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BAYREUTH

**Balancing Stability and Fluidity in Post-Bureaucratic Organizations:
Insights from Coworking-Spaces**

Dissertation

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*„There are in fact two things, science and opinion;
the former begets knowledge, the latter ignorance“*

Hippocratic Writings (1978, p. 69).

Hippocrates (~460 B.C. - ~370 B.C.)

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The research on *Balancing Stability and Fluidity in Post-Bureaucratic Organizations: Insights from Coworking-Spaces* in the context of fluid organizational forms, such as coworking-spaces or makerspaces, not only offer the necessary infrastructure and a collaborative and professional working environment. Coworking and the associated open working environments also emphasise the strength of the diversity of communities, the self-determination of work, the shared exchange of knowledge and the innovative working conditions that arise from this. Together, these are the drivers of productivity, efficiency, and the success of a modern working society in the digital era.

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ABSTRACT

In a world where change is constant, the fluidity of organizations becomes imperative. This dissertation delves into the intricate dynamics of fluid organizations and their strategies, particularly in the face of profound shifts induced by mobile work and digitalization in a post-bureaucratic era. This research underscores the pressing challenges encountered by contemporary organizations amidst globalization, technologization, and digitalization. Organizations must cultivate adaptability and provide conducive conditions for change to thrive in this dynamic landscape. Consequently, structures and processes characterized by low formality, de-hierarchization, and heightened flexibility are being embraced to navigate organizations through the uncertainties of the modern world. This topic gains significance in the realms of strategy and organizational development as researchers strive to comprehend the complexities of modern post-bureaucratic organizations and their work environments.

A key focal point of this dissertation is the exploration of coworking-spaces, which epitomize the fluidity and adaptability sought by contemporary organizations. Coworking-spaces, rooted in the ethos of New Work, foster creativity, innovation, and collaboration in a decentralized environment characterized by autonomy and flexibility. Through an extensive examination of various facets of coworking-spaces, ranging from structural design to community dynamics, this research aims to unveil the mechanisms underlying their fluid organizational nature and stability-enhancing structures and processes. The primary research question is which structural and procedural factors contribute to the balance between stability and fluidity in fluid post-bureaucratic organizations. By conceptualizing coworking within the framework of fluid organizations and New Work principles, this dissertation offers valuable insights into how organizations can leverage these spaces to achieve desired outcomes in an ever-evolving environment.

Through a comprehensive review of existing literature and a series of empirical studies, this dissertation sheds light on the nuanced interplay between fluidity and stability in coworking-spaces. Bridging the gap between theory and practice provides actionable recommendations for organizations seeking to harness coworking-spaces' potential in fostering innovation, sustainability, and knowledge exchange. Ultimately, this research contributes to a deeper understanding of fluid organizations in the context of New Work and lays the groundwork for future research endeavours in the realms of organizational development, strategy, entrepreneurship, and innovation.

ZUSAMMENFASSUNG

In einer Welt, in der ständiger Wandel herrscht, ist die Fluidität von Organisationen unabdingbar. Diese Dissertation befasst sich mit der komplexen Dynamik von fluiden Organisationen und ihren Strategien, insbesondere angesichts der tiefgreifenden Veränderungen, die durch mobile Arbeit und Digitalisierung in einer post-bürokratischen Ära ausgelöst werden. Diese Forschung unterstreicht die dringenden Herausforderungen, denen sich moderne Organisationen inmitten von Globalisierung, Technologisierung und Digitalisierung gegenübersehen. Organisationen müssen Anpassungsfähigkeit kultivieren und förderliche Bedingungen für Veränderungen schaffen, um in dieser dynamischen Landschaft erfolgreich zu sein. Folglich werden Strukturen und Prozesse, die sich durch geringe Formalität, Enthierarchisierung und erhöhte Flexibilität auszeichnen, eingesetzt, um Organisationen durch die Ungewissheiten der modernen Welt zu navigieren. Dieses Thema gewinnt in den Bereichen Strategie- und Organisationsentwicklung an Bedeutung, da sich die Forscher bemühen, die Komplexität moderner postbürokratischer Organisationen und ihrer Arbeitsumgebungen zu verstehen.

Ein wichtiger Schwerpunkt dieser Dissertation ist die Erforschung von Coworking-Spaces, die die von modernen Organisationen angestrebte Fluidität und Anpassungsfähigkeit verkörpern. Coworking-Spaces, die im Ethos der New Work verwurzelt sind, fördern Kreativität, Innovation und Zusammenarbeit in einem dezentralen Umfeld, das sich durch Autonomie und Flexibilität auszeichnet. Durch eine umfassende Untersuchung verschiedener Facetten von Coworking-Spaces, die von der strukturellen Gestaltung bis hin zur Gemeinschaftsdynamik reichen, zielt diese Untersuchung darauf ab, die Mechanismen aufzudecken, die ihrer fluiden organisatorischen Natur und ihren stabilitätsfördernden Strukturen und Prozessen zugrunde liegen. Vorrangig wird der Forschungsfrage nachgegangen, welche strukturellen und prozessualen Faktoren in fluiden post-bürokratischen Organisationen das Gleichgewicht zwischen Stabilität und Fluidität fördern. Durch die Konzeptualisierung von Coworking im Rahmen von fluiden Organisationen und New-Work-Prinzipien bietet diese Dissertation wertvolle Einblicke in die Art und Weise, wie Organisationen dieses Konzept nutzen können, um in einer sich ständig weiterentwickelnden Umwelt die gewünschten Ergebnisse zu erzielen.

Durch eine umfassende Sichtung der vorhandenen Literatur und eine Reihe empirischer Studien beleuchtet diese Dissertation das nuancierte Wechselspiel zwischen Fluidität und

Stabilität in Coworking-Spaces. Indem sie die Kluft zwischen Theorie und Praxis überbrückt, liefert sie umsetzbare Empfehlungen für Organisationen, die das Potenzial von Coworking-Spaces für die Förderung von Innovation, Nachhaltigkeit und Wissensaustausch nutzen wollen. Letztlich trägt diese Forschung zu einem tieferen Verständnis von fluiden Organisationen im Kontext von New Work bei und legt den Grundstein für zukünftige Forschungsbemühungen in den Bereichen Organisationsentwicklung, Strategie, Entrepreneurship und Innovation.

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1 INTRODUCTION

1.1 MOTIVATION AND RESEARCH CONTEXT

Nothing endures but change. The philosopher Heraclitus (fl. c. 500 BC) already named this with the saying *panta rhei* (Plato, 1921).

Particularly in light of an increasingly dynamic world characterised by uncertainty, rapid change, and speed (Schreyögg & Sydow, 2010), contemporary organizations and their employees are facing significant challenges due to increasing globalisation (Autio et al., 2021; Barkema et al., 2002), technologization (Kellogg et al., 2006), and digitalisation (Hanelt et al., 2021). In order to overcome these challenges, constant adaptability and openness to change is essential, but also that the conditions for change are provided (e.g., Kellogg et al., 2006). Accordingly, organizations are developing structures, processes, and competencies that are characterised by low formality, low authority, de-hierarchisation, a greater focus on sense-making and social identification, as well as a greater flow within and between processes in order to be able to flexibly adapt to prevailing circumstances (Schreyögg & Sydow, 2010; Morand, 1995). Consequently, this topic is becoming increasingly relevant, especially in research on strategy and organizational development (e.g., Choudhury, 2022; Choudhury et al., 2021; Dobusch & Schoeneborn, 2015; Schreyögg & Sydow, 2010).

Although the findings of previous research contribute fragmentally to the understanding of modern post-bureaucratic organizations and their work environments, researchers have identified and characterized various organizational forms that deviate from classical formal organizations by resembling looser social collectives. These forms of organization exhibit greater liquidity or fluidity, especially by enabling virtual and loose collaboration through new digital technologies (Kociatkiewicz & Kostera, 2014; Puranam et al., 2014; Schreyögg & Sydow, 2010). Schreyögg and Sydow (2010) define a fluid organization as an organizational form that can ad hoc react and adapt to changing circumstances. Fluid organizations achieve this flexibility and rapid adaptability to deal with uncertainties and dynamics by decentralizing their decision-making processes paired with limited hierarchy and self-organizing systems (Pesch et al., 2021; Bourgoin et al., 2020) as well as by avoiding strict organizational boundaries, processes, and structures (Pesch et al., 2021; Schreyögg & Sydow, 2010; Kellogg et al., 2006). In this vein, fluid organizations' lower formalization and reduced bureaucracy (Weber, 1947) allow them to rely on horizontal, participative, and

improvised work processes (Pesch et al., 2021; Kellogg et al., 2006). The bureaucratic organization once described by Weber (1978) as an Iron Cage is metaphorically changing towards a Glass Cage with increasing inclusion of fluidity and liquidity (Clegg & Baumeler, 2010). Nevertheless, a certain level of formalization prevails, reducing uncertainties and ambiguities (Weber, 1947) and thereby guaranteeing a certain level of structure and stability. However, it still provides a structural framework that can adapt flexibly to dynamic circumstances.

Fluid organizational forms differ from conventional ones that develop path dependencies, recursive practices, rigid identities, or economies of specialization (Schreyögg & Sydow, 2010). Usually, fluid organizations share the characteristic that their members' membership is unclear, and their boundaries are permeable (Schreyögg & Sydow, 2010). Nevertheless, followed by Dobusch and Schoeneborn (2015), social collectives might also be regarded as organizations based on three noteworthy criteria – whether there are interconnected decision-making instances (Ahrne & Brunsson, 2010), whether there is a common actorhood (King et al., 2010), and whether they achieve a collective identity through identity claims (Schreyögg & Sydow, 2010; King et al., 2010; Bartel, 2001). For example, in the context of open-source software development, O'Mahony and Ferraro (2007) and Puranam et al. (2014) identified loose social collectives of people working together to improve software products as an organizational form. Furthermore, Dobusch and Schoeneborn (2015) stated that hacker collectives such as Anonymous also constitute an organization. Similarly, social collectives, such as terrorist groups, are also considered a form of loose organization (Comas et al., 2015; Schoeneborn & Scherer, 2012) with interconnected decision-making instances, a common actorhood, and a collective identity.

Fluid and decentralised organizations increasingly focus on promoting creativity and innovation among their members, often also supported by the application of digital technologies such as artificial intelligence (Yacoub & Haefliger, 2024; Berbegal-Mirabent, 2021; Rese et al., 2021). In fluid organizations, their members can flexibly choose space and time for their working tasks to optimise their performance and still guarantee a fulfilled private life. These changes align with the social trends towards more autonomy, self-determination, flat hierarchies, and more social responsibility sparked by globalisation and digitalisation (Antoine, 2021; Helmold, 2021; Bergmann, 2019). These aspects can be summarised in the term New Work (Bergmann, 2019). Working in modern post-bureaucratic

work environments, which challenges the formal bureaucratic logic of organising, is particularly prevalent in so-called coworking-spaces (Bouncken & Reuschl, 2018; Gandini, 2015; Spinuzzi, 2012). Coworking not only integrates the various elements of New Work but also offers work communities more autonomy, flexibility, and opportunities for social interaction in view of the fluidity of centralised organizations (Bouncken & Tiberius, 2023; Fecher et al., 2020; Bouncken & Reuschl, 2018). Coworking-spaces thus serve as a valuable field for a more in-depth investigation of fluid forms of organization.

