations seeking to maximize the well-being and performance of their employees operating within Agile environments. Firstly, the positive linear relationship between EI and WB highlights the significance of the personal abilities of individuals in their professional experience. This emphasizes that organizational efforts to increase the well-being of the existing or future workforce should not only be directed toward optimizing the vocational environment but also in encouraging individuals to apply their emotional competencies. Moreover, these findings draw attention to the importance of the Agile practitioner's internal locus of control. Employees should recognize or be made aware that they possess internal skills, particularly EI, that can greatly impact their WB in a professional context. It is therefore recommended to offer members of Agile teams educational options to assess their social competencies and be presented with techniques to apply them in daily activities. Secondly, the significant positive relationship between WB on JP guides institutions on how to optimize the output of Agile team members. Whereas a wide variety of software products or professional development courses are promoted to organizations promising JP improvements, investments should be made toward enhancing individual welfare. Furthermore, these insights offer advice on how to address underperforming team members. Rather than exerting pressure on individuals, recognizing that a decrease in JP might be caused by a low degree of WB provides team leads, scrum masters, or POs with a compassionate perspective and measures to address the actual underlying troubles. Lastly, the identified mediation of the relationship between EI and WB through PS suggests that fostering a team climate in which individuals can freely engage in interpersonal risk-taking is beneficial in Agile teams. Considering these findings efforts towards improving the WB of team members should not be limited to the autonomy in shaping their daily tasks but also creating an environment that is free of repercussions for voicing opinions or constructive criticism between coworkers. Such could be achieved by embracing conversations around uncomfortable topics, organizing activities in which individuals of the Agile team can develop trusting rapports or promoting educational opportunities for communication.

## 7. LIMITATIONS AND FUTURE RESEARCH

This research provides insights into the role of EI as a personal resource in managing the occupational factors and influencing individual WB and JP. However, the findings should be interpreted while considering its limitations. While this study, by employing a time-lagged design, counterbalances the common method bias and establishes temporal precedence to uncover the influence of EI on the occupational environment (Podsakoff et al., 2011), it is adversely affected by the sample size's gradual decrease over time. Participant attrition, a common issue in research spanning over sustained periods (Barry, 2005), also affects this study. Consequently, the number of valid observations (48 out of a total of 71) raises concerns regarding statistical power, bias, and generalizability (Anderson & Vingrys, 2001). Moreover, the limited dataset impedes the validity and consistency assessment of the measurement model (Kyriazos, 2018). Even if well-established latent variable models have been utilized, revalidating these within the Agile context would solidify and strengthen the drawn inferences. Therefore, concerning future investigations concerned with similar research it is proposed to make use of a large sample to better validate the measurement instruments and bypass concerns of statistical power or generalizability. A further consideration is the study's sample's characteristics. Whereas the level of collected data provides an in-depth understanding of EI's effect on psycho-social factors in an Agile context and its contribution to team members WB and JP, it is relevant to highlight that it originates from a single Dutch organization operating in the financial service industry. The data source singularity raises the issue of applicability as organization or industry-specific conditions could hinder inferences of the entire population of Agile institutions. This is further accentuated by the methodology's implementation flexibility, as the Agile practice is customized according to a company's conditions to produce the expected benefits (Dikert et al., 2016). Moreover, a contemporaneous topic relevant to this study is the impact of national culture on the execution of Agile (Ayed et al., 2017), as countries or territories pose divergent values, beliefs, and behaviors it ultimately shapes occupational practices. Taking this into account future research aiming to further uncover these effects should diversify the study's sample to incorporate individuals or teams from different organizations, industries, and national cultures.

## **8. CONCLUSION**

The objective of this research was to determine whether the EI of Agile team members influences their well-being and job performance, considering the occupational psychosocial factors of work-related stress and psychological safety. The interaction between the individual-level elements was evaluated over nine weeks drawing upon the Job Demands-Resources theory. EI was found to sustainingly influence the well-being of Agile team members positively, and this subsequently had a positive effect on job performance. Concerning its impact on socio-psychological factors, work-related stress has shown no significance in determining well-being and was not influenced by EI. In contrast, psychological safety was found to mediate the relationship between EI and well-being over time positively. In conclusion, this research showcases the relevance of EI in cultivating a supportive occupational environment in which individuals engage in psychologically safe communication and experience high levels of well-being, ultimately leading to improved performance.

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## 10. APPENDIX

### A - Measurement of EI

Self -Emotions Appraisal	I have a good sense of why I have certain feelings most of the time
	I have a good understanding of my own emotions
	I really understand what I feel
	I always know whether or not I am happy
Others Emotion Appraisal	I always know my friends' emotions from their behavior
	I am a good observer of others' emotions
	I have a good understanding of the emotions of people around me
	I am sensitive to the feeling and emotions of others
Use of Emotions	I always set goals for myself and then try to best achieve them
	I always tell myself I am a competent person
	I am self-motivated person
	I would always encourage myself to try my best
Regulation of Emotions	I am able to control my temper and handle difficulty rationally
	I am quite capable of controlling my own emotions
	I can always calm down quickly when I am very angry
	I have a good control of my emotions

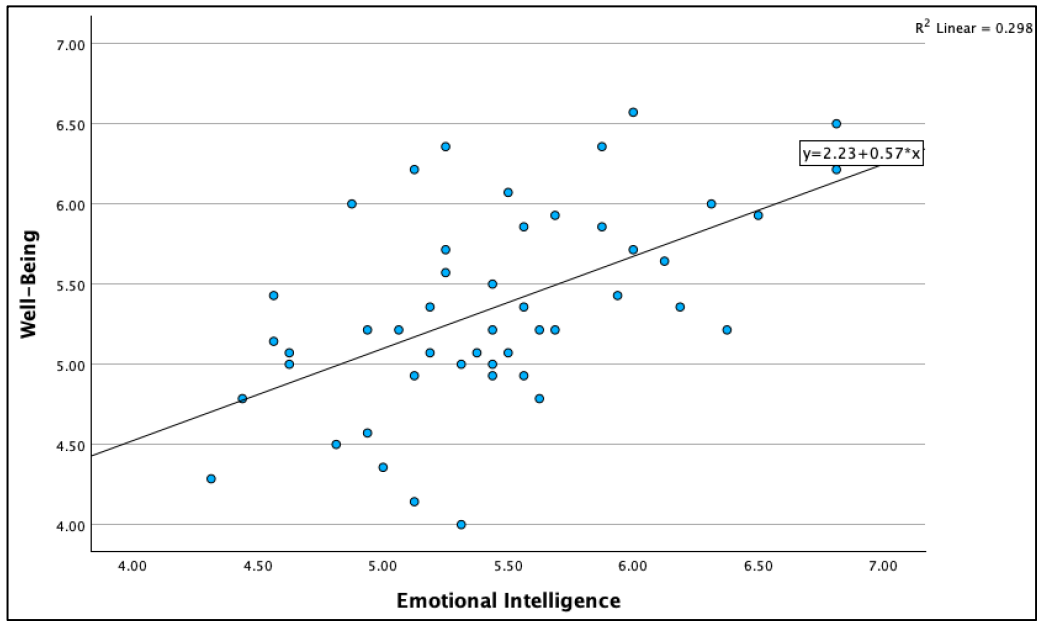
### B - Measurement of PS and WS

Psychological Safety	During the past meeting, it felt safe for me to make suggestions
	During the past meeting, it felt safe for me to give my opinion
	During the past meeting, it felt safe for me to speak up
Work related stress	My job is more stressful that I had ever imagined
	I fear the amount of stress in my job will make me physically ill
	I have to work fast in my job
	I have to work very intensively in my job
	I do not have enough time to finish everything in my job

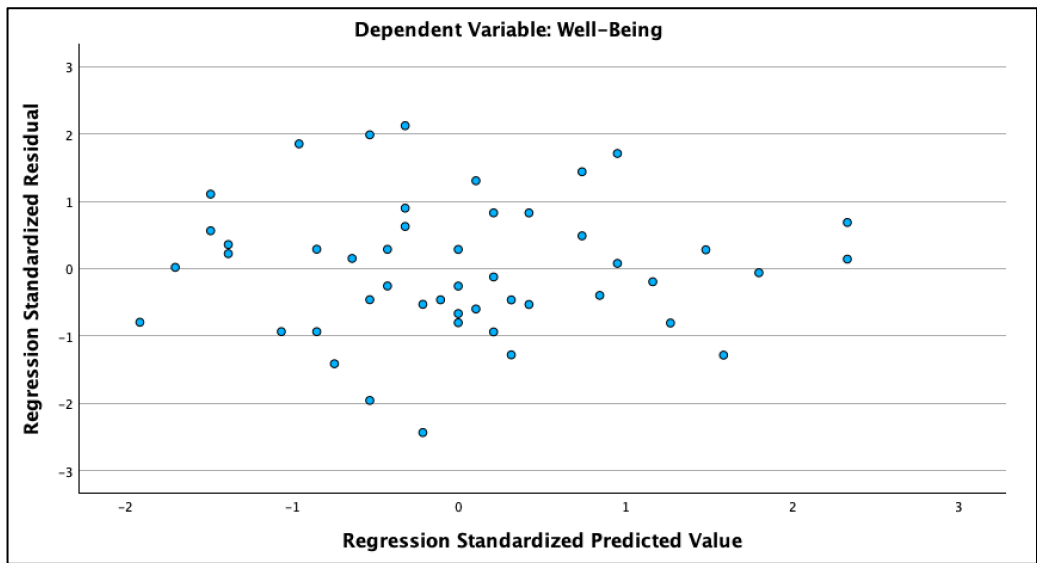
### C - Measurement of JP and WB

Job Performance	I am consistently high performing
	I am effective
	I make few mistakes
	I do high quality work
Well-Being	Inspired
	Nervous
	Alert
	Ashamed
	Enthusiastic
	Irritable
	Determined
	Scared
	Active
	Upset
	Interested
	Afraid
	Proud
	Attentive

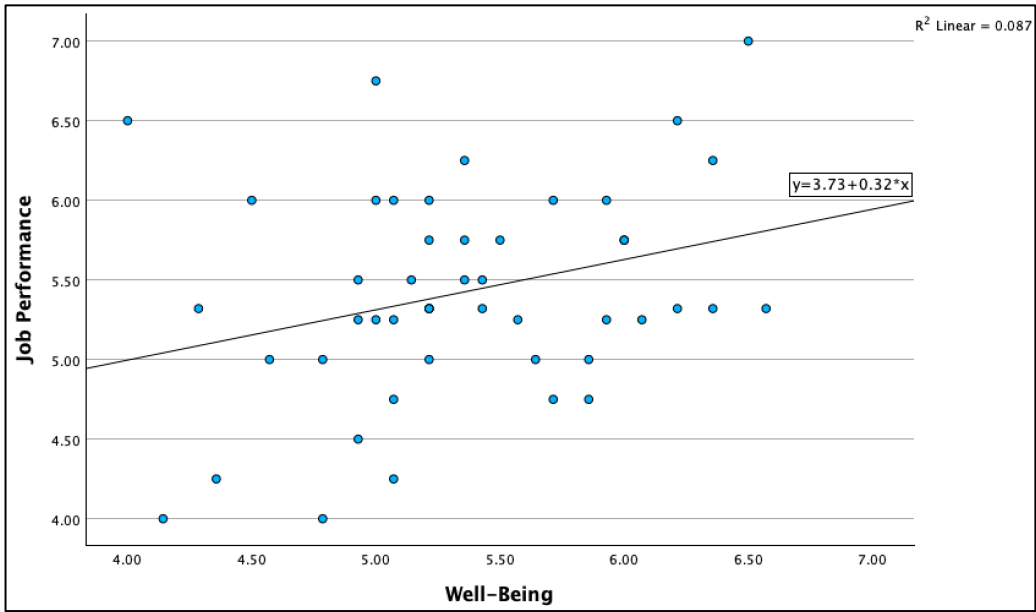
## D – Linear Regression Assumptions



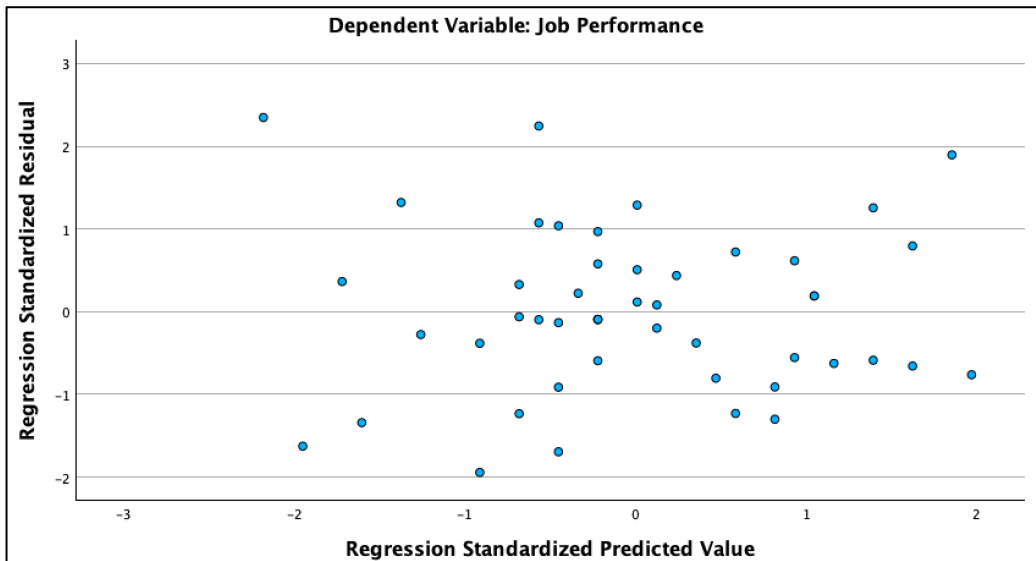
**Scatter Plot EI and WB**



**Residuals vs. Fitted Values Plot EI and WB**



**Scatter Plot WB and JP**



**Residuals vs. Fitted Values Plot WB and JP**