Positive Psychology and its Implications on the Twin Transition in Organizations: A Mixed-Method Study

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ABSTRACT

The twin transition i.e. moving to be more sustainable and digital in organizations can bring about various changes within the organizational structure and practices. The area of change management becomes more relevant as we face an ever-changing market dynamic. This study examines the role of positive psychology in facilitating openness to change. Utilizing the Job Demands-Resources model as a theoretical framework, this research investigates the relationships between the employee and leaders understandings of their respective organizations in the context of a twin transition. This research used a mixed-methods approach to get both qualitative and quantitative insights for a more holistic understanding of the relationships between the variables. Overall, the findings indicate that higher levels of psychological capital (PsyCap) in employees are strongly associated with a higher openness to change and better engagement with twin transition practices. Similarly the perceived PsyCap employees had of their leaders influences employee engagement levels with change practices. This highlights the importance of positive psychological resources in the context of an organization undergoing change such as the twin transition, and further discusses its implications.

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Keywords

Twin transition, positive psychology, psychological capital, leadership, change management, job demands-resources, mixed-methods research

1. INTRODUCTION

The term "twin transition" involves the merger of both digital and sustainability oriented transformations (Joint Research Centre, 2022). Along with the ever changing market dynamics, two main global predicaments have acted as a catalyst for the transformations; the pandemic with the digital side, and the increased call-to-action regarding worsening climate issues with the sustainability factor (Christmann et al., 2024; Diodato et al., 2023). Digitalization and digital transformation have been implemented more than sustainability in organizations (Christmann et al., 2024; Burinskienė & Nalivaikė, 2024). However, the topic of sustainability and sustainable practices is increasingly given more importance as a means of ensuring long-term success in organizational contexts (Bharti et al., 2022). The multidimensional perspective to sustainability holistically consists of environmental, social and economic aspects (Haugjord & Aanestad, 2023), which is also what is usually covered by corporate social responsibility (CSR) (Bharti et al., 2022) and referred to as the triple bottom line. With the investments into the twin transition i.e. the digital and sustainable transition, organizational change will likely have an impact on all three levels - organizational, functional, and individual (Diodato et al., 2023). Sustainability appears differently on these three levels, of which the synergies become a contributing factor of long-term success (Stoughton & Ludema, 2012). The interconnectedness of digital and sustainable transitions comes from digital enhancing sustainability transformations. This can be through positively influencing organizational effectiveness such as with new business processes, optimization, etc. (Grabl et al., 2022). For instance, digital transformation such as data optimizing or digital waste reduction, can act as an enablers for sustainable development by supporting smart technology or sustainable strategies, which heavily rely on accurate data (Grabl et al., 2022; Brenner & Hartl, 2021).

Digital and sustainable transformation within an organization would bring about significant change within the organizational culture. Managing and implementing the change i.e. the twin transition, would then be necessary to sustain this transformation (Burinskienė & Nalivaikė, 2024). Due to the nature of the digital transformation, the event of individuals' perception and resistance to the change must also be taken into account (Scholkmann, 2021). When dealing with change, it is known that positive emotional states allow for individuals to better adapt to uncertainty and better performance (Fredrickson & Branigan, 2011). The use and study of positive psychology has recently become an emerging theme in the organizational context, but research for its relationship with change management remains quite limited (Uyan & Aslan, 2019). Therefore, it may be worthwhile to further investigate how psychological capital (PsyCap), or positively charged behaviors within individuals can help organizations successfully reinforce the twin transition. The study of positive psychology – positive subjective experience, positive individual traits, and positive institutions – is developing, yet much more research is needed in this perspective to help build a knowledge base that can better improve work life quality and organizational effectiveness (Donaldson & Ko, 2002). Seeing as how leaders play a crucial role in change management and in giving direction to employee behavior (Musaigwa, 2023), it can be worthwhile to explore how their PsyCap can impact an organization underway with the twin transition. This research can then provide better insights that could help facilitate the implementation of the twin transition practices within organizations for a smoother shift with the least resistance. This would then also build onto research behind the dimension of social sustainability and its relationship with the digital transformation (Brenner & Hartl, 2022).

The successful implementation of the respective organizational change is significantly impacted by individual attitudes, and adoption of the new processes (Albrecht et al., 2020). PsyCap is a multidimensional collection of healthy psychological states – hope, efficacy, resilience, optimism (HERO) – that improve well-being and performance for both individuals and teams (Luthans & Broad, 2022). Just like how financial capital helps ensure the sustenance of a business, PsyCap can also aid long-term success by mitigating the stressors at work and improving mental health (American Psychological Association, 2023). Generally, employees who focus more on the positive sides have increased performance in their job satisfaction and effectiveness. A positive outlook on change involving HERO elements in the VUCA world can increase individuals' capacities to adjust to change, which can help organizations grow and achieve sustainable sustainability (Bharti et al., 2022). This research argues that high leader PsyCap is essential for employees going through change such as the twin transition, as it can boost resilience, mitigate stressors and shape their resource allocation (Zhu et al., 2023). In the context an organization undergoing a transformation, it can be of value to explore the following research question:

How do the principles of positive psychology contribute to leaders' openness to change in the context of an organization undergoing the twin transition?

With the sub questions of:

1. What role does an individual's PsyCap play in the twin transition?
2. How does leaders' PsyCap drive willingness to change towards the twin transition?

As shown in Figure 1 below, this research hypothesizes 1) that PsyCap has a positive correlation to openness to change, and 2) openness to change is positively correlated to the adoption of twin transition practices. This is based on the assumption that leaders who are more willing or open to change are more likely to actively undertake practices that foster the twin transition (Musaigwa, 2023).

Figure 1: Research Model
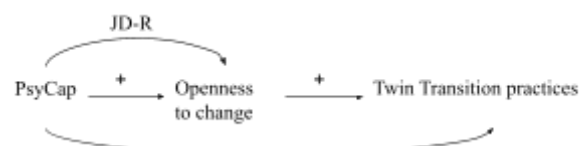
1.1 Theoretical and Practical Contributions

This research attempts to contribute to existing literature about the concept of the twin transition in organizational settings. It also brings in the perspective of positive psychology, more specifically a leader's PsyCap (Luthans & Youssef, 2004) and the role it plays in an organization's twin transition journey. The purpose of the paper was to conduct an exploratory study towards understanding how leader PsyCap can influence change processes that the twin transition brings, and employee behaviors towards the change. The paper utilizes the job demands-resources (JD-R) framework proposed by Bakker & Demerouti (2007) to better understand the impact of (personal) resources that include PsyCap, on perception of job demands and stress. All in all, it aims to contribute to the closure of the existing gap on the relationship between the twin transition

strategies in the context of change management (Grabl et al., 2022) with focus on employee engagement.

Practical implications for this research include providing an organization's human resource department, or managers with insights into implementing twin transition practices. By better understanding leaders' PsyCap and their relationship with employees, it can provide implications for change management strategies, leadership development training, and even strategies to improve employee engagement. By recognizing PsyCap as a personal resource in the JD-R framework (Bakker et al., 2007), the role of PsyCap in mitigating perceived stressors and enhancing performance becomes clearer. The research contributes to understanding organizational change in the context of the twin transition, with a focus on the contribution of positive psychology, leader PsyCap and employee engagement on achieving sustainable organizational processes. By exploring the relationship of positive psychology and organizational change, organizations can be encouraged to incorporate more well-being initiatives as part of their sustainability strategies, and in the end, provide a more holistic approach to the transition.

2. LITERATURE REVIEW
2.1 The Twin Transition

A successful twin transition involves the interplay and synergy between the two, digital and sustainable transitions and implementing driven governance mechanisms (Burinskienė & Nalivaikė, 2024). Organizations have more recently been emphasizing the importance of both transitions, which require the organization to continuously grow without ever reaching definable goals (Brenner & Hartl, 2022). However, properly used digital technologies can help an organization utilize their resources more efficiently, better adopt a circular economy and also get closer to climate-neutrality (Burinskienė & Nalivaikė, 2024) as part of an ongoing journey.

2.1.1 Digital Transformation

Digital transformation can be defined as "an organizational change process that improves an organization through digital technologies and may lead to profound changes in value creation and the organization's identity" (Christmann et al., 2024). It is mainly connected to the need for new technology usage as a means of staying competitive in the market for both online and offline goods and services (Mergel et al., 2019). These digital technologies have significant potential to combat the world's most challenging issues such as climate change, and resource depletion (Bohnsack et al., 2021). With improved digital technologies, and usage of them, organizations can increase productivity, streamline processes, cut costs and achieve higher revenue (Burinskienė & Nalivaikė, 2024). Digital transformation can significantly impact the sustainability components of an organization (Chandola, 2016), which combined, can provide organizations new methods of combating sustainability concerns.

2.1.2 Sustainability

Utilizing the definition from the United Nations, sustainable development can mean "an integrated approach that takes into consideration environmental concerns along with economic development". In a traditional view, sustainability has been viewed from the triple-bottom-line perspective i.e., people, planet, profit. However, sustainability in the context of a digital age goes beyond the traditional perspective, where it takes into account more values of ownership, data safety, and digital waste that brings the digital world together with the physical (Bohnsack et al., 2021). For sustainability to become a competitive part of the organizational process, it needs to become a part of the strategy (Liboni, 2017). Sustainability can involve transforming key business processes and activities to provide the organization with a competitive advantage that allows them to reach their objectives in a responsible manner, both socially and environmentally (Bharti et al., 2022). Corporate social responsibility and corporate citizenship have also been used as alternative terms to sustainability. This research aims to explore what relationship a leader's positive psychology has on the twin transition of an organization through the lens of change management.

2.2 Positive Psychology

Positive psychology can consist of various aspects, indicating psychological, social, and societal well-being (Park et al., 2014).What it all has in common, is that it focuses more on what goes well in life rather than just focusing on the negatives (Seligman & Csikszentmihalyi, 1970). The subjectivity of "good" and "bad" or "success" and "failure" calls for equally deserving attention. The idea of positive psychology is to go beyond the traditional "problem-focused" psychology that argues mental health is the absence of mental illness. The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." This also suggests that there is no health without mental health. Which is then defined by WHO as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community". This perspective aligns with the concept of positive psychology, which focuses on fostering positively associated psychological states, traits, and relationships that challenge the disease model (Park et al., 2014). The three pillars that encompass positive psychology (Peterson, 2006, as cited in Donaldson & Ko, 2009) are positive subjective experiences, positive traits, and positive institutions. A significant practice from this approach of solving problems is by the identification and support of individual and societal strengths (Michel et al., 2012). Organizations can utilize this approach to foster growth in a balanced way.

2.3 Organizational Context of Positive Psychology

Positive organizational scholarship (POS) is mainly the study of positive outcomes, processes and characteristics of organizations (Cameron et al., 2003). POS can be used to better understand how and why organizational strategies impact human behavior in the workplace, along with the extent of it. Positive organizational psychology (POP) is the study of how positive psychology can improve work, effectiveness and quality within organizations (Donaldson & Ko, 2009). According to Luthans (2002), positive organizational behavior (POB) is "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today's workplace". This definition of POB explicitly makes it a measurable criterion that can show a direct contribution to the organization, and thus be of value. A key differentiator of POB and positive psychology is the criteria for which it can be developed. Based on the definition, the make-up of POB are states that are open to learning, change, and management (e.g. through training and development programs) rather than dispositional traits. The main concepts of POB include hope, efficacy, resilience, and optimism (HERO) (Luthans, 2002). The umbrella that covers all three: POP, POB, and POS was termed as positive work and

organization (PWO) and encourages integration between them (Warren, Donaldson, & Luthans, 2017).

2.4 Psychological Capital

PWO contributes to the understanding of subjects such as psychological capital (PsyCap) (Donaldson et al., 2020). Based on POB, the HERO model is collectively known as PsyCap (Luthans & Youssef, 2004) and focuses on state-like conditions that can be developed in an organization's individuals through appropriate interventions and management. Just like any other kind of capital, PsyCap can also be used and assessed in terms of the impact it has on the organization's sustainable competitive advantage. Referred to as "an individual's positive psychological state of development," (Luthans and Youssef, 2007). More context to the components of PsyCap ('HERO') can be found in Appendix D, table 2. All individuals come with their own experiences from their social environment that continue to impact their hope, efficacy, resilience, and optimism. With this psychological dynamic, individuals can be seen as capital that is more flexible to changes and can be trained to cater to the change, rather than let the stressors negatively impact performance. Human capital has been shown to be universally valuable out of the many factors that may contribute to an organization's sustainable competitive advantage (Crook et al., 2011; Luthans et al., 2007). Positive PsyCap management can target individuals' capacities to best work with the conditions of the organization at the moment, in order to get the most efficient outcomes for a competitive advantage, in this case, of the twin transition (Luthans & Youssef, 2004). Those with high levels of PsyCap are able to utilize available resources (Hobfoll, 2002) and work towards their goals. High levels of PsyCap are also seen to have a positive relationship with both workplace performance (proactivity, adaptivity, proficiency) (Donaldson et al., 2020) and well-being on all levels of analysis (individual, team, and organizational), especially in dynamic and stressful environments (Luthans & Broad, 2022).

PsyCap as a collective, as well as its individual components have been studied to contribute to high performance, work engagement, team cohesion, and more (Donaldson et al., 2020; Donaldson & Ko, 2010). It is a predictor that can be utilized by human resource managers in a dynamic environment, such as an organization undergoing the twin transition, since it directly influences perceptions of job demands and resources (Grover et al., 2018) through the change. The personal resource of PsyCap can allow for individuals to influence the job (demands, resources, outcomes) (Grover et al., 2018) by being a contributing factor to perception of the change.

2.5 Openness to Change

2.5.1 Organizational change

The twin transition poses as an organizational change (Christmann et al., 2024) that organizations must take into account when implementing the practices or changes that it may bring. Organizational change can be of people, process, or structure related (Beal et al., 2013). People-oriented change is more about how the change would impact employee behaviors, skills and performance, which can all be learnt. Process-oriented change is more about productivity in the organizational performance, and about how changes are implemented on the different levels of an organization. Structural change also includes the relationships between organizational components, hierarchy and the management system involved in the change. People's involvement with the change processes are closely related to their reactions towards the change (Khaw et al., 2022). When studying organizational change, resistance and readiness are considered as different concepts that go together. Removing resistance to change may facilitate readiness to change, not guarantee it (Uyan & Aslan, 2019).

Kotter and Schlesinger's (1989) strategies to reduce resistance to change i.e. education and communication, participation and involvement, facilitation and support, negotiation and agreement, manipulation and co-optation, explicit and implicit coercion, all are effective in the sense that they allow for readiness to change.With higher readiness to change, there are more efforts taken to adopt the change more effectively (Armenakis et al., 1993). When implementing a change, such as the twin transition, readiness to change should be considered as a facilitator. A positive attitude towards change, such as readiness, has been seen to have a positive correlation with positive behavioral results such as job satisfaction, system use, and more, which is also supported by the change engagement model (CEM) (Albrecht et al., 2020). Leaders as an internal change agent also play a significant role in directing and managing the change process (Mangundjaya, 2013) that can be a result of the twin transition.

2.5.2 Change Climate, Process, and Readiness

For the purpose of this study in investigating openness to change, the research by Bouckenooghe et al. (2009) was used, which involved three components of change – Climate, Process, and Readiness. All three together made up the Organizational Change Questionnaire that was designed, and also used in this study in the distributed survey (more in the Methodology section of this report). Change climate would refer to the organizational culture and environment which would have an impact on how employees perceive change. A positive change climate would be favorable and allow for a smoother implementation of change processes. The component of change processes includes the actual procedures carried out during the implementation of change. This could include how change was communicated, planned, and executed by management. Lastly, change readiness was based more on the individual and their perceived preparedness for the change, including the willingness and ability to adapt to the changes. The OCQ and openness to change was used as a mediating variable between PsyCap and the Twin Transition.

2.5.3 Leaders and Positive Psychology

PsyCap is a significant external factor that can impact employee behaviors that are change-related (Norman et al., 2010). The leader in the context of organizations undergoing the twin transition can be referred to as the decision maker or change facilitator (e.g. management, leader in sustainability, etc.). Leader PsyCap can impact employee PsyCap by influencing how they are supported with their time, attention, and resources (Zhu et al., 2023). Leadership can strengthen the structural and cultural characteristics of an organization towards sustainability, by making use of employee engagement and alignment with corporate governance (Grabl et al., 2022). Studies have provided insights into the potential PsyCap has when dealing with stressful events such as organizational change (Liu, 2021; Avey & Luthans, 2009). Both leadership and PsyCap suggest that they can encourage employees creativity, which can boost organizational effectiveness and help find solutions when faced with challenges (Rego et al., 2012). Followers (those following the leaders, can also be referred to as employees) openness to change can help them see change as a chance to grow and utilize positive change-related behaviors (Liu, 2021), with positive impacts of the leader to follower PsyCap further facilitating these behaviors (Zhu et al., 2023; Armenakis et al., 1993). Individuals with higher levels of PsyCap are seen to

display fewer change-resistant behaviors with the moderating effect of organizational identity (Normal et al., 2010), and leaders with a high PsyCap can act as leverage for the entire team. Leader PsyCap can have an impact on employees' perceived job demands and resources, which can further shape their change-related behavior (Grover et al., 2018).

3. THEORETICAL FRAMEWORK

The job demands and resources (JD-R) model proposes that job demands act as stressors (e.g. time pressure, workload, etc.) that lead to burnout, and that job resources are the positives that encourage individuals achieve goals (e.g. autonomy, strong working relationships, mentoring, etc.) (Bakker & Demerouti, 2016). It suggests that when job demands are high, and when job resources are low then stress and burnout in individuals increase. Personal resources of an individual may act as any other job resources in the model, which would affect how they see the demands too.

Figure 2: JD-R model of work engagement (Bakker et al., 2007)
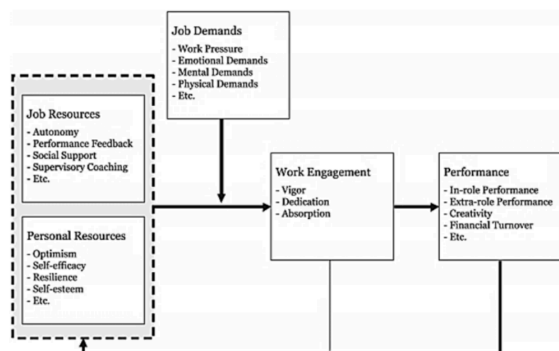
The JD-R model of work engagement (Figure 2) by Bakker et al. (2007) shows personal resources along with job resources can provide stress-mitigating strategies. The JD-R model has been applied in various organizational contexts also involving employee well-being and PsyCap (Leserner et al., 2020; Grover et al., 2018). The twin transition can be seen as a significant change in the organization's environment. Small and medium-sized enterprises (SMEs) may face more hurdles in obtaining required investments and technologies for the transition, as compared to larger firms that have a larger access to resources (Diodato et al., 2023) that can cater to the change. Job resources significantly contribute to fostering work engagement (Bakker et al., 2007), and have shown potential to act as a buffer against high job demands (Bakker et al., 2005). Modification in work design due to the processes of the twin transition can signify changes in a job's demands and resources, which may negatively impact employee engagement (Van Steenbergen et al., 2017). Various studies have studied PsyCap as a personal job resource (Xanthopoulou et al., 2007), as job resources function utilizing a motivational process that helps employees achieve goals and foster engagement (Grover et al., 2018). The study by Grover et al., (2018) suggests that PsyCap has a direct influence on employees perception of demands, and also the outcomes of engagement. Additionally, it also suggests "that job demands and resources mediate the relation of PsyCap with well-being and engagement respectively" (Grover et al., 2018). Job demands can be defined as physical, social, or organizational aspects that require effort to meet, and are therefore associated with stressors (Bakker et al., 2007; Leserner et al., 2020). Adopting organizational practices to cater to the twin transition can thus be considered as a job demand. Whereas job resources can be defined as more

positively valued physical, social, psychological, or organizational aspects that contribute in goal-attainment, stimulating engagement and effective performance (Bakker et al., 2007; Leserner et al., 2020). As based on aforementioned literature, PsyCap as a positive contributor to change will be considered as a personal job resource. Based on the JD-R model, work engagement could then be a measure of employee response to change that the transition brings, and performance would be the adoption of twin transition practices.

Based on the theoretical framework, literature on PsyCap and organizational change, the following hypothesis were made:

H1: PsyCap has a positive correlation to openness to change, H2: Openness to change is positively correlated to the adoption of twin transition practices.

4. METHODOLOGY
4.1 Research Design

The aim of this research was to explore the relationship leader PsyCap has with response to change and the adoption of twin transition practices. To investigate this topic, abductive mixed-methods research (MMR) involving a questionnaire and semi-structured interviews was conducted. The MMR approach emerged due to the complex nature of research problems, acceptability of data, and the need to generalize findings, and is now an institutionalized approach in the field of social sciences (Timans et al., 2019). MMR involves the research integrating aspects of both qualitative and quantitative research methodologies throughout the study (i.e. data collection, analysis) as a means of achieving a comprehensive understanding of the findings (Johnson et al., 2007). The interviews conducted with leaders of the organizations were considered qualitative data, which also provided insights that supported the quantitative data that was collected through the questionnaires on PsyCap and response to change. Due to the abductive nature of the study with limited observations from the theoretical framework, the mixed methods approach provided more context for the findings.

Prior to conducting the semi-structured interviews that included the questionnaires, ethical approval was requested for and granted by the Ethics Committee of Behavioral, Management, and Social Sciences (BMS) at the University of Twente.

4.2 Data Collection and Sampling Methodology

For the study, seven leaders, who were c-level executives in organizations were selected. It was assumed that by interviewing leaders of organizations, the most relevant and appropriate qualitative insights that represent the company's position regarding the twin transition could be collected. The leaders that were interviewed were part of an organization that is attempting to be oriented towards sustainability, and is looking to develop themselves further towards the twin transition. Although in this study, it was only the leaders responding to the questionnaire, their responses also provided indication as to the organization's position throughout the change.

To gather the participants for the study, the researcher attended the GreenTech Festival (GTF) in Berlin. GTF is a global platform that encourages individuals and organizations driving change towards a more sustainable future, and the "mission to net zero" (GTF Berlin, 2024). The GTF invites attendees that foster a collaborative environment between individuals, companies, and ideas that are committed for a greener future.

Throughout the duration of the festival, five speakers (leaders in sustainability) and 20 exhibiting companies were asked to participate in the study. The initial plan was to gather data and interviews during the festival, however, this turned out to be an inconvenient time for the multiple parties involved. Therefore, conducting the interviews at that moment was not possible. The setback was not previously accounted for. In order to try and remain on track with the timeline of the research, the researcher sent out messages via LinkedIn and email further elaborating on the study and asking for availability. Due to the limited timeframe in collecting data, a LinkedIn post along with individual messages to connections were sent out asking for their support in the study. In the messages sent out, leaders were also asked to distribute the survey among their employees to get more in-depth insights into the relationships between leaders, employees, change, and the twin transition in a company. However, some companies had concerns with the legalities and approval process of the questionnaire, as it would have to be internally approved to be sent out first. This procedure was inconvenient, and hence, they opted out of the study. Out of the ~40 total messages sent out, 10 positive responses were received. However, due to the leaders limited availability, three of them were unavailable during the designated data-collecting timeframe. Therefore, a total of seven leaders of organizations were selected to have semi-structured interviews, along with a questionnaire to get mixed-methods of qualitative and quantitative data. The small sample of seven leaders in sustainability acted as the representative for their respective industry. This sampling method was convenience sampling based on the availability of leaders during the festival and those who responded to the individually sent out messages, (Lee & Landers, 2022) which came with risks of difficulties in generalizing results to a larger data set.

As part of the semi-structured interviews, respondents were asked to answer a questionnaire with sections in which the answers would indicate PsyCap levels, response to change levels, and their insights into the digitalization and sustainability practices within their respective organizations. Depending on the organization, the context of the "twin transition" can differ, and so getting a mixed qualitative and quantitative results could provide more explanation to support the research. Semi-structured interviews can provide a more extensive output as it lets interviewees further share or elaborate on their feelings towards the twin transition or any question asked (Carruthers, 1990). Semi-structured interviews can provide more flexibility and adaptability to both the interviewer and interviewee to engage in a more natural flowing conversation, while leaving room to return to questions as needed (Adeoye-Olatunde & Olenik, 2021). The interview lengths ranged between 25-50 minutes, depending on the interview length and the interviewees availability. Whereas for qualitative data, questionnaires were designed to measure PsyCap, organizational change (Bouckenooghe et al., 2009), and the individuals' understanding of the level of twin transition in their respective organization. The employees and leaders were given separate questionnaires, with the difference being that employees were additionally asked to fill in how they perceive their leaders PsyCap.

Table 3: Overview of Leaders Interviewed

This self-reported questionnaire included Likert-scale like items that were the Psychological Capital Questionnaire (PCQ) proposed by Luthans et al. (2007) (Appendix B), and the Organizational Change Questionnaire - Climate of Change, Processes, and Readiness (OCQ-C,P,R) as developed by Bouckenooghe et al., (2009) (Appendix C). With this type of scale questions, a way to measure constructs that cannot simply be observed (Jebb et al., 2021) is found. By using quantitative measure, this data can then be systematically assessed, and allow for the researcher to identify correlations between variables (Williamson & Johanson, 2017). In combination, both the qualitative and quantitative data can provide possible trends and complementary insights derived from the data analysis. To attempt and mitigate this effect, the leaders who were interviewed were asked to provide examples where possible, as a means of getting real-world application and implementation within their company. Similarly, the social desirability bias may be present even in both the leader and employee surveys, as the respondents could feel the need to present the organization they are a part of in a more positive manner. To try and limit this effect, all respondents were made aware that the responses would be kept confidential, so they could try and answer as truthfully as possible. The summary of the type of data that was collected and measured can be found in Appendix D.

Since the data collected was directly from the leaders (overview in Table 3) in organizations themselves, the data can be said to be reliable. This is because the leaders acted as representatives for the organization, and provided first-hand knowledge on the themes of sustainability, and digital transformation practices or implementation. It must be taken into account that this data could be subject to the social desirability bias (Fisher, 1993), in which the leaders may have provided answers that made them and their respective organization appear more socially desirable to the researcher.

4.2 Research Instruments

The seven semi-structured interviews were conducted online. Three of them were on a phone-call, which was more convenient to the interviewee, and the other four were conducted via Microsoft Teams. The interviewees provided written consent online, were asked for consent to be recorded, and for the data that was collected to be used for the purposes of this research. The interview guide (see Appendix A) was used during the interviews with leaders in sustainability, and to get their insights on digital transformation (Mergel et al., 2019) and sustainable transformation (Picard & Manfredi, 2024) in the context of their own organization. The initial questions were to get some background information on them, their role, and the company that they work in. The following questions loosely followed the structure of the guide to get real-life examples and insights from them. It was important to note that the term "twin transition" may have been unfamiliar to some interviewees, and thus were explained using the definition provided by JRC (2022); "the twin transition is the process by which sustainable and digital transformation support each other and take place in parallel". The interviews were closed off with an ending note, which also expressed appreciation for the participation in the research, and served as an open space for any questions they may have had.

Participant	Function Title	Gender	Age	Industry	Firm Size
P1	Owner & CEO	Male	49	Engineering, manufacturing, and construction	Medium >100
P2	CEO	Male	48	Scrap Trading	Large >300
P3	Managing Director	Male	54	Construction	Medium >100
P4	President & CEO	Male	32	Agriculture	Medium >100
P5	Owner & CEO	Male	46	Scrap Trading	Medium >100
P6	Deputy Head	Female	49	International Organization	Large >300
P7	Deputy CEO	Female	28	Engineering Production	Large >300

For the quantitative data, the 24-item PCQ (Luthans et al. 2007) was used to measure the PsyCap in the leaders being interviewed, with each component of 'HERO' being assessed with six components (Appendix B). The PCQ was also present in the employee survey, and used to measure individual employee PsyCap. The PCQ was slightly modified to fit the context of employees answering what they perceive their leaders PsyCap to be. In the modified PCQ, the term "manager" was used instead of "leader" to signify the person with higher managerial power above the junior/management-level employee. For example, when employees were asked to indicate how they perceive their manager's PsyCap to be, the item looked like the following: "My manager can usually handle whatever comes their way".

The second set of questions in both surveys to the leaders and employees was the OCQ-C,P,R (Bouckenooghe et al., 2009). This questionnaire had 42 items in total (see Appendix C), with 18 for climate, 15 for processes, and 9 for readiness. While both questionnaires utilized a 5-point likert scale ranging from strongly disagree (1) to strongly agree (5), the employees were given a sixth option for "I don't know" when answering about their perception of leader PsyCap, as well as for the areas of change climate and process. This was done to lower the burden on the employee survey takers, and encourage them to respond despite potentially not knowing or being aware of the organizational decisions being made. Lastly, there were four questions in the format of a 5-point Likert-scale as well, regarding the employee or leader's understanding of the twin transition level in the company. These were created by the researcher as a means of getting an overview of real-time insights into the company's position in the twin transition, as it is a phenomenon that has only recently been studied. The full survey for both the leaders and employees can be found in the links in Appendix A.

4.3 Data Analysis

The qualitative data that was obtained from the interviews was thematically assessed to identify patterns, and relationships that are connected to PsyCap and response to change (climate, process, and readiness) in the context of the twin transition in organizations among leaders. With the use of thematic analysis (TA) through software such as Atlas.ti, repeated patterns or "themes" can be identified from the dataset (Braun & Clarke, 2006), and it is commonly used within fields of social sciences. The recorded data from the interviews was transcribed, cleaned, and coded to provide an overview of the themes that occur in relation to the research question. The interview data was structured using the Gioia Method (Gioia et al., 2012) under the terminology of first-order concepts, second-order themes, and aggregate dimensions. First-order concepts were derived from what the participants were saying (e.g. mentioning examples, such as "*I'm very excited about all the things, all the new things and changes because I can see the potential*"(P7)) which would be the supporting example for the code of "*Enthusiasm and personal commitment*". Whereas the second-order themes were connecting first-order concepts to the sub-section elements of the research (e.g. *Optimism*). Finally, with putting together relevant second-order themes, the aggregate dimension (e.g. *PsyCap*) could be formed. The overview of the structured data can be found in Appendix E.

As for quantitative analysis of the survey responses for both the leaders and the employees, descriptive statistics were conducted via Microsoft Excel. Utilizing the 5-point Likert scale items, scores were calculated for PsyCap, perceived leader PsyCap (employees only), change climate, process, readiness, total

response to change, and understanding of twin transition practices with the organization. The descriptive statistics included calculating the mean, median, mode, standard deviation of the above mentioned data. The employee data was then categorized per leader and organization (e.g. employee respondents from Company 1 were sorted with Participant 1). With this, the relationship between all the PsyCap levels, responses to change, and twin transition practices per organization could be better visualized and understood. Qualitative insights from the interviews were then also used as supporting material to strengthen the quantitative data collected via the surveys.

5. RESULTS

The purpose of this research was to explore "How do the principles of positive psychology contribute to leaders' openness to change in the context of an organization undergoing the twin transition?" With the sub questions of: (1) What role does an individual's PsyCap play in the twin transition? and (2) How does leaders' PsyCap drive willingness to change towards the twin transition? The concepts of "PsyCap," "Openness to change," and "Twin Transition practices" serve as the aggregate dimensions that were explored and reached using first-order concepts and second-order themes as seen in Appendix D. The model (Figure 3) builds on to the initial research model (Figure 1) by having added the second-order themes from the analysis conducted on the interview data.

Figure 3: Conceptual Model
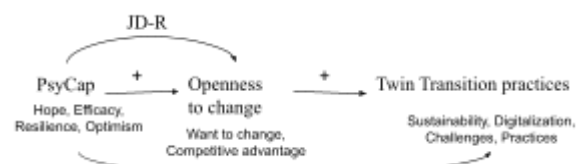
Essentially, what was being explored was the relationship between the twin transition in an organization, and leader PsyCap levels, with openness to change as a mediating variable. The relationship between PsyCap and openness to change was measured by the quantitative survey using the PCQ and the OCQ-C,P,R. The relationship between openness to change and the twin transition was mainly based on data from the interviews conducted with leaders. An indication of twin transition (organizational position, future outlook, implementation processes, etc.) and how it looks in the company was gathered from the interviews, with the four supporting quantitative datasets as well to obtain a bigger picture. This gave an idea about the leaders perception of the stance of the company and its employees, as well as the whether indicated PsyCap levels by the leader were perceived accurately by employees too.

5.1 Qualitative Data

5.1.1. PsyCap

Through the interviews, the HERO components of PsyCap (Hope, Efficacy, Resilience, Optimism) reflected the leaders' positive outlook towards change. These factors were more implicitly mentioned than as compared to digitalization practices, for example. When it comes to hope, Participant 4 (P4, from Company 4, C4) stated "*That is what we hope for*"

when talking about being able to reflect the importance of sustainability practices onto their employees, P3 stated "w*e hope that our employees will continue to ease into the change process...*", and P7 said "I *hope we can do it, but it is going to take time*" along with emphasizing their vision, "*I hope, until we are like 800 employees, we can manage with the same staff but more effectively with the new software*". The expressions of hope demonstrate how the positive expectations of the leaders can help foster a supportive environment for being open to change. According to the JD-R model, personal resources such as hope can be motivational drivers that enhance an individual's potential to handle demands more effectively. Efficiency was more challenging to measure, so it was implied using the concepts such as confidence to do something, performance by digitalization, collaboration, and growth. Examples that support efficiency and improve employee capabilities include "*We've had positive experiences with algorithms helping our people do their jobs better,*" (P2) and "*enabling us to offer predictive maintenance services to our clients*" (P3). With a higher efficacy, leaders can better instill confidence in their employees, which can promote readiness to change. Basing this on the JD-R model, efficacy can enhance employees' beliefs in their capacity, which can reduce perceived demands. Resilience was based on the drive to move forward despite any challenges that may come. This is further supported by examples such as "*we aim to navigate the transition process successfully and emerge stronger and more resilient as a result*" (P3), "*adoption requires careful planning, implementation, and adjustment over time, which also requires a resilient culture*" (P1) and "*we managed to stay alive and strong*" (P4) in context to the COVID-19 pandemic. The resilience of the leaders can have an impact on how the employees perceive stability, and in turn their ability to adapt to possible changes introduced in the organization. Optimism was mentioned and sometimes overlapped with the concept of hope. P7 stated "*If I say that 100% is the great ideal goal that you want to achieve, I think we are really at our 60-70%. I think I'm optimistic*" when discussing practices in the organization, and "*Change can be challenging, but I look at it optimistically*" (P3) that shows the leaders trying to have a positive belief about the future turn of events. This optimism of leaders can be translated into a positive organizational climate which can foster employees to be more receptive to change and the twin transition practices. When connecting resilience and hope to the JD-R model, these components can help individuals better combat setbacks, manage performance under stress and maintain a positive outlook that can foster a more change-ready organizational environment.

5.1.2 Openness to Change

Openness to change was mainly looked at through the leaders wanting to change and seeing change as a competitive advantage as it can motivate them to pursue the change. For example, P4 mentioned "*questioning the necessity of printing documents on single-sided pages instead of double-sided*" as a means of trying to bring about a cultural mindset shift in the employees. P1 also stated that "*Ultimately, change is a journey and a process like the transition, and we would like to support our employees as they are what keeps the company running at the end of the day*" and "*in the legislative area, we help countries improve their laws*" (P6) which all show the in-build desire to support and grow towards the change. P3 also expanded on the idea that once employees understand the reasons behind the change, they would more likely also want to change by saying "*Once they understand the reason behind the changes and see the potential benefits, they become more receptive and engaged*". Employees are more likely to be receptive to twin transition practices when they see their leaders

supporting it. This indicates that the role of the leaders in advocating and managing change is crucial. Change was also seen as a means to gain a competitive edge in the market. P5 placed greater importance on this by suggesting that "*It's better to do it faster for a better position in the market, even if it costs a lot now*" when discussing the digitization process of the organization. P1 supported this by saying that "*we're not only enhancing our efficiency and competitiveness but also driving positive environmental outcomes*" and P2 saying that they "*aim to avoid unnecessary truck runs… optimizing fuel usage and reducing costs and emissions*" that further builds onto the leaders desire to bring change, also because it helps them minimize unnecessary costs. The proactive approach of the leaders in achieving this competitive edge shows how it can drive organizations towards success in the context of a twin transition.

5.1.3 Twin Transition

When looking at the overall twin transition, themes such as sustainability, digitalization, challenges and practices were looked at. Many leaders agreed with the importance of the twin transition, and supported it. P3 for example mentioned that "*comprehensive training programs have been rolled out to upskill our workforce in digital technologies and sustainability practices, ensuring that everyone has the knowledge and tools needed,*" and P1 said "*we've implemented monitoring systems to track how much we're consuming and using, and actively work to decrease waste wherever possible. Not only does this help our wallet, but it also reduces our environmental impact by minimizing the need for additional production, especially of the chemicals…the digital transformation will allow us to collect data and analyze them. Thanks to those analyses we could be more efficient in our technology such as by using less electricity, less chemicals, less water, better planification of the production and so on. So basically, it is quite difficult to be sustainable without being digital.*" P2 also agreed and expanded from their side that "*if you want to assess whether what we're doing is sustainable or not, yeah, we need a lot of data and the data has got to be collected at different data points where we're not collecting it today.*" P5 also further added that the "*moving together sustainably and digitally, is a challenge. Sustainability includes reducing waste, clean water, and other UN goals. Digitizing the company is difficult and expensive. However, it is a good opportunity to be better in the market compared to other companies*" and P6 added "*I think it makes sense to look at them together because they complement each other. Digitalization reduces paperwork, making work more efficient, which also supports sustainability. They should be presented together to maximize benefits.*" Practices such as training programs, monitoring systems, new software, etc. indicate a culture of continuous improvement that was cultivated by the leaders. Leaders that place importance on these resources enable them to better handle transitions. Overall, leaders seemed to believe that sustainable and digital transitions go hand in hand, but they each come with their own challenges. The general idea was to move towards a sustainable future, try to support change and mindset shifts within the company, and actualize it. Despite being aware of the difficulties associated with the twin transition, leaders also recognized it as an opportunity. This perspective emphasizes the importance of their positive outlook when faced with challenges of the transition. The JD-R model underscores that personal resources such as PsyCap can help leaders better manage job demands and change effectively.

	Mean	SD	1	2	3	4	5	6	7
1 Employee PsyCap	3,88	0,21	-						
2 Perceieved Leader PsyCap	4,00	0,22	0,24	-					
3 Actual Leader PsyCap	3,91	0,29	-0,33	-0,28	-				
4 E*-OC	3,81	0,27	**0,58**	**0,78**	-0,29	-			
5 L*-OC	3,96	0,23	0,27	0,02	-0,23	-0,33	-		
6 E-TT	3,89	0,49	**0,44**	**0,51**	0,08	**0,56**	0,03	-	
7 L-TT	3,50	0,48	-0,28	0,38	-0,04	-0,21	**0,54**	0,18	-

Key   E* = Employee   OC = Openness to Change
              L* = Leader   TT = Twin Transition Practices

Table 4: Means, Standard Deviation, and Correlation of Variables

5.2 Quantitative Data

While the qualitative data provided confirmation of the presence of the variables in the model, a quantitative analysis was conducted to get better insights of the relationships between them. Utilizing the data gathered from the surveys (Appendix F), the means, standard deviations, and correlations between the variables were calculated (Table 4 above). These correlations provide insight to the key relationships (in bold) between the variables.

5.2.1 PsyCap

In order to get an overview of how PsyCap levels were, employee PsyCap, perceived leader PsyCap, and actual leader PsyCap were observed. For each company, the means of employee PsyCap, perceived leader PsyCap, and actual leader PsyCap were calculated. Employee PsyCap and perceived leader PsyCap that employees filled out are means of the employees that responded to the surveys.

Based on the means of the data, correlation was calculated to observe whether there is a relationship between the variables. There is a wear positive correlation (R=0.24) between Employee PsyCap and Perceived Leader PsyCap. This suggests that employees with higher PsyCap perceive their leaders more positively. However, Employee PsyCap and Leader PsyCap had a negative correlation (R=-0.33) which suggests that as one value increases, the other one decreases. Based on prior literature, this appears to be counter-intuitive as a positive correlation would have been expected. The Employee PsyCap scores range from 3.54 (C4) to 4.12 (C5), with the mean of 3.88 across all seven companies. This suggests that employees generally have a moderately high level of PsyCap when out of a 5-point scale. The Perceived Leader PsyCap had a mean of 4.00. This suggests that employees generally perceive their leaders as having high levels of PsyCap. The correlation between Perceived Leader PsyCap and Actual Leader PsyCap was a weak negative relationship (R=-0.28), which indicated the slight disconnect in how employees perceive leaders and the leaders' self assessments. The Actual Leader PsyCap scores had a mean of 3.91, also suggesting that leaders rate themselves with a relatively higher level of PsyCap. In all companies except C7, employees perceive their leaders PsyCap to be higher than their own, which could mean that they look up to their leaders with greater positive capital as a resource. There are differences between perceived leader PsyCap and actual leader PsyCap, e.g. in C4, employees perceive their leader's PsyCap to be significantly lower than the reported PsyCap levels by the leader. On the other hand, in C2 for instance, employees perceive their leader PsyCap to be significantly higher than the leader's reported levels.

The variables Employee PsyCap and Employee Openness to Change had a strong positive correlation (R=0.58). The positive correlation suggests that employees with higher PsyCap levels are more open and receptive to organizational changes. This finding supports the JD-R theoretical model that advocates for PsyCap enhancing one's adaptability to any changes that may be implemented in context of the twin transition. Perceived Leader PsyCap and Employee Openness to Change had a very strong positive correlation (R=0.78), this suggests that when employees perceive their leaders to have high PsyCap levels, they seem to be significantly more open to change.

5.2.2 Openness to Change

Based on the OCQ-C, P, R component in the survey, means per company were calculated for both the employees and the leaders that participated. "E" represents employees, "L" for leader data, and "OC" for total mean of Climate, Process, and Readiness results. For the total OC, the mean of the mean was taken to equally distribute the weights of the three components. While there were some slight discrepancies between employee and leader perceptions of organizational change across change climate, process, and readiness, it can be observed that generally, leaders see change in a more positive light and are more open to it. The variables of Employee PsyCap and L-OC had a weak positive correlation (R=0.27), which indicated that employees with higher PsyCap levels perceive their leaders to indeed be more open to change. The variables of Perceived Leader PsyCap and L-OC were close to none (R=0.02), which suggests little to no relationship between the two. However, the correlation between Actual Leader PsyCap and E-OC was a weak negative (R=-0.29), meaning higher actual leader PsyCap is associated with lower employee openness to change, which again seems counter-intuitive and would require further investigation. The weak negative correlation (R=-0.23) between Actual Leader PsyCap and L-OC would indicate that despite the leaders rating themselves with a higher PsyCap, they do not necessarily see themselves as open to change. The correlation between E-OC and L-OC was also a moderate negative correlation (R=-0.33) which implies that employees who are more open to change could perceive their leaders as less open to change, at least compared to themselves. The variables E-OC and Employee Twin Transition practices (E-TT) had a strong positive correlation (R=0.56), which indicates that employees who are more open to change are significantly more engaged with twin transition practices i.e. the changes that they bring in an organization. However, the weak negative correlation between E-OC and L-TT (R=-0.21) could suggest that employee openness to change is inversely related to the leaders engagement with twin transition practices and would require further research.

5.2.3 Twin Transition

Through the survey, participants were asked about their understanding of the twin transition process within their organization. The L-TT mean (3.50) shows that they have a moderate perception of twin transition practices in their company and see much more room for improvement, perhaps considering that they are still in the beginning stages of the development. The variables of L-OC and E-TT also had a near zero correlation (R=0.03) which would mean minimal or no relationship between the two. However, L-OC and L-TT had a strong positive correlation (R=-0.54) which indicates that leaders who are more open to change are significantly more engaged with the twin transition practices. E-TT and L-TT had a weak positive correlation (R=0.18) which suggests a slight relationship between the two, and could be an indicator that both parties have similar understandings of the twin transition practices. Interestingly, the variables of Employee PsyCap and E-TT have a moderate positive correlation (R=0.44) which suggests that employees with higher PsyCap have a better understanding of the twin transition practices in their respective organization. However, the correlation between employee PsyCap and L-TT was a moderately negative one (-0.28) which could indicate that higher employee PsyCap is associated with lower engagement with twin transition practices by leaders. Perceived Leader PsyCap and E-TT had a moderate positive correlation (R=0.51) which suggests that employee perceptions of leader PsyCap is associated with better understanding of twin transition practices. Similarly, the weak positive correlation between Perceived Leader PsyCap and L-TT (R=0.38) suggests that there is an association between perception of leader PsyCap and their engagement. The variable of Actual Leader PsyCap had near zero correlations with E-TT (R=-0.08) and L-TT (R=-0.04).

Overall, it seems that leaders rate their twin transition practices lower than the employees. These discrepancies could be coming from the differing levels of organizational understanding, role responsibility, or criteria that they use to make these judgements on the twin transition practices in the organizations. This data provides us with insights to how employees and leaders perceive the organization's movement to becoming more digital and sustainable. The misalignments here between employees and leaders could indicate that the organization can better address change management strategies.

6. DISCUSSION, LIMITATIONS, AND FUTURE RESEARCH

6.1 Discussion

The results from this research emphasize the role of PsyCap and a positive outlook towards cultivating change in the context of an organization that is on the path towards a twin transition. Leaders with higher PsyCap levels are more likely to embrace and advocate for change, perceiving it as a necessity rather than a "good to have," push for a company culture shift that inspires their employees, and try to implement effective change management practices towards integrating sustainability and digitally oriented strategies catered to long-term organizational success. The findings align with prior literature that suggests that PsyCap can be a significant driver of positive organizational results (Luthans et al., 2007). The correlation between Perceived Leader PsyCap and E-TT (R=0.51) suggests that leaders with higher perceived PsyCap leaders can indirectly foster a more adaptive environment for the organization. Leaders who are more open to change also show more engagement with twin transition practices (R=0.54). The first subquestion of the study about what role an individual's PsyCap

play in the twin transition, can be addressed by the data that suggests high PsyCap leaders are more proactive and supportive in initiating change measures, as well as more persistent towards the implementation of them, that can facilitate a smoother transition. The second sub question of how a leader's PsyCap drives willingness to change towards the twin transition, can be answered by the observation in the relationship between Perceived Leader PsyCap and E-TT (R=0.51). It implies that when employees perceive their leaders to have high PsyCap, they are more willing to engage in the practices. Leaders with a more positive outlook towards the change processes were more likely to have proactive plans and supportive measures in place, which highlights the importance of leadership in change management (Cameron & Green, 2012), which in this context considers practices towards the twin transition. Since the L-OC is strongly correlated with L-TT (R=0.54), it reinforces the idea that openness to change plays a significant role in the successful implementation of twin transition practices.

Through the interviews and analysis, the importance of initiatives involving sustainable and digital transformations in surviving the market (Bharti et al., 2022) was made clear, as there are different drivers towards the changes (e.g. individuals willingness, legal requirements, client demand, etc.), which would also help explain the weak relationships between actual leader PsyCap and L-OC. The interviews supported the research by Grabl et al. (2022), which indicates that the synergy between digital and sustainable transformations comes from digital solutions that enable sustainable measures such as automation, data optimization, monitoring systems, etc. While the leaders seemed to agree that the two topics of sustainable and digital transformation go hand-in-hand, there may be some aspects where it is difficult to apply both at the same time, since sustainability and digitalization can appear different depending on the organizational level being considered (Diodato et al., 2023; Stoughton & Ludema, 2012). Regardless, it was evident that the transition process would bring about some sort of competitive advantage, whether it be becoming more efficient, improving working conditions, or being more appealing to customers that place importance on sustainability. With an intrinsic motivation to change, along with the extrinsic motivation of standing out in the market, leaders were not only more open to change themselves, but also wanted to promote it further and encourage their employees to be receptive towards the change by creating the environment for it.

6.1.1 Theoretical and Practical Implications

The findings of this study provide insights for organizations that are undergoing change processes such as the twin transition by utilizing psychological capital as a resource. The Job Demands-Resources (JD-R) model suggested that resources i.e. PsyCap as a personal resource, can help in the mitigation of job demands, which could be stressors or reluctance from the changes that the twin transition brings (Bakker & Demerouti, 2007). The findings of this research support this model, which suggest that there is a positive relationship between high PsyCap leaders who are better prepared and more confident towards handling the demands that the transition process brings. The strong positive correlation between employee PsyCap and E-OC (R=0.58) supports H1: PsyCap has a positive correlation to openness to change, especially for employees. This aligns with the JD-R model where PsyCap acts as a valuable resource when dealing with stressors like change.

The strong positive correlation with E-OC and E-TT (R=0.56) suggests that they are more receptive to the implementation of practice, and hence supports H2: Openness to change is

positively correlated to the adoption of twin transition practices. A leader's PsyCap plays a significant role in shaping their willingness to change, and also shapes their employee's willingness to adopt the change practices of the twin transition. With higher PsyCap levels, the company culture is more likely to be open, and encourage employee engagement. The resilience and optimistic factors in their PsyCap act as psychological resources that could mitigate the stress and uncertainties that are associated with the organizational changes, which can lead to a smoother adoption of the change practices. The correlation of Employee PsyCap, E-TT and E-OC shows that higher capital helps them adapt to the new practices. This can also help suggest that job resources can cultivate a motivational company culture, improving well-being and performance. The positive mindset of the leaders has a high chance of being reflected down to their teams or employees, which in the end creates a more supportive work-environment that is more conducive towards changes.

The findings of this research can offer various implications for leaders and organizations, especially considering the importance of personal resources in the JD-R model. Since there is a positive relationship between PsyCap and the adoption of twin transition practices, organizations can further invest in training and development programs (e.g. techniques on how to remain hopeful) that are specially designed to enhance leader PsyCap levels. Additionally, by understanding the importance that a leader can have on their team or on their employees, leaders should try to focus on creating a supportive culture that encourages clear communication, accessible resources, and open environment so that the employees can better ease into the change processes. Organizations and leaders can also use these findings to further invest into their leadership skills or styles, or find ways to increase how employees perceive their leader's PsyCap to be. Since the twin transition of organizations moving to be more sustainable and digital acts as a change, the findings of this study can be applicable to other kinds of changes or organizational shifts that they may be going through.

6.2 Limitations and Future Research

Despite the insights and data collected, this study has several limitations. First and foremost, the research was limited by the researchers' lack of experience in conductive qualitative and quantitative research, along with the scope and timeframe of the thesis. One significant limitation for both the qualitative and quantitative results would be the potential for the social desirability bias (Grimm, 2010; Fisher, 1993). As the topics of sustainability and digital transition are positive emerging trends, the leaders may have provided biased responses that may have highlighted them and their respective organization in a more positive light than true in reality. They could have responded in a way that they believed was expected of them and the organization they are a part of, for instance, desiring to be seen as someone with a high PsyCap, or claiming that the organization is further advanced in terms of the twin transition practices than it really is. Similarly, employees who answered the survey, may have answered in a way they wanted to be seen (i.e. someone with a high PsyCap). Since the survey was distributed to the employees by their managers, they may have rated their managers PsyCap, understanding of organizational change and twin transition practices, higher than actuality possibly due to feeling pressured to respond in a more positive manner and represent the company well (Grimm, 2010). Although it was clearly stated in the surveys and interviews that the data collected would be kept confidential, perhaps even further emphasizing this would be beneficial. By reiterating that

there will be no repercussions for their honest feedback, and the importance of answering truthfully, perhaps the extent of the social desirability bias can be mitigated in future research.

While the data collected was specific and detailed, another limitation would be the scope of it. The sample size of seven leaders for qualitative data, and a total of 27 quantitative data makes it difficult to generalize findings to a broader context. While the leaders interviewed were all part of diverse industries, it is challenging to know whether they represent the industry well. Additionally, the variance between the results was limited, with a relatively low range and small sample, the reliability of the data could be challenged. With a larger sample size, especially in quantitative data, further statistical analysis such as regression can be conducted to test the relationships between the variables. Future research should aim to get a larger sample size, and even more diversity in industries in order to enhance the generalizability of the results.

This study utilized a mixed-methods approach that was abductive in nature, where it began with existing observations and tried to come up with ways to explain those. The questions in the semi-structured interview could have been better targeted in getting explicit responses for the PsyCap component. Future research can try to utilize this study and further test it with a more confirmatory approach, using which the findings can be further validated and built onto the theoretical framework. This research mainly focused on the impact PsyCap has on the twin transition, with the mediating role of openness to change. However, other variables such as KPIs, employee engagement, leadership styles, etc. and their relationship with the twin transition can be further explored for future research. Furthermore, longitudinal studies can be conducted to understand the long-term impact of PsyCap levels in the journey of adopting twin transition practices even more in depth. Despite the limitations of this study, it brings its own contributions to the gaps in literature on the role of positive psychology in the context of change management, especially in the context of organizations undergoing the twin transition. The similarities observed across the interviews with diverse industry representatives suggests that the principle findings of the research can have a broader applicability, which can serve as a basis for future research in organizational change. This research attempts to emphasize the importance and the relationships of investing in people, their mindset, in creating a supportive organizational culture, that is able to face challenges associated with change in order to achieve long-term success.

7. CONCLUSION

This research has aimed to explore how positive psychology resources contribute to a leader's ability to promote organizational change in the context of the twin transition. openness to change was a mediating variableThe JD-R model provided a framework to help understand the dynamics at play between psychological resources such as PsyCap and change demands that the twin transition could bring. Even though the analysis included some counterintuitive findings, the overall findings support the role of PsyCap in facilitating the twin transition. Further research is required to better understand these relationships and discrepancies. The implications of this research may extend beyond the context of the twin transition and to other types of organizational change. By enhancing PsyCap and better understanding these relationships, organizations can better face changes and any resistances the transitions or change process may bring. Integrating and investing in PsyCap into leadership development programs can be of value to organizations aiming to increase their adaptability in terms of change practices.

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Appendix A: Interview Questions Guide

Section 1: General overview
  1. Name and introduction
  2. What organization are you a part of?
  3. What is your position in the organization?
  4. What is your relationship to digital transformation within the organization?
      a. How does this impact your daily work?
  5. What is your relationship to sustainability
      a. How does this impact your daily work?

Section 2: Twin transition and further insights

According to the Joint Research Centre (2022), the twin transition is the process by which sustainable and digital transformation support each other and take place in parallel.

  6. Do you believe that twin transition is a more effective way of tackling sustainable and digital transition than approaching these issues separately? If yes/no, then please elaborate.
  7. In what ways can digital and sustainable transformation support each other and be approached together, and in what areas should they be treated differently?
  8. Could you please explain and elaborate with some examples, on how far along your company is in implementing digital tools and processes?
  9. Could you please explain and elaborate with some examples on how implementing sustainability practices looks like in your company?
  10. Could you please further explain with some examples on how your company's path towards the twin transition looks like?
  11. Could you expand more on how willing your organization is to the adoption of the change that the transition brings?
      a. What are some practices / initiatives that you have taken to ease into the change process? and / or how do you plan to further develop it?
      b. How have your employees previously received change (if) it has occurred?
      c. How, or in what ways do you perceive your employees easing into the change process in the future?

Are there any additional questions, comments or remarks that you would like to add?

Leader survey link
https://qualtricsxmtrrrs2582.qualtrics.com/jfe/form/
SV_9ovlvCMpgAIR3Ku

Employees survey link:
https://qualtricsxmtrrrs2582.qualtrics.com/jfe/form/
SV_24U53jR9rt7XNuC

Appendix B: PCQ

Psychological Capital Questionnaire (PCQ)

Self Efficacy (1-6)
1. I can usually handle whatever comes my way.
2. I am confident that I can deal efficiently with unexpected events.
3. When I am confronted with a problem, I can find several solutions.
4. I can remain calm when facing difficulties because I can rely on my coping abilities.
5. Thanks to my resourcefulness, I can handle unexpected situations.
6. If I am in trouble, I can usually think of a solution.

Hope (7-12)
7. I can think of many ways to get out of a jam.
8. I energetically pursue my goals.
9. There are lots of ways around any problem.
10. I've been pretty successful in life.
11. I can think of many ways to get the things in life that are most important to me.
12. I meet the goals I set for myself.

Resilience (13-18)
13. I usually manage one way or another.
14. I can be on my own if I have to.
15. I usually take things in stride.
16. I feel that I can handle many things at a time.
17. I can get through difficult times because I've experienced difficulty before.
18. When I'm in a difficult situation, I can usually find my way out of it.

Optimism (19-24) (20 & 23 reverse coded)
19. In uncertain times, I usually expect the best.
20. If something can go wrong for me, it will.*
21. I always look on the bright side of things.
22. I'm always optimistic about my future.
23. Things never work out the way I want them to.*
24. I'm a believer in the idea that "every cloud has a silver lining".

Appendix C: OCQ - C, P, R

Organizational Change Questionnaire - Climate of Change, Processes, and Readiness (OCQ-C,P,R)

Climate (18 items) (Reverse coded items: 1,9,10)

1. My manager does not seem very keen to help me find a solution if I have a problem.*
2. If I experience any problems, I can always turn on my manager for help.
3. My manager can place herself or himself in my position.
4. My manager encourages me to do things that I have never done before.
5. Corporate management team consistently implements its policy in all departments.
6. Corporate management team fulfills its promises.
7. Corporate management team keeps all departments informed about its decisions.
8. Two way communication between corporate management team and departments is very good.
9. There is strong rivalry between colleagues in my department.*
10. I doubt whether all of my colleagues are sufficiently competent.*
11. I have confidence in my colleagues.
12. My department is very open.
13. Changes are always discussed with all people concerned.
14. Decisions concerning work are taken in consultation with the staff who are affected.
15. Front line staff and office workers can raise topics for discussion.
16. Within our organization, power games between the departments play an important role.
17. Staff members are sometimes taken advantage of in our organization.
18. In our organization, favoritism is an important way to achieve something.

Change specific (15 items) (Reverse coded: 28,29)

19. I am regularly informed on how the change is going.
20. There is good communication between project leaders and staff members about the organization's policy toward changes.
21. Information provided on change is clear.
22. We are sufficiently informed of the progress of change.
23. Departments are consulted about the change sufficiently.
24. Staff members were consulted about the reasons for change.
25. Our department's senior managers pay sufficient attention to the personal consequences that the changes could have for their staff members.
26. Our department's executives speak up for us during the change process.
27. Our department's senior managers coach us very well about implementing change.
28. Our department's senior managers have trouble in adapting their leadership styles to the changes.*
29. Our department's executives focus too much on current problems and too little on their possible remedies.*
30. Our department's executives are perfectly capable of fulfilling their new function.
31. Corporate management team has a positive vision of the future.
32. Corporate management team are actively involved with the changes.
33. Corporate management team supports the change process unconditionally.

Readiness (9 items) (Reverse coded: 37, 38, 39)

34. I want to devote myself to the process of change.
35. I am willing to make a significant contribution to the change.
36. I am willing to put energy into the process of change.
37. I think that most changes will have a negative effect on the clients we serve. *
38. Plans for future improvement will not come to much. *
39. Most change projects that are supposed to solve problems around here will not do much good. *
40. I have a good feeling about the change project.
41. I experience the change as a positive process.
42. I find the change refreshing.

Appendix D: Type of Data Collected

Table 1: Data Collected

Who?	Data type?	What?
Leaders	Qualitative Semi-Structured Interviews	Insights on digital and green transformation, change implementation and future outlook of the organization
	Quantitative Survey	1. Individual PsyCap 2. OCQ-C,P,R, 3. Understanding of Twin Transition (TT)
Employees	Quantitative Survey	1. Individual PsyCap 2. Perceived manager PsyCap 3. OCQ-C,P,R, 4. Understanding of TT

Table 2: 'HERO' Components of PsyCap (Luthans & Youssef, 2007)

1. Hope	Motivational state of an individual with internalized determination (Tang, 2020) to be creating and able to redirect paths that lead to achieving organizational goals to the best of their abilities.
2. Efficacy	Drawing up on Albert Bandura's theory on self-efficacy (1997), self-efficacy is one's belief in how they can reach desired goals
3. Resilience	The ability of being able to bounce back better than before when faced with problems and resistance in order to reach success
4. Optimism	Style of thinking that includes having a positive outlook towards the future despite uncertainties

Appendix E: Structured Qualitative Results

First Order Concepts	Second Order Themes	Aggregate Dimensions

First Order Concepts:

- Hoping for the best
- Ambitious goals
- Strategic development plans

→ Hope

- Confidence to do something
- Performance by digitalization
- Enhanced collaboration
- Gradual growth and implementation

→ Efficacy

- Adapting to change
- Receiving positive response to change
- Long-term orientation
- Continuous efforts

→ Resilience

- Positive outlook
- Supportive environment
- Leading by example
- Enthusiam and personal commitment

→ Optimism

Hope, Efficacy, Resilience, Optimism → PsyCap

- Training and supporting employees
- Asking provoking questions
- Awareness and recognition of change
- Commitment to transform
- Improving working conditions
- Efforts towards sustainability

→ Want to change

- Sustainability as a selling-point
- Enhanced market position
- Increased efficiency and productivity

→ Competitive advantage

Want to change, Competitive advantage → Openness to change

- Monitoring systems to minimize waste
- Innovative systems implemented
- Sustainability certifications
- Educating employees

→ Sustainability

- Computer-driven systems
- AI for process optimization
- Secure operations
- Implementing new software

→ Digitalization

- Reluctance towards changes
- Finding the right workforce
- Employee unfamiliarity
- Difficulty in finding balance
- Lack of understanding of clients ability
- Investment and resource allocation
- Reliance on external factors

→ Challenges

- Training and development
- Using real examples to facilitate understanding
- Supportive environment
- Communication and meetings
- Employee involvement

→ Practices

Sustainability, Digitalization, Challenges, Practices → Twin Transition

Appendix F: Compiled Quantitative Survey Results

ExcelDataCor.xlsx