Research on the coworking phenomenon began in rudimentary form in the early 2000s (e.g., Sweet & Moen, 2004), although the articles by Spinuzzi (2012), Garrett et al. (2017), and Bouncken and Reuschl (2018) laid the foundation for our current understanding of coworking-spaces (Kraus et al., 2022). According to Kraus et al. (2022, pp. 6–10), coworking research can be categorised into four streams:

1. *Definition, typologies, and understanding of coworking community building* (e.g., Spinuzzi et al., 2019; Garrett et al., 2017; Richardson, 2017; Capdevila, 2015; Spinuzzi, 2012).
2. *Benefits, prototypes, and sustainability of coworking-spaces* (e.g., Bouncken & Aslam, 2019; Bouncken & Reuschl, 2018; Bueno et al., 2018; Waters-Lynch & Potts, 2017; Bouncken et al., 2018).
3. *Understanding coworking-spaces' factors and their influence on the organization* (e.g., Bouncken et al., 2021; Vidaillet & Bousalham, 2020; Blagoev et al., 2019).
4. *Makerspaces to promote consumer innovation and economic development* (e.g., Halbinger, 2018; Svensson & Hartmann, 2018; van Holm, 2017).

For the course of this thesis, Further research sub-classifications are relevant, for example, the influence of spatial design and architecture on emotionality and social values in coworking-spaces (e.g., Bouncken & Aslam, 2023; Bouncken et al., 2021) and the influence of various coworking-space specifics on the innovative ability of users in the space (e.g., Bouncken et al., 2021; Bouncken et al., 2020a; Bouncken et al., 2020b).

Generally, coworking-spaces offer modern work and social areas where, for example, freelancers, independent professionals, entrepreneurs, startup-founders, or employees of firms can work alone and together (Bouncken & Reuschl, 2018; Spreitzer et al., 2015a). They can collaborate for work, knowledge exchange, and social activities (Yacoub &

Haefliger, 2022; Spinuzzi et al., 2019). Thus, coworking-spaces follow the basic features of the sharing economy (Bouncken & Reuschl, 2018), like Airbnb and Uber (Plewnia & Guenther, 2018), and integrate a variety of modern work characteristics (Leclercq-Vandelannoitte & Isaac, 2016). Especially in post-COVID-19 times, coworking-spaces gained importance as a hybrid solution that creates a balance between home and corporate office (Cabral & van Winden, 2022; Howell, 2022). The concept's success is evident because there were more than 34,000 coworking-spaces worldwide in 2023 (Statista, 2023).

In line with the increasing abundance of coworking-spaces, numerous different coworking-space formats have emerged over time that differ in their ownership, design (e.g. architecture, interior, design), community criteria, value propositions, and revenue models (Bouncken & Aslam, 2019; Blagoev et al., 2019). Previous research has identified four different types of coworking-spaces: Independent coworking-spaces, corporate coworking-spaces, open corporate coworking-spaces, and consultancy coworking-spaces (Bouncken et al., 2018). The owner of independent coworking-spaces can be an independent coworking company (e.g., WeWork) or a person who provides office space to the public and offers membership in the course of utilisation. Corporate coworking-spaces are spaces designed on company-owned premises that are only accessible to the employees of a company. On the other hand, open corporate coworking-spaces are also company-internal coworking-spaces. However, these are also accessible to people external to the company up to a certain level in order to make third-party expertise and knowledge available to the company. The consultancy coworking-spaces are spaces operated by consulting companies that are intended to provide both their employees and clients with space to work and meet (Bouncken et al., 2021; Bouncken et al., 2018; Spreitzer et al., 2015b).

In recent years, the design concept of coworking-spaces has evolved from simple shared office spaces to highly themed communal and individual spaces, which vary depending on the focus of the coworking-space. Collaboration, sustainability, permeability/openness, and community, in varying degrees, are generally regarded as central elements (Merkel, 2015; Schürmann, 2013). Furthermore, they can promote their spaces' various aspects through design principles, such as community and creativity (Waters-Lynch & Duff, 2021; Capdevila, 2015). By extending the context of office work, coworking-spaces can offer functional equipment such as 3D printers, cutting equipment, and other makerspace elements. The spatial openness and diversity of users accordingly promote access to a broad

spectrum of knowledge and can stimulate creativity and innovation (Kopplin, 2021; Rese et al., 2020; Bouncken & Reuschl, 2018). Although coworking-spaces differ from one another, they also share same characteristics, like the provision of space for meeting and exchange in order to develop a sense of community, share knowledge and work together on challenges by allowing different users to group up. As a particularly relevant factor, previous research has identified that a sense of community is distinctive to coworking-spaces (Al-Omouh et al., 2021; Spreitzer et al., 2020; Vidaillet & Bousalham, 2020; Garrett et al., 2017). A sense of community defines a collective identity that evolves beyond a formal organization among different actors or groups of actors (Vidaillet & Bousalham, 2020). This relative absence of hierarchy and few formal rules, combined with the ability to socialise or collaborate autonomously, requires users to follow institutionalised norms and principles about how they do things (Lawrence & Dover, 2015; Jones & Massa, 2013). In this vein, shared resources in coworking-spaces enhance community cohesion, enable efficient utilization of idle or underutilized capacity, and generate new economic opportunities (Aslam et al., 2021). Thus, considering the post-bureaucratic view on coworking-spaces, this emphasizes the benefits of fluid and emergent ad-hoc coordination (Bourgoin et al., 2020; Kellogg et al., 2006).

Alongside the sense of community, there is also sociomateriality that can provide coordination in coworking-spaces (Bouncken et al., 2021; Katila et al., 2019). The term sociomateriality combines the materiality of a space with the sociality that can arise in a shared space. Accordingly, materiality and sociality are mutually enabling and are inherently inseparable (Leonardi, 2012; Orlikowski & Scott, 2008; Orlikowski, 2007). Materiality in coworking-spaces encompasses all spatial aspects (e.g., the interior design or colour schemes) and the artifacts contained therein (e.g., shared infrastructure like office desks and chairs, but also information systems or digital technologies like booking tools or matchmaking tools) (Bouncken & Aslam, 2023; Aslam et al., 2021; Bouncken et al., 2021; Kopplin, 2021). Consequently, changes in the materiality of coworking-spaces may lead to changes in the social practices of their users, promoting or restricting the sense of community, the exchange of knowledge or creativity. Accordingly, humans and space are entities that acquire capabilities, attributes, and form through their interpenetration (Bouncken & Aslam, 2023; Bouncken et al., 2021; Orlikowski, 2007). Sense of community and sociomateriality, thus, are coordination tools to develop behavior and practices in post-bureaucratic organizations and to provide stability.

Furthermore, the concept of coworking has also become relevant for an increasing number of companies that are reorganising their own structures and office spaces according to coworking-space principles (Bouncken et al., 2020b). Companies adopt these collaborative and open work environments to foster innovation and enhance employee satisfaction, creativity, and productivity (Bouncken et al., 2021). As a result, more conventional formal organizations today, which are also characterised by strong bureaucracy, are increasingly underdoing an organizational transformation (Romanelli & Tushman, 1994; Gersick, 1991) and showing an increasing degree of fluidity (Gümüşay et al., 2020) and flexibility (Englehardt & Simmons, 2002) in order to cope with the prevailing challenges and required changes of their organizational structure (Dobusch & Schoeneborn, 2015; Englehardt & Simmons, 2002). This shift towards more adaptable and less rigid structures allows these firms to better respond to market dynamics and technological advancements. Moreover, the integration of coworking principles helps break down hierarchical barriers, encouraging a more democratic and inclusive culture that can lead to higher levels of employee creativity and engagement.

Conclusively, based on what we know, coworking-spaces are organizations that are perceived as independent actors, develop identity claims, and have interconnected decision-making instances (Bouncken et al., 2022; Bouncken & Reuschl, 2018; Dobusch & Schoeneborn, 2015). Based on their characteristics, coworking-spaces represent a form of fluid organization in the context of the New Work movement (see chapter 2). Research on the fluidity of organizations invariably comes with its counterpart, stability. Whereas fluidity is associated with attributes such as lack of hierarchy, freedom from formality, or flexibility, stability represents formality, hierarchy, authority, or structure (Schreyögg & Sydow, 2010). Although there are fewer rules, less fixed structures, or less hierarchy in coworking-spaces, previous research on fluid organizations indicates that structures and processes are implemented to create a necessary level of stability (Dobusch & Schoeneborn, 2015; Schreyögg & Sydow, 2010). While fluidity and stability are often seen as contradictory, they are also mutually enabling and thus form a duality (Pesch et al., 2021; Aroles & McLean, 2016; Farjoun, 2010).

1.2 RESEARCH GAP AND THESIS STRUCTURE

Nevertheless, research on coworking-spaces has significant limitations. First, coworking-spaces were primarily viewed as a phenomenon of the sharing economy (Bouncken et al., 2020b; Bouncken & Reuschl, 2018). However, research on coworking-spaces is scarce in view of their fluid organizational nature (Bouncken & Aslam, 2019; Dobusch & Schoeneborn, 2015) and their structures and processes regarding the duality between stability and fluidity (Pesch et al., 2021; Aroles & McLean, 2016; Farjoun, 2010). Given the increasing fluidity and liquidity of post-bureaucratic organizations, the research question arises regarding which structures and processes can be used at which level to reconcile fluidity and stability.

Second, research on coworking concentrates on specific characteristics, such as the sense of community, the exchange of knowledge, or the spatial design, but can barely explore these hitherto separate characteristics in conjunction with each other. Furthermore, despite numerous articles, research is still considered a black box, as a large number of relevant variables are barely explored, for example, coworking-space member identities, provider narratives to specifically form and manage communities in the space, the sustainability aspect, or the acceptance and usage of digital technologies in coworking-spaces. In this vein, there is also a lack of quantitative empirical analyses in coworking-space research.

Therefore, the objective of this thesis is twofold. Firstly, coworking is to be considered from the perspective of a fluid form of organization embedded in the context of New Work, especially in order to explore the duality between fluidity and stability in post-bureaucratic organizations. Secondly, previous primarily inductive findings and still unexplored factors on structures and processes of coworking-spaces are examined and combined in deductive quantitative-empirical studies. Additionally, these factors are classified in the context of their stabilising effect on coworking-spaces' fluidity.

In summary, the findings of this thesis are intended to advance the understanding of coworking-spaces in regard to their adaptability to the New Work context and how they should be organizationally conceptualized to achieve desired outcomes, especially in stabilizing their fluidity. In this vein, the providers of coworking-spaces primarily provide structural stability by using structural levers, such as the design of the space (see Chapter 3), the use of narratives (see Chapters 4 and 5), or the use of guiding rules. Furthermore, stability can also be generated by processes in coworking-spaces, including, for example, the sense

of community (Blagoev et al., 2019; Garrett et al., 2017) or sociomateriality (Bouncken & Aslam, 2023; Bouncken et al., 2021; Orlikowski, 2007; also see Chapter 3). These insights are transferable to the broader research on fluid organizations. Thus, this thesis and its implications also contribute to the research streams of organizational development, strategy, entrepreneurship, and innovation. Additionally, the findings of this thesis offer valuable insights for contemporary companies that either have a fluid organization or are planning to evolve their organization in that direction.

This thesis comprises six previously published research articles based on the described objectives.

The first article (chapter 2) provides a conceptual model that embeds coworking in the New Work context and identifies coworking per se as a concept while addressing its strengths and challenges for implementation in organizations, thus enabling coworking-spaces to be viewed as a fluid form of organizations. The second article (chapter 3), an inductive qualitative paper, aims to conduct expert interviews to identify the structural as well as procedural aspects of coworking-spaces that contribute to a stabilizing effect of the otherwise fluid organizational structure. Based on these insights, articles three (Chapter 4) and four (Chapter 5), both deductive-quantitative in their methodology, contribute each with their findings to the stability through the structure aspect. In this vein, structural aspects are the use of spatial design, narratives, values, rules, and regulations by coworking-space providers. Finally, articles five (Chapter 6) and six (Chapter 7) refer to the stability through processes aspect, both also by deductive quantitative research designs. These articles discuss in more detail the use of digital technologies and their acceptance in coworking-spaces as well as the relational awareness and relational motivation between collaborators and how these factors contribute to the stability of fluid organizations. Figure 1 summarises the structure of the thesis.



Figure 1: Thesis structure.

The first research article, *Hybrid Multilocal Work: New Work Potentials in Remote, Coworking, and SME Offices*, was originally written in German and was published in *ZfKE – Zeitschrift für KMU und Entrepreneurship* in 2021. The article was translated into English for the thesis. As previously described, social collectives, such as coworking-spaces, form modern fluid forms of organization (Chapter 1.1). This conceptual article intends to get to grips with the various terms in the context of post-bureaucratic work and to prescribe coworking within it. Therefore, based on New Work, this study introduces *hybrid multilocal work* as a novel concept, which combines homeoffice, company office, and third place. Third places are predominantly represented by coworking-spaces. This concept encompasses the combination of office-based, mobile, and semi-mobile work, enabling flexibility to choose how, when, and from where employees want to work. Furthermore, in this context, the article explains significant challenges for small- and medium-sized enterprises and gives design recommendations on three different levels (functional level, cultural level, and design level).

Ricarda B. Bouncken and Till M. Gantert co-author this research article. The author of this thesis contributed particularly to the conceptualization and writing of the original draft as well as editing.

The second research article, *New Work Design for Knowledge Creation and Sustainability: An Empirical Study of Coworking-spaces*, was published in the *Journal of Business Research* in 2023. This qualitative-empirical article provides a deeper understanding of coworking-spaces that offer task autonomy alongside permeable spatial, task, team, and leadership boundaries compared to traditional work structures. In line with New Work, this article highlights several benefits of knowledge creation and sustainability in coworking-spaces, while they also face the risk of competition and knowledge leakage. Furthermore, the findings show that coworking-spaces can prepare their audiences by exposing sustainability in their communities, manifestos, and physical spaces. However, knowledge exchange occurs in different zones of the coworking-space. Overall, this article presents a conceptual model of knowledge creation processes in coworking-spaces, which depend on the exposure of sustainability targets. *Contribution to the dissertation's research question:* Through the chosen research design, the article provides first insights about structural and procedural factors that can ensure a certain degree of stability in fluid organizational forms such as coworking-spaces.

This research article is co-authored by Ricarda B. Bouncken, Mahmood M. Aslam, Till M. Gantert, and Andreas Kallmuenzer. The author of this thesis contributed particularly to the preparation, creation, and presentation of the finally published paper, specifically by critical review and revision as well as validation, investigation, and methodology.

The third research article, *Contextualizing Founder Identity in Coworking-spaces*, was published in the *Journal of Small Business Management* in 2024. This quantitative empirical article examines coworking-spaces in order to gain a richer insight into sociological and psychological theories of identity to elucidate how the reciprocal relationship between identity and context is critical to new venture performance. This study concludes that the innovation-based narratives generated by coworking-space providers significantly influence the performance of entrepreneurs within the space. The results also show that the alignment between the perceived social structure and the identity of a coworking-space positively influences its performance. *Contribution to the dissertation's research question:* Through their narratives and norms, coworking-space providers provide a structural framework that serves as a stabilizing factor to support collaboration and performance in the otherwise fluid environment of the space.

This research article is co-authored by Ricarda B. Bouncken, Katrina M. Brownell, Till M. Gantert, and Sascha Kraus. The author of this thesis contributed particularly to data curation, formal analysis, methodology, visualization, and writing by critical review, commentary, and revision.

The fourth research article, *The Moral Foundations of makerspaces as Unconventional Sources of Innovation: A Study of Narratives and Performance*, was published in the *Journal of Business Research* in 2022. This article focuses on a specific form of coworking-spaces, so-called makerspaces, where individuals and communities are given physical access to technologies and are empowered to craft in a physical space. Makerspaces offer the potential to improve autonomy, creativity, and motivation. As a result, makerspaces might help organizations maintain their employees' innovative capacity. This research aimed to shed light on the moral foundations of makerspaces from a design perspective, combining previously unconnected levels of makerspaces (technical level, social level, and cognitive level). The findings reveal that technical facilities can compensate for the lack of moral foundations in inexperienced and small teams. Drawing on qualitative comparative analysis (QCA), this article highlights the moral foundations of makerspaces as unconventional

sources of innovation. *Contribution to the research question of the dissertation:* These findings reveal that through structural specifications, such as narratives and norms, but also through limited access to technical equipment in the space, a certain level of formality is created, which in turn contributes to the stabilization of fluidity in the space.

This research article is co-authored by Till M. Gantert, Viktor Fredrich, Ricarda B. Bouncken, and Sascha Kraus. The author of this thesis contributed particularly to conceptualization, methodology, data curation, and writing of the original draft, as well as reviewing and editing.

The fifth research article, *Acceptance of Matchmaking Tools in Coworking-spaces: An Extended Perspective*, was published in *Review of Managerial Science* in 2022. This quantitative empirical article focuses on understanding the interwoven processes in coworking-spaces. The formation of community and shared instances in coworking-spaces may be simplified and optimised through so-called matchmaking tools. Further developing previous research, community-related and hedonic aspects are integrated into a framework based on the unified theory of acceptance and utilisation of technology. This article proves that personal innovativeness and hedonic motivation contribute to the intention to use matchmaking tools. A favourable social atmosphere is partly a substitute for using the tool. *Contribution to the dissertation's research question:* The use of hedonic and community-related aspects, as well as the use of digital technologies to further formalize these processes, also provide stability, which, to a certain level, is conducive to the innovativeness in coworking-spaces.

Christopher S. Kopplin, Till M. Gantert, and Julia V. Maier co-author this research article. The author of this thesis contributed particularly to validation, visualization, and writing by critical review, commentary, and revision.

Finally, the sixth research article, *Old Guards or New Friends? Relational Awareness and Motivation in Opportunities Seizing*, was published in the *European Management Journal* in 2022. This quantitative-empirical article ties in with the analysis of why members of organizations initiate collaborations, thereby enabling joint processes. To this end, this article draws on theories from cooperation research and examines company managers in its sample (thus avoiding an exclusive research context in coworking-spaces). This article provides insights into how relational awareness and relational motivation affect the durability and heterogeneity of inter-organizational relationships that managers build to

seize market opportunities. *Contribution to the dissertation's research question:* The findings can be transferred to the coworking-space context, albeit with limitations. Even though the members of coworking-spaces form communities and teams to support each other and share knowledge, they are also managers of their own companies, start-ups, or departments within companies to seize opportunities. Relational awareness and relational motivation can stabilize processes that lead to the durability and heterogeneity of relationships, contributing to the ability to survive in a dynamic competitive environment.

Agnieszka Zakrzewska-Bielawska, Wojciech Czakon, and Till M. Gantert co-author this research article. The author of this thesis contributed particularly to formal analysis, methodology, validation, and writing by critical review and commentary.

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2 HYBRID MULTILocal WORK: NEW WORK POTENTIALS IN REMOTE, COWORKING, SME OFFICES

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2.1 ABSTRACT

Hybrid multilocal work describes the combination of mobile, semi-mobile, and office-based work, enabling location and time-independent flexibility to choose how, when, and from where employees want to work. This study introduces the concept of hybrid multilocal work, which combines homeoffice, company office, and third place. We explain essential challenges for small- and medium-sized enterprises (SMEs) and give design recommendations on three different levels (functional, cultural, and design level).

Keywords: New Work; Hybrid multilocal work; coworking; remote work.

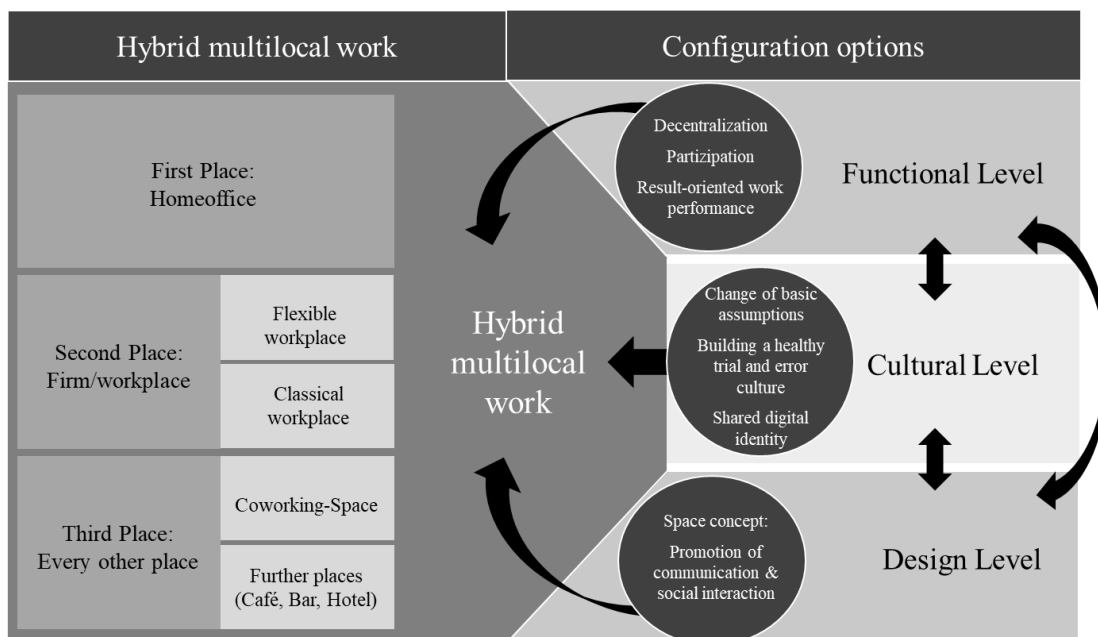


Figure 2: Graphical summary.

2.2 INTRODUCTION

The change in our work has been noticeable for several years and has been further driven by increasing digitalisation and, most recently, by the COVID-19 pandemic. Mobile work has come to the fore as an alternative or supplement to the traditional work structures of the past.

Mobile work describes work outside of offices with simultaneous flexibility and independence of time and place. This location-independence allows employees to use other work locations outside the company as an alternative to the homeoffice in the sense of a third place. According to Oldenburg's classification of place (1999), home is referred to as the first place, the workplace in the company as the second place, and any other place not at home or in the company as the third place. Third places, for example, coworking-spaces (CWS), have established themselves as workspaces and provide community, flexibility, and spontaneity through their creative and open space concepts (Bouncken & Reuschl, 2018). In the future, the office in the company will remain important as a workplace, but communication and interactive collaboration with others will take on central importance (in the second place). Accordingly, companies must allow more social meeting places in the future and promote communication and collaboration. This can be achieved through open and creative space concepts similar to those of CWS. In addition, work will be designed for more multilocality (first, second, third place), and the respective locations will be chosen according to function or temporary requirements (Petzold, 2017).

Advantages and disadvantages, as well as concepts for the choice and implementation of mobile, semi-mobile, and stationary work, are unavailable. The literature mainly focuses on the differentiation and characterisation of various forms of work locations (Bloom et al., 2015; Bouncken & Reuschl, 2018; Bouncken et al., 2021). What remains largely unconsidered is how links between different places of work and digitalisation can meaningfully lead to new work concepts or work environments, especially for SMEs. Therefore, this paper aims to provide a comprehensive understanding of so-called hybrid multi-local work and propose a first conceptual model. Further, we provide a definition and criteria for hybrid multilocal work and describe its different forms.

SMEs, in particular, which employ 71.3% of the workforce in Germany (KfW, 2019), are often more flexible than larger companies but also have more limited resources. In this respect, new hybrid multilocal work concepts for SMEs must be critically assessed for opportunities and risks and planned before facilitating a change. Accordingly, we address

the challenges for SMEs in the context of hybrid and multilocal forms of work and systematically derive configuration options intended to secure future flexibility and innovation potential for SMEs.

2.3 THEORETICAL FRAMEWORK

2.3.1 New Work and demands of modern work

New Work is a collective term for changes in the modern world of work. These changes are characterised by current requirements, such as work-life balance, flexibilization, value orientation, and sense-making (Hofmann et al., 2019). Digitalisation has made new flexible forms of work possible (Schwaber & Sutherland, 2017; Bouncken & Reuschl, 2018). The virtualisation of work equipment, digital networking, and the flexibilization of work locations, time, and content are the main features of New Work. Further, it is about participation, autonomy, and working atmosphere in order to enable the desired self-development and creation of meaning at work (Hackl et al., 2017). Four different trends are summarised in Table 1.

Trend	Description
Local and temporal flexibilization	<ul style="list-style-type: none"> - Various forms of flexible working hours (e.g. trust-based working) allow employees to organize their working day with a high degree of autonomy. - Focus on results-oriented working hours so that employees' performance is no longer assessed purely based on working hours but rather on the results of their work. - Technological developments and digital networking enable virtual collaboration and the associated remote working.
Agility and personal responsibility	<ul style="list-style-type: none"> - Firms must become more agile and self-organised to adapt flexibly and act quickly in an uncertain and dynamic environment. - In the context of the increasing mobility of work, it will become relevant in the future that agile organizational concepts are implemented by firms, accompanied by changing demands on managers and management systems away from hierarchy towards a coaching, lateral and supportive understanding of leadership (Lin et al., 2006).
Decentralization and de-hierarchization	<ul style="list-style-type: none"> - With the changing world of work, management structures and power distribution must be adapted through de-hierarchization, participative decision-making mechanisms and self-organization approaches (Lin et al., 2006).
Sense-making of work	<ul style="list-style-type: none"> - Keywords: independence, autonomy, and self-realization. - The meaningfulness of work is also made possible by digitalization, as repetitive tasks are increasingly being eliminated in today's working world and taken over by innovative programs or machines.

Table 1: Trends of New Work.

Source: Own illustration based on Hofmann et al., 2019.

2.3.2 Mobility and multilocality of today's work

Mobile work is considered a form of work that has been heavily discussed since the mid-1980s. Over time, terms such as telework, e-work, or remote work have been used. Despite the subtle differences, the terms refer to work outside the company's offices and that a specific place of work is becoming less important. In addition to local flexibility, mobile work is also characterised by flexible working hours.

The steadily increasing location- and time-independent flexibility of work and digitalisation allow for multilocality of work (Ovaska et al., 2020). Multilocality comprises various forms of mobility and generally refers to the lifestyle of a person whose everyday life is multilocal. The different localities often fulfil different functions (Petzold, 2017). The reasons for multilocality vary from weekend commuters to transnational workers (Danielzyk et al., 2020).

The term multilocality can be explained conclusively by describing the classification of a place according to Oldenburg (1999). The First Place specifies the homeoffice, which is complete or partial work from the private sphere. The Second Place is the company's traditional office, and the Third Place are other places where employees can do their work that are not at the First Place or Second Place. Thus, the Third Place offers employees an alternative place.

2.3.2.1 Homeoffice as First Place - Revival since the Beginning of the Pandemic

Local and temporal boundaries are becoming increasingly blurred in the context of the dissolution of boundaries between work and private life. It is possible to work from home and, due to the increasing flexibility of working hours, even determine when the work is done. To enable homeoffice, a suitable workplace with infrastructure must be available or access to technologies (e.g. Slack, Trello). So, why are employees or companies interested in homeoffice in the first place? Table 2 compares the advantages and disadvantages of homeoffice for employees and companies.

The disadvantages of homeoffice are primarily social isolation. Social isolation and the lack of personal interaction at work can lead to an increased level of stress as well as a drop in job satisfaction with increasing working hours (Bentley et al., 2016). Stress can also arise from the socio-spatial isolation of working from home and its impact on individual career

development. People working exclusively from home might lose personal contact with their colleagues (Baruch, 2000).

Homeoffice	Employees	Company
Advantages	Better reconciliation of work and private life, e.g. childcare or care for relatives (Gajendran & Harrison, 2007; Fonner & Roloff, 2010; Kossek et al., 2010)	Utilization of employees' competencies even in situations in which they are not available for private reasons (Cascio, 1999)
	Flexible scheduling (Olson et al., 1984)	Reduction of necessary office space
	Shortening the commute (Olson et al., 1984) and enabling certain groups of people (e.g., the physically impaired) to participate in the workforce (Baruch, 2000).	Reputation enhancement and opportunity to retain talented, motivated employees (Logsdon & Wood, 2002; Hackl et al., 2017; Hofmann et al., 2019).
	Independence from weather conditions (Olson et al., 1984).	Increasing employee motivation as well as work effectiveness (Olson et al., 1984; Angelici et al., 2020).
	Promoting personal responsibility and motivation (Olson et al., 1984; Barsness et al., 2005).	Eliminate location lock-in and improve the matching of job seekers and employers (Hill et al., 2003; Badura et al., 2017; Kopplin, 2020).
	Increase labor productivity (Bloom et al., 2015; Angelici et al., 2020).	Competitive advantages in employee acquisition (Mas & Pallais, 2017).
	Improving work-life balance (Kazekami 2020).	Promoting a culture of trust
	Increasing autonomy and flexibility (Allen 2015)	Accessing skilled workers from rural areas without requiring them to move to urban regions (Ovaska et al., 2020).
Disadvantages	Risk of social isolation (Allen 2015; Bentley et al., 2016) and expansion of working hours (Arntz et al., 2019).	Difficult coordination and increased organizational effort (Landes et al., 2020).
	Reduced informal information and loss of nonverbal cues and the synergies that come with face-to-face interaction (Cascio, 1999)	Challenge of assigning tasks and assignments and providing the necessary information (Cascio, 1999).
	Difficulty separating work and personal life (Allen 2015).	Limited control and monitoring capabilities (Landes et al., 2020).
	Lack of coordination, loss of motivation, loss of qualification, and creativity	High demands on data security and IT infrastructure
	High levels of stress, guilt, and overwork (Mann & Holdsworth, 2003; Becker et al., 2020)	Negative effects on the sense of community due to high absenteeism (Lal et al., 2009)

Table 2: *Advantages and disadvantages of home office.*

People working exclusively from home might lose personal contact with their colleagues (Baruch, 2000).

2.3.2.2 The Arbitrary Third Place

The Third Place primarily takes over advantages of the homeoffice (Table 2). In addition, the Third Place enables people to be more closely linked to their social environment, leads to a reactivation of services in rural areas, and enables compatibility with different life models of different generations (Huber & Rauch, 2013). However, working at the Third Place also has disadvantages. In order to be able to work in Third Place, fast internet access is essential, and users need to find suitable Third Places. These are precisely challenges that

digital workers, freelancers, and entrepreneurs are facing as they have increasingly shifted their work lives to modern post-bureaucratic working environments, the so-called coworking-spaces (Bouncken & Reuschl, 2017; Bouncken et al., 2020b). Coworking-spaces offer workspaces that have been upgraded in terms of design and technology, in which work can be accompanied by openness and a sense of community. Coworking as a new form of work integrates various elements of homeoffices, office communities, virtual work, and incubators, but in particular, offers a cross-sectoral work community with more flexibility, autonomy and opportunities for social interaction (Bouncken & Reuschl, 2018).

Thus, social isolation and the associated disadvantages of homeoffices can be largely compensated for. Coworking is more than just a physical workplace, as it allows participation in a sense of community (Garrett et al., 2017), innovative climate (Waters-Lynch and Duff, 2021), as well as design elements through, e.g., architecture that promotes creativity (Bouncken et al., 2021). Coworking offers creative and open space concepts for more community, flexibility, and spontaneity and promotes creativity, innovation, and entrepreneurship (Bouncken et al., 2020a).

2.4 HYBRID MULTILocal WORK AND ITS CONFIGURATION OPTIONS FOR SMES

2.4.1 The hybrid multilocal form of work

Despite numerous advantages of working mobile and multilocal between First and Third Place, there are also disadvantages. Companies need more organizational effort to coordinate and harmonise employees at their multilocal workplaces. The allocation of tasks and the provision of information are also significant challenges. Workers face disadvantages such as adverse effects on the sense of community, social interactions, or the loss of non-verbal cues and synergies that generally come with face-to-face interaction. In addition, the pandemic homeoffice wave has shown that employees do not want to work exclusively off-site.

Given these challenges and drawbacks, combining First-, Second-, and Third-Place seems to be an effective solution for companies and employees. Employees spend time in the corporate office, but they also have the flexibility to work from home or any Third Place. Such hybrid multilocal connections lead to structure and socialisation, as well as independence and flexibility, and shape the future of work (Mesmer, 2020).

Table 3 summarises the different hybrid concepts of work.

Term (subject)	Authors	Description
<i>Hybrid work (information technology)</i>	Müller et al., 2018	- Hybridity of work between humans and artificial intelligence
<i>Hybrid teamwork (Organization/management)</i>	Earley & Mosakowski, 2000	- Location-independent teamwork - Focus: a cultural and social perspective - Investigation of functionality and effectiveness
<i>Hybrid workplace (Organization/management)</i>	Halford, 2005	- Spatial reconfiguration of work so that work can take place at home or in the firm itself, mediated by virtual space
<i>Hybrid characteristics of work (Psychology)</i>	Xie et al., 2019	- Hybridity of the three work characteristics: task, social and context - Characteristics: <ul style="list-style-type: none"> - Boundlessness: The extent to which clear spatial and/or temporal boundaries between work and private life have dissolved - Multitasking: the need to accomplish several tasks in the same period - Non-work-related interruptions: Extent of incidents or events that hinder or delay the employee in completing work tasks - Requirement for continuous learning: The extent to which employees continuously familiarize themselves with technologies, knowledge, methods and applications in order to keep up to date with the latest developments

Table 3: *Hybrid concepts in the context of work.*

Even though the literature dealt with hybrid work to some extent, there is no uniform definition or integrated concept. Therefore, we propose the term hybrid multilocal work (HMW), which defines flexible work, whether in the company (Second Place), in the homeoffice (First Place) or in any Third Place. Hybrid multilocal work combines mobile, semi-mobile, and office-based work. With HMW, employees can choose how, when, and from where they want to work or what they need, for example, for creative or social processes. In this way, HMW empowers workers to change the physical boundaries of their work. This enables workers to organise and simplify their environment and minimise the stress caused by ill-defined work locations (Olson-Buchanan & Boswell, 2006; Bouncken et al., 2018).

Thus, HMW expands the level of location and time flexibility, the value orientation, and the sense-making of work, and it improves the combination of work and private life without adverse de-limitation effects. Through the associated participation and autonomy, there is a further shift of decision-making responsibility towards the employees. Based on the

classification of the place of work into First, Second, and Third Place, the question arises as to why employees prefer or choose different places of work.

Employees will primarily choose the homeoffice if, for example, there are time constraints and there are advantages to be gained from saving the commute or if work tasks are to be completed that require a high degree of concentration and work from the Second or Third Place does not allow this.

In contrast, in the digital age, with the experience of the pandemic, the purpose of going to the Second Place will change. The primary preferences of employees will be communication and interactive collaboration. Although there will not be classically designed office spaces, companies will make many of their office spaces more open, creative, and social. The creativity and innovativeness thus fostered will lead to increased productivity in creative tasks (Bouncken et al., 2021). One option is replacing traditional individual offices with open-plan ones, where the company typically provides team rooms and workstations in open areas. This concept is similar to CWS (Bouncken et al., 2021). Considerably, the creative design and atmosphere promote creativity and inspiration as well as the employees' productivity (Haynes, 2008).

Unlike the First and Second Place, the Third Place is a collective term for many places where work can be done. Accordingly, the reasons for choosing the Third Place are also different. We divide Third Places into two categories, CWS and other Third Places. The central focus of CWS is often the community, which is a source of creativity and inspiration through communication and interaction. Autonomy, participation, diversity, and shared knowledge creation are also central elements of CWS (Bouncken et al., 2020a). Thus, it is evident that employees choose CWS in HMW if they need high levels of creativity and innovativeness. Furthermore, in CWS, design concepts such as interior architecture, design and atmospheric effects can also lead to creativity (Bouncken et al., 2021). Within the category of CWS, a further differentiation can be made between urban and rural CWS. Urban CWSs offer good access to the transport network and are characterised by their urban location.

As the clientele consists primarily of founders and young entrepreneurs, this innovative and motivated community can be the reason for choosing an urban CWS as a workplace. Rural CWSs, in comparison, offer a very different working atmosphere. The proximity to nature allows for new, possibly ecological incentives for employees who want to do something for

their physical and mental health and work. Other reasons for rural CWS are also the combination of work and holidays.

Finally, the second category of Third Places comprises places where employees can choose to carry out their gainful activity but whose reason for existence is not the provision of jobs. This includes cafés, bars, hotel rooms and even tropical bathing paradises. Table 4 lists the possible work locations and reasons for HMW.

Classification	Location	When/Why chosen?
First Place	Homeoffice	<ul style="list-style-type: none"> - In the event of time bottlenecks, both work-related and private, e.g. due to savings on the way to work - When taking care of children or sick people - For appointments at home, e.g., tradesmen - For work tasks that require a high level of concentration - In case of symptoms of illness/unwellness
Second Place	Company: Open designed office space with free choice of place	<ul style="list-style-type: none"> - To promote personal creative exchange with colleagues - For teamwork - For creative tasks - For personal meetings - As a balance to the home office or third place - For inspiration through design and atmosphere
	Company: Classic office	<ul style="list-style-type: none"> - Alternative to home office for concentration tasks - For a social exchange with colleagues during breaks - For personal meetings - As a balance to the home office or third place
Third Place	Urban or rural coworking-space	<ul style="list-style-type: none"> - For creative tasks - For making new contacts (work-related, social) - As a balance to the home office or second place - For inspiration through community, design, atmosphere, meaningful architecture, etc. - On business trips - To promote physical and mental health through closeness to nature parallel to gainful employment
	Any other place (e.g. bar, café, hotel, resort)	<ul style="list-style-type: none"> - As a balance to the home office or second place - For inspiration - Purposeful due to travel - Combination of vacation and work (full-, part-time)

Table 4: Hybrid concepts in the context of work.

2.4.2 Hybrid Multilocal Configuration Options for SMEs

The introduction of HMW is intended to exploit more potential for flexibility, meaningfulness of work, and personal responsibility of employees. Closely linked to this is corporate change, which is meant to better meet the values and demands of employees in the modern world of work. In addition, it can enable companies to retain their employees in the long term and improve staff acquisition regardless of location. This is crucial for SMEs, which are often located in rural areas (Garkisch, 2020). On the other hand, organizational change also brings challenges. For example, SMEs need to consider the individual

preferences of employees. In the context of HMW, various areas of tension can be identified, which are summarised in Table 5.

Area of Conflict	Description
Hierarchy versus participation	Predictability, strict structures and security versus personal responsibility, autonomy and flexibility
Separation versus integration	Strict separation of work and private life versus integration and dissolution of boundaries
Time-oriented versus results-oriented work performance	Working hours versus the work result as an evaluation criterion for work performance
Meaningfulness versus subsistence	Meaningfulness of work versus work as the primary means of subsistence

Table 5: *Hybrid concepts in the context of work.*

The configuration options for SMEs can be classified on three different impact levels: Functional, cultural, and design.

2.4.2.1 The functional level

Due to the local and time-independent nature of HMW, SMEs should adapt their structures so that employees' flexibility and personal responsibility can be used. This requires decentralisation combined with a distribution of power. In order to ensure the quality of decision-making, it is advisable to introduce participatory decision-making processes. This gives employees the feeling of being able to participate actively and having their own knowledge and experience flow into the decision-making process. Together with effective knowledge management, this can create competitive advantages (Pyo & Bouncken, 2003). In addition, empathetic managers can help employees to reconcile work and private life better and create more trust. Nevertheless, SMEs should introduce a few formal rules and enforce them strictly. These should primarily formally regulate the organization of work, the distribution of work tasks, and the work to be done so that employees can organise their work flexibly according to their own needs and ensure a certain level of productivity (Kossek et al., 2010). In addition, the delivery of results-oriented work performance requires clear communication of work objectives and assessment criteria to be met within a pre-determined timeframe (Raghuram & Wiesenfeld, 2004).

2.4.2.2 The cultural level

Through the changes at the functional level, SMEs should also adopt common values, norms, and attitudes in regard to their requirements and needs (Schein, 1984; Schönebeck & Kratzer, 2010). For most SMEs, the introduction of HMW entails many innovations and deviations

from deeply rooted norms. First, the prevailing basic assumptions should be broken down and adapted in HMW. A changed basic assumption can be, for example, when and where work has to be done. Suppose the newly adapted basic assumptions have been communicated to the employees in the context of HMW, manifesting in values and behavior patterns. In that case, rituals can be initiated, such as a fixed virtual weekly meeting for exchange and drinking coffee together.

The effort in culture change is more effective when managers stand up for the changes and encourage employees to do so. Cultural change in SMEs becomes a challenge, especially when employees cling to old and sometimes rigid mentality patterns and old structures and processes, close themselves off from new influences and are afraid of making mistakes or have excessive hedging tendencies (Schönebeck & Kratzer, 2010). In the context of HMW, one of the things that needs to be built is a healthy culture of error that tolerates mistakes and encourages improvement. Creating a common digital identity can help SMEs ensure the informal exchange of tacit and proprietary knowledge about digital technologies (Bouncken & Barwinski, 2020).

2.4.2.3 The design/creativity level

The design level refers primarily to the Second Place and how it can meet the new requirements. This means that traditional spatial concepts need to be rethought. Physical proximity in space, created in openly designed space concepts, promotes communication and interaction, whereupon employees' creativity can be increased (Phillips & Remke, 2017). Even removing walls that previously separated employees can strengthen teamwork. Modern room partitioning systems can be used flexibly here, for example, to separate individual workplaces for a certain period and then integrate them back into the open space concept without much effort. Workplaces should be designed in such a way that productive work is possible. In addition to open space concepts similar to coworking, places for regeneration should be created so that employees can pursue their creative work in peace. SMEs should also invest in digital infrastructure and smart workplaces to support transformation (Vasiliki et al., 2020). Multilocality creates the risk of parallel worlds. This danger can be minimised through digital tools that connect spatially separated teams and enable a uniform level of knowledge.

2.5 CONCLUSION AND FUTURE DIRECTIONS

This paper introduces the concept of hybrid multilocal work. The steadily increasing flexibility of work, independent of time and place, and digitalisation allows work in First, Second, and Third Place. With hybrid multilocal work, employees can choose how, when, and from where they want to work. This article provides reasons why employees choose different places of work. Finally, the study identifies challenges for SMEs and presents configuration options on functional, cultural, and design levels.

Today's world of work is characterised by uncertainty as to how structures and processes in the framework of hybrid multilocal work should be best designed and deployed in the post-pandemic world of work. Future research should address this issue and investigate hybrid multilocal work through further conceptual and empirical research. First, empirical research might focus on an explorative research design to untangle the still hidden secrets of hybrid multilocal work by interviewing employees in SMEs who already work hybrid. We contribute to individual and organizational identity theories, offering a starting point for understanding how employees identify with the different places of work and which mechanisms lie behind them. The pandemic strongly influenced the change, so further adaptation by an identification development may occur as an enactment (Cloutier & Ravasi, 2020). The combination of exploratory interviews in case studies with assumptions allows the current Flexible Pattern Method (Bouncken et al., 2021a; Bouncken et al., 2021b).

Finally, we propose that different situations and/or typical work contents of employees need to be considered because they are likely to have different first-, second-, and third-place requirements. Studies can examine individual workplaces separately on the one hand and the holistic concept of hybrid multilocal work on the other. We further assume that more pronounced digital identities (Bouncken & Barwinski, 2020) in industries promote hybrid multilocal work. This will allow future studies to better contextualise and concretise the impact of hybrid multilocal work on employees.

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3 NEW WORK DESIGN FOR KNOWLEDGE CREATION AND SUSTAINABILITY: AN EMPIRICAL STUDY OF COWORKING-SPACES

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3.1 ABSTRACT

New Work, such as in coworking-spaces, offers greater task autonomy alongside permeable spatial, task, team, and leadership boundaries as compared to traditional work structures. New Work in coworking-spaces provides several advantages for sustainability and knowledge creation, yet it also faces competition and knowledge leakage risks. To understand the nexus of knowledge transfer and sustainability in New Work, we study the processes in coworking-spaces through interviews, observations, and secondary data. We compare environments with low- and high-sustainability targets of coworking-spaces. The results reveal that coworking-spaces can prime their audiences by exposing sustainability in their manifestos, communities, and physical spaces. Knowledge-sharing occurs in different zones of coworking-spaces in the forms of inspiration, problem-solving, synthesizing, and co-creation. The sustainability of coworking-spaces and knowledge-sharing therein is influenced by a shared community nested in the local environment. We develop a model of knowledge creation processes depending on the exposure of a coworking-space’s sustainability targets.

Key Words: Sustainability; Coworking-spaces, New Work, Greening, Knowledge Creation

3.2 INTRODUCTION

New Work (Bergmann, 2019; Bouncken & Gantert, 2021) facilitates greater task autonomy, decentralization, and new spatial solutions and, as such, less rigid and impermeable structural boundaries than traditional work structures (Bouncken & Aslam, 2021; Clayton, Feldman, & Lowe, 2018; Inkpen & Tsang, 2005; Valenduc, 2019). Coworking-spaces present a prominent form of New Work that challenges the formal bureaucratic logic of

organizing (Antoine, 2021; Bouncken & Tiberius, 2021; Pulignano & Stewart, 2008) by bringing forth the idea of a workspace that offers shared facilities, offices, and social spaces (Bouncken & Reuschl, 2018; Fuzi, 2015; Spinuzzi, 2012). Without the rigidity and security of industrialized work, persons even from different professional, functional, educational, cultural, and demographic backgrounds work collaboratively and share knowledge by building diverse and cross-functional teams, mentoring, coaching, and creating interdisciplinary joint projects (Antoine, 2021; Bouncken & Tiberius, 2021; Helmold, 2021; Kienbaum, 2017). The sense of community and shared resources facilitate knowledge exchanges and bring forth sustainability logic by encouraging the use of eco-friendly materials, reducing waste, and creating new economic opportunities (Aslam, Bouncken, & Görmar, 2021; Giudici, Reinmoeller, & Ravasi, 2018; Stevens, Moray, Bruneel, & Clarysse, 2015). However, coworking-spaces vary in terms of their pursuance of sustainability logic. Such logics strongly support the distinctiveness of ventures (Täuscher, Bouncken, & Pesch, 2021). Some coworking-spaces vigorously pursue and advocate sustainability by clearly defining their manifestos and hosting users from similar backgrounds (Giudici et al., 2018). Others focus more on the commercial viability of the space (Bouncken & Aslam, 2019; Rese, Kopplin, & Nielebock, 2020). We thus assume that knowledge creation and sharing processes would be different in coworking-spaces that openly pursue sustainability targets, as indicated in their narratives, as compared to spaces that do not have clear sustainability manifestos and host users from diverse professional backgrounds. This is especially true because the narratives of coworking-spaces influence their users and community development, providing a framework for social interactions and recursive legitimation processes (Bouncken, Brownell, Gantert, & Kraus, 2022; Bouncken & Tiberius, 2021). Similarly, through reduction in structural boundaries, New Work can raise issues such as knowledge leakage, competition, and stress in coworking-spaces (Bouncken & Gantert, 2021; Ritala, Husted, Olander, & Michailova, 2018; Zobel & Hagedoorn, 2020). Hence, New Work in coworking-spaces can contribute to sustainability logics and open knowledge transfer, which operate in complementary relationships, while the direct perception of competition or diversity might challenge the achievement of these benefits. In essence, coworking-spaces have poorly understood ways of supporting as well as impeding knowledge transfer, and the positive or negative relationships might hinge on the degree of exposed sustainability logics. Research on this issue is still fragmented and lacks empirical

insights. Thus, it is paramount to understand how New Work can foster sustainability while facilitating knowledge exchanges in coworking-spaces.

We address this question with a qualitative research design. In line with the principles of grounded theory (Corbin & Strauss, 2014; Strauss & Corbin, 1998), we conduct an inductive data analysis by adopting the constant comparative method (Cassell & Symon, 2004; Miles & Huberman, 1994a). We analyze data from observations and interviews and secondary data of coworking-spaces. For harvesting the effects from a sustainability logic context, we compare the knowledge processes in coworking-spaces that expose sustainability targets explicitly in their narratives with those where sustainability targets are not pronounced. We understand coworking-spaces as potential homes for the knowledge transfer space, thus leveraging the theoretical concept of a “ba” (Nonaka & Takeuchi, 1995), which is a shared space for knowledge-sharing relationships that permit its spiraling residence on explicit and tacit knowledge conversions. Our results indicate that coworking-spaces reveal sustainability in their manifestos, communities, and physical spaces. Knowledge transfer occurs across individual freelancers, entrepreneurs, and small and micro-enterprises (Font, Garay, & Jones, 2016). Remarkably, it differs depending on whether the sustainability targets of the coworking-space are pronounced or not and whether the diversity among coworking-space users is high or low.

Our study contributes to the literature on knowledge processes that reveal a real setting of the “ba” concept in New Work (Gourlay, 2006; Grunwald & Kieser, 2007; Nonaka, von Krogh, & Voelpel, 2006). Additionally, our findings contribute to understanding the physical contextualization of sustainability targets in New Work (Berglund, Bousfiha, & Mansoori, 2020; Bouncken & Aslam, 2021; Obloj & Zenger, 2017). This paper is structured as follows. We start with the theoretical background in the form of a literature review on New Work, sustainable coworking-space, and the socialization, externalization, combination, and internalization (SECI) model of new knowledge creation. Then, we describe the methods, followed by the results. Finally, we discuss the results, followed by a conclusion of the study.

3.3 THEORETICAL BACKGROUND

3.3.1 New Work and Sustainable Coworking-spaces

The notion of New Work necessitates the transformation of traditional work systems by integrating the elements of independence, freedom, environmental sustainability, humane

orientation, and community participation (Bergmann, 2019). The core values that New Work promotes are autonomy, self-determination, social responsibility, flat hierarchies, open and flexible office concepts, and home-office opportunities (Hackl, Wagner, Attmer, & Baumann, 2017; Helmold, 2021; Kienbaum, 2017). Triggers to New Work are globalization and digitization (Antoine, 2021) as well as the COVID-19 pandemic (Helmold, 2021). New Work departs from the formal bureaucratic logic of organizing (Antoine, 2021; Pulignano & Stewart, 2008) and supports knowledge-sharing among diverse and cross-functional individuals (Bouncken & Aslam, 2019).

Modern workspaces, such as coworking-spaces, fab labs, and makerspaces, are real examples of New Work that offer individuals well-being, building social capital, and alleviating environmental problems simultaneously (Bouncken & Reuschl, 2018; Fecher, Winding, Hutter, & Füller, 2020; Gantert, Fredrich, Bouncken, & Kraus, 2022; Plewnia & Guenther, 2018). Coworking-spaces engender a sense of community among professionals (Al-Omouh, Orero-Blat, & Ribeiro-Soriano, 2021; Garrett, Spreitzer, & Bacevice, 2017; Gerdenitsch, Scheel, Andorfer, & Korunka, 2016). Shared resources in coworking-spaces strengthen group and community cohesion, permit efficient use of resources by tapping into idle or underutilized capacity, and create new economic opportunities (Aslam et al., 2021). Individuals can independently opt for working individually or communally, define their own tasks and work routines, and achieve work-life balance (Orel, 2020; Spinuzzi, 2012). Such independence, freedom, and the possibility of community participation in coworking-spaces, as Bergmann (2019) argues, are more humanistic, fluid, and sustainable.

While coworking-spaces are proliferating at large, sustainable or green coworking-spaces have recently been on the rise (Giudici, Combs, Cannatelli, & Smith, 2020). Sustainable coworking-spaces have their specific ecological, social, or economic sustainability targets and might focus on individuals, ventures, and companies who adhere to those ideas (Dacin, Dacin, & Tracey, 2011; Seet, 2019). Sustainable coworking-spaces consciously behave to reduce their carbon footprint by using eco-friendly building materials, renewable energy sources, energy-saving office equipment, and waste reduction, and emphasize social values nested in the explicit mission (Stevens et al., 2015; Sumrin, Gupta, Asaad, Wang, Bhattacharya, & Foroudi, 2021). Real examples are the *Tech Hub* in London and the *Sustainable Valley* in Australia, which focus on sustainability-orientated workshops, resources, and partnerships (Seet, 2019). We thus assume that knowledge creation and

sharing processes would be different in coworking-spaces that pursue sustainability targets explicitly, as indicated in their narratives, from those where sustainability targets are not pronounced, and the study of these differences can facilitate sustainability research, guide policy advice, and inspire managerial activities.

3.3.2 SECI Model for New Knowledge Creation

New knowledge creation in an organization is a spiraling process of interactions between explicit and tacit knowledge with others, which enhances *individuals' capacity* to define a situation or problem, apply personal knowledge, and solve the problem (Nonaka et al., 2006). Explicit knowledge comprises words and numbers that can be systematically expressed and formally shared with others in the form of data, formulas, and specifications (Nonaka & Konno, 1998). In contrast, tacit knowledge is more personal and can hardly be formalized, communicated, and shared with others when direct co-presence is not given (Lam, 1997). The technical dimension of tacit knowledge comprises personal skills, crafts, and experiences called “know-how,” while its cognitive dimension is based on the beliefs, values, and ideals that are deeply ingrained and shape the way individuals perceive things (Cook & Brown, 1999; Nonaka & Konno, 1998).

Knowledge creation occurs in socialization, externalization, combination, and internalization (referred to as the SECI model) through knowledge conversion and transcendence processes (Nonaka & Takeuchi, 1995). Socialization involves the face-to-face interactions of individuals that enable an exchange of tacit knowledge due to physical and cognitive proximity (Bouncken & Aslam, 2019). Externalization demands individuals' transcendence to share tacit knowledge gained through socialization with others in the group by presenting it in explicit form for the understanding and comprehensibility of others in the group (Nonaka & Konno, 1998). Combination requires groups' transcendence to combine newly acquired knowledge with the existing organizational knowledge for its dissemination in explicit forms (Nonaka et al., 2006). Finally, internalization involves individuals' embodiment of explicit knowledge into tacit actions and practices (Nonaka & Toyama, 2003).

The knowledge creation process through SECI is facilitated by a common place—or “ba,” where the interactions between individuals and knowledge conversion occur (Nonaka et al., 2006; Nonaka & Konno, 1998; Nonaka & Toyama, 2003). “Ba” serves as a context for understanding the knowledge creation process with respect to time, space, and relationships

with others in physical (e.g., a meeting room), virtual (e.g., online community), or mental (shared ideas) space, or any of their combination (Nonaka et al., 2006) in four types: originating, dialoguing, exercising, and systemizing. Each “ba” provides a specific platform and corresponds to a specific SECI model step. Originating “ba” is a situation in which socialization takes place. During face-to-face interactions, individuals share their ideas, experiences, feelings, and emotions. Dialoguing “ba” permits individuals to externalize their tacit knowledge through conversation into common terms and concepts. Systemizing “ba” allows individuals to combine their tacit knowledge with the newly acquired explicit knowledge. Finally, exercising “ba” supports learning processes by converting explicit knowledge into tacit knowledge in the form of new concepts and work practices.

Different aspects of “ba” might emerge from interactions of individuals in a particular space and time (Balestrin, Vargas, & Fayard, 2008). Considering these different aspects can assist in understanding the new knowledge creation process (Nonaka et al., 2006; Nonaka & Toyama, 2003). The concept of “ba” supports understanding of the new knowledge creation process in coworking-spaces that lack formal hierarchies with minimal structures and no fixed membership. It aids in understanding differences in knowledge creation processes in coworking-spaces with (or without) sustainable manifestation. At key, coworking-spaces inform about the physical space of different aspects of “ba.” However, it is not understood how the shared space permits knowledge transfer and creation and how this might be associated with sustainability logics that relate to the community aspects and the design of the physical space in coworking-spaces.

3.4 RESEARCH METHODOLOGY

3.4.1 Approach and Data Gathering

To understand the complex and hidden relationships of knowledge transfers and their creation in a shared space, which might be influenced by sustainability logics, we applied an inductive research methodology (Cassell & Symon, 2004). Inductive research permits the collection of context-specific rich data and facilitates the development of theory in a relatively uncharted area (Strauss & Corbin, 1998).

In our multi-case study, we purposefully selected coworking-spaces that exhibit maximum variation with respect to their sustainability manifestations, design, community, size, and facilities (Williams, 2007). Relying upon the principles of appropriateness and adequacy, we

continued our data collection process until reaching a saturation point where further data collection did not bring any additional insights (Gaskell, 2000; Guest, Bunce, & Johnson, 2006). We collected data from fourteen coworking-spaces, with the number of users varying from 15 to 450, with no specific goals on sustainability to a complete focus on sustainable practices. To ensure anonymity, we used pseudonyms instead of the original names of the coworking-spaces. We started our data collection by visiting different coworking-spaces in Germany, where we observed the work and social practices of users.

In addition, we attended social (e.g., community dinner) and training events (e.g., workshops, seminars), where we interacted with the founders, community managers, entrepreneurs, and self-employed professionals in the coworking-spaces. We took field notes based on our observations; for example, we recorded how people interact with each other, how much time they spend, on average, on social interaction, what they talk about, how they feel while interacting with others, and how much time they spend on social and training events. These observations helped us develop two semi-structured interview guidelines—one for the providers and the other for the users of coworking-spaces. In the next step, we conducted interviews (in the year 2017–2018) with the founders, managers, and users of the coworking-spaces. Each interview, on average, lasted for 20–85 min. All interviews were recorded and transcribed verbatim on the day they were conducted. Their transcripts were also shared with the respondents for corroboration of their responses. We also utilized secondary data sources, such as event brochures, workshop materials, and publicly available Slack discussions, for the triangulation of evidence (Williams, 2007).

3.4.2 Data Analysis

Our combined data comprised more than 1200 pages, including field notes, interviews, and publicly available data. We adopted a constant comparison method for qualitative data analysis (Miles & Huberman, 1994b). This process started with data collection, followed by data reduction until the emergence of common themes and verification (Glaser, 1965; Miles & Huberman, 1994b). Figure 3 provides an overview of the data structure. In the first stage, two researchers independently and carefully read all interviews and field notes and coded the transcripts line-by-line (Strauss & Corbin, 1998). These codes were akin to the notion of the open-coding technique (Böhm, 2004). Open codes were used to define first-order concepts (Gioia, Corley, & Hamilton, 2013; Langley & Abdallah, 2011).

ID	Space Name - Pseudonyms	Area (SQM)	Physical Aspect of the space	Total No. of Users	Community Characteristics	Sustainability Manifesto
1	Eco-work	860	<ul style="list-style-type: none"> · Old U-shaped building with open space in the middle. · A maker space focuses on jewelry · Large open office areas, private offices, social lounge, and phone booths 	150	Startups and people working on social innovation	Eight focus areas are: education; health; community development; economic opportunities; arts and design; social justice; green environment; city planning
2	Work-desk	930	<ul style="list-style-type: none"> · A modern building consists of five floors · Floors are divided into event space floor, open office area, private offices, and a social lounge on the rooftop 	120	Open for all	Promote responsible business practices with profit
3	Factory	460	<ul style="list-style-type: none"> · Situated in the city center · Private offices, a little library, and a kitchen 	18	Freelancers, micro-companies, nonprofit association	To deal with socioeconomic challenges
4	Village	600	<ul style="list-style-type: none"> · Five office spaces, an open area, and a social lounge · A hardware lab consists of 3D printers and other equipment 	<40	Startups	No specific goals about sustainability
5	Impact	640	<ul style="list-style-type: none"> · Large open office space · Private offices, library, meeting room, cafeteria 	73	Social entrepreneurs and environmental intrapreneur	Bring positive impact on the community
6	Cube	174	<ul style="list-style-type: none"> · Open office area, social space, a meeting room, and a kitchen 	15	Versatile professional	Provide solutions to the social issues
7	Yacht	560	<ul style="list-style-type: none"> · Open office area consists of different zones, a kitchen, social areas 	40	Social entrepreneurs and innovators	Healthy and sustainable food practices
8	Warehouse	1300	<ul style="list-style-type: none"> · Open office areas, private offices, and a large event space 	>50	Small & nonprofit businesses	Local community development
9	Design	1700	<ul style="list-style-type: none"> · Aesthetically designed space · Several open office areas, private offices, and a large event space 	~450	Freelancers, NGOs, and large companies	No specific goals about sustainability
10	Place	1500	<ul style="list-style-type: none"> · Open office areas, meeting rooms, and a common area 	350	Freelancers, entrepreneurs, startups, and micro-companies	To provide education on social issues
11	Color	511	<ul style="list-style-type: none"> · Vibrant open interior with the possibility to partition of the large hall according to the need · Social lounges include a café and a kitchen 	112	Entrepreneurs and freelancers	To create a positive impact on society.
12	Zone	400	<ul style="list-style-type: none"> · Standardized space with an open office area, meeting rooms, and a café 	90-120	Social sector individuals and organizations	Provision of affordable office space
13	Corner	370	<ul style="list-style-type: none"> · Three open office areas, meeting rooms, pantry, kitchen 	30	Freelancers, entrepreneurs, startups	No specific goals about sustainability
14	Mansion	350	<ul style="list-style-type: none"> · Space consists of three floors of open workspaces with common areas on each floor and an outdoor working area 	< 100	Freelancers	Green economy based on rural based business

Table 6: Characteristics of Coworking-spaces

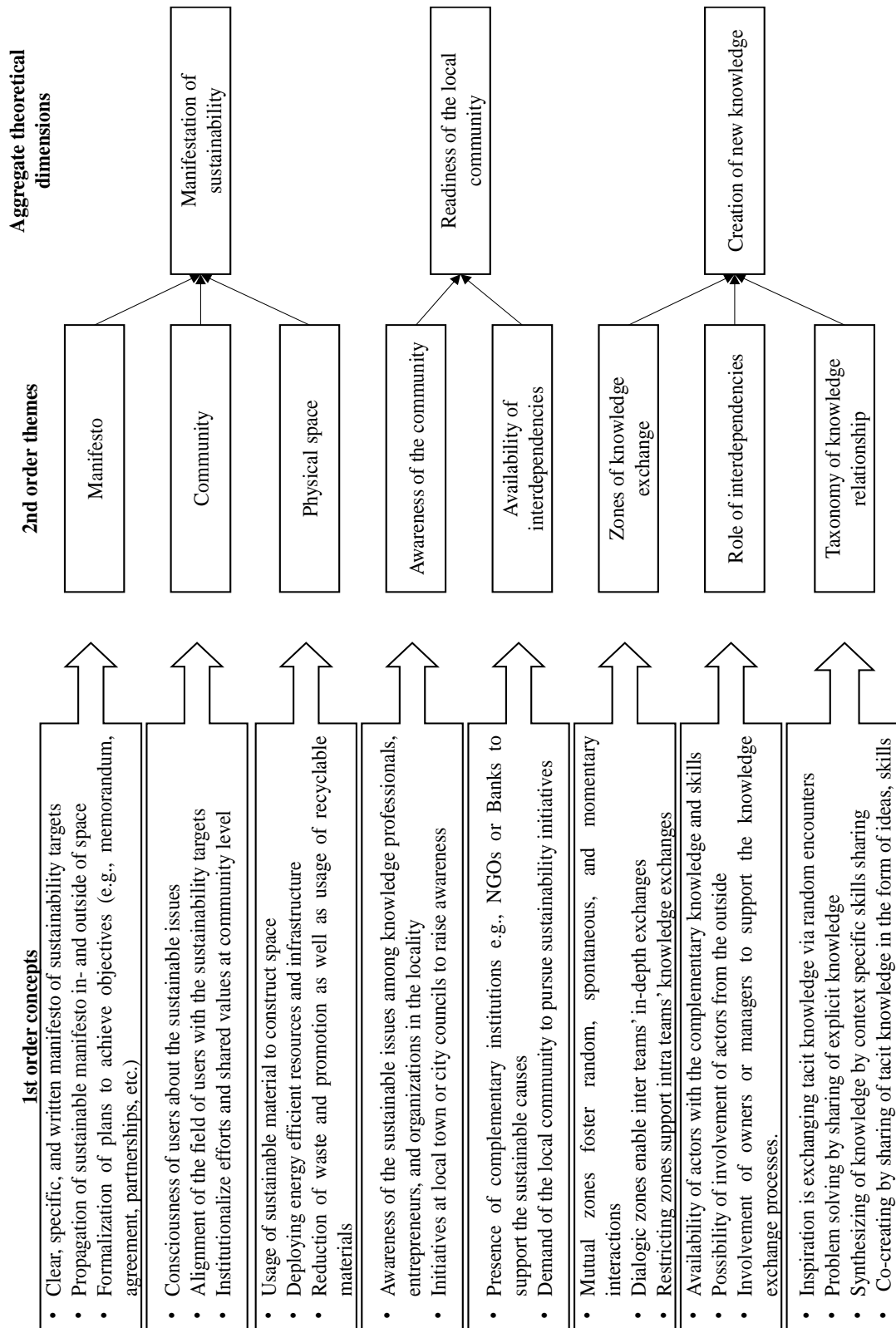


Figure 3: Overview of data structure.

In the second stage, we identified similarities and differences in the first-order concepts and defined second-order themes (Gioia et al., 2013). In the final stage, we aggregated second-order themes to define the higher-order theoretical dimensions. Throughout this process, we continuously consulted existing literature and refined our second-order themes and theoretical dimensions accordingly (Corbin & Strauss, 2014; Mäkelä & Turcan, 2007).

We took several measures to ensure the reliability and validity of our findings (Golafshani, 2003; Morse, Barrett, Mayan, Olson, & Spiers, 2002). First, we collected data from three different sources through personal observations and interviews with the founders/managers and users of each coworking-space. We compared our data with secondary sources, such as publicly available Slack channels, marketing and event brochures, and social media. Second, we shared the interviews transcripts with the respondents to seek confirmation of their responses and to enhance the validity of our data. Third, an intercoder assessed our codes, which were discussed and revised.

3.5 FINDINGS

3.5.1 Manifestation of Sustainability in Coworking-spaces

Coworking-spaces that follow a social responsibility logic tend to manifest sustainability at three levels: i) by clearly forming, writing, and promoting their sustainability objectives and goals, ii) by targeting users that have a conscious commitment to sustainable issues, and iii) by practicing sustainability through the use of renewable energy resources, waste reduction, and recycling.

Manifesto

The coworking-spaces following sustainability logics tend to have a clear, specific, and written manifesto of sustainability targets – a clear narrative. For example, the manifesto of Design is, “*we are trying to make projects to make a big difference*” [Design]. The commitment to the manifesto varies from one coworking-space to another. Some coworking-spaces are highly committed to achieving their sustainability objectives as the founder of Design described, “*first thing... we inspire, we connect, and we label ourselves as social entrepreneurs. So, we try to make all our activities related to that. We do not define ourselves as coworking. We are a community. We provide our members of course a place to work but it's not what we are*” [Design]. A clear manifesto specifies target-specific goals and ways to achieve them. A clear and specific manifesto increases distinctiveness and support from

nearby communities, thus gaining new members, partners, or resources. The manager of Eco-hub stated, *“it's one of our goals is to improve health and financial equity in the city. So, what we are trying to do in this space is actually to build access to resources and to build connections for people that might not be otherwise not getting it”* [Eco-hub].

Other coworking-spaces include sustainability issues in their manifesto but seem to be less committed because not all potential customers might value sustainability and perhaps might even not be admitted. This leads to the dilemma of “sustainability and scalability.” The founder of Work-desk stated, *“We have a community of social entrepreneurs, impact investors, and people who more generally are focused on what I would call responsible innovation. We are not in a thriving economic context and we do not want to be reliant on non-profit. So, we are more towards profit...”* [Work-desk].

Community

Coworking-spaces can develop a sense of community but can also be tied to the normative and local community in which they are located. When coworking-spaces emphasize sustainability, they might appeal to some of their users but might also repel others. Hence, there can be a dilemma of “sustainability and scalability.” In this vein, coworking-spaces that offer membership without any admittance criteria might channel fewer membership selection processes through consciousness on ecological, economic, and social issues. Yet, such coworking-spaces targeting users aligned with sustainability targets are more likely to develop shared values at their community level. The awareness and motivation of a founder toward sustainable issues greatly influence the type of community. Highly conscious and motivated individuals are more likely to raise the community of users who are also environmentally conscious compared to their counterparts, as the founder of Color reported, *“in a city like ours which is full of challenges, problems, and social needs—we cannot remain ignorant of the situation. So, we do have a special focus on social entrepreneurs, social innovators, change-makers, or entrepreneurs that really want to create an impact in our society”* [Color].

Physical space

The commitment to sustainability encourages designing an eco-friendly space with a minimum carbon footprint, for example, by using sustainable or eco-friendly materials. The founder of Eco-work described, *“we have a very strong mission of creating positive change*

and also sustainability, so we want to incorporate as much as possible, reclaim materials, low impact materials, recycle materials, etc.” [Eco-work]. Similarly, an entrepreneur from the coworking-space Color described, *“it is a very colorful place with open areas, with a lot of recycled materials. They used a lot of pallets, wood pallets to construct walls and ceilings and divisions between rooms. They used this huge cable that comes in industrial wastes to construct tables”* [Color]. Coworking-spaces can continuously support sustainability by energy-efficient shared infrastructure (e.g., lighting, air conditioners, printers, etc.) and reduction of waste through the use of recyclable and reusable goods.

3.5.2 Readiness of the Local Community

Coworking-spaces are nested in a local environment. They provide socio-economic dynamics and micro-ecosystems, and the local community’s sustainability readiness influences a coworking-space’s decision of whether to pursue sustainability pathways. The readiness of the community can be gauged by i) awareness of the community regarding sustainability and ii) availability of interdependencies that can support sustainable ventures.

Awareness of community

The awareness or knowledge of a local community outside the coworking-spaces depends on the overall economic situation, local environment, the presence of NGOs and social activists, and the commitment of governmental institutions to raise awareness about sustainability issues. Coworking-spaces situated in a local sustainability community receive better support and resources. Our findings suggest that coworking-spaces’ sustainability logics need to adjust their objectives when they lack support from the external community. The key reasons are unawareness and lack of interest in the sustainability of the surrounding target audience. The founder of Zone explained, *“sometimes they don’t even understand themselves as social entrepreneurs but when you start talking... you discover that they are creating a lot of impacts and they don’t even notice”* [Zone].

Availability of interdependencies

The presence of institutions (such as banks, venture capitalists, angel investors, NGOs, entrepreneurs, and micro-enterprises) and the local community’s demand of sustainability issues can support coworking-spaces attaining their sustainability goals by connecting relevant stakeholders, as a community manager of Yacht pointed out, *“everybody can create an impact in our society. I would say that the main challenges that they have sometimes are*

access to capital, especially in the very early phases, and sometimes access to coaching and mentoring. We have tried to cover that by offering programs that are tied to the type of needs” [Yacht].

However, these intermediaries are not entirely supportive. An entrepreneur working in Work-desk reported, *“every bank is developing a new impact investing arm and they want their employees to immerse themselves in the world of social impact but a lot of those employees don't know where to go to do that” [Work-desk].* When the intermediaries are not ready, they cannot harvest the full potential of coworking-spaces in their ecosystem, as the entrepreneur further stated, *“I think that today many people build businesses and then decide to add a social impact as a sort of side component of what they do...They impact their communities and the environment as a deeply ingrained piece that is baked into the fabric of the entire system and I think that one of the challenges they face at the earliest stages of their development is they could not find resources to start” [Work-desk].*

Similarly, the lack of demand from interdependencies can also discourage coworking-spaces from sustainability. The founder of Impact described their struggle due to the limited number of users and lack of involvement from outside users: *“We are going to start mediation here next week in the space. But it is hard because we have to pay directly to the trainer and it is very hard to fund. We have tried it with yoga before” [Impact].* The lack of interest from the local community working in coworking-spaces shapes a survival challenge, as indicated by the founder of Village: *“How can we attract people here that is one of the biggest challenges. We are continuously developing new events and attractions to renting” [Village].*

3.5.3 Creation of New Knowledge

Coworking-spaces can operate as an engine of new knowledge creation where independent knowledge professionals work side-by-side with entrepreneurs, small and micro firms, and employees of large corporations. Coworking-spaces represent a “ba” where new knowledge is created through socialization, externalization, combination, and internalization (Nonaka, Toyama, & Konno, 2000). Physical and design elements shape interactions and knowledge exchange in coworking-spaces. Availability of complementary knowledge and skills, as well as specific support from the coworking-space provider, can help create new knowledge. Hence, we structure our findings into i) zones of knowledge exchange, ii) role of interdependencies, and iii) taxonomy of knowledge relationships.

Zones of knowledge exchange

We divide a coworking-space into three zones based on the configuration of the design elements and knowledge-sharing practices that take place in a) mutual, b) dialogic, and c) restricting zones. Mutual zones allow face-to-face interactions and engender spontaneous, random, less embedded, and without context brief social interactions, such as shared open-plan office areas, corridors, and social spaces. (e.g., lounges, cafés, kitchen, open spaces). A user of Corner stated, *“kitchen is probably the place where most of the people get to meet. So, it's really a place for encounters”* [Corner]. Shared infrastructure and resources facilitate interactions. Using a coffee machine spontaneously with others permits random discussion. A freelancer from Mansion described, *“it's very casual, people have a drink, they can have a beer whatever it's quite short, it's fun and they get to connect with other people”* [Mansion]. Dialogic zones enable exchanges among groups of persons, as for planned, structured, purposeful, deliberate, and context-specific interactions. Event spaces permit social gatherings, workshops, or training programs that facilitate in-depth exchanges. The manager of Zone stated, *“we have some sessions, some workshops here [pointing event space]. These are mostly idea generation sessions or workshops or like working with investors to teach people how to share, identify with their ideas, and how to make these ideas happen”* [Zone]. Restricting zones in coworking-spaces are private offices, meeting rooms, phone booths, or spaces where access is restricted to the relevant individuals or team. In these spaces, interactions and knowledge exchanges occur among specific individuals, intra-teams, or intra-groups. The relationship manager of Factory reported, *“they [employees of firms who work in private offices] usually don't like to stay in the open space or common areas. They really use this a lot for company meetings or other meetings, or they use the event space a lot for their own purpose”* [Factory].

Role of interdependencies

Interdependencies of coworking-spaces, such as the availability of actors with complementary knowledge and skills, involvement of external knowledge partners, or institutionalization, support knowledge creation processes. Some coworking-spaces host users from diverse functional backgrounds, while others only accept users from a particular background. The founder of Yacht follows sustainability targets, *“we want people who share the same vision on like having a positive impact”* [Yacht], while others that are operating commercially are more likely to host diverse communities. Similarly, coworking-spaces can

prefer people from a certain domain (e.g., technology), occupational group (e.g., artists), or firm (e.g., Microsoft). The presence or absence of individuals from diverse backgrounds is two-fold. Individuals from the same background can easily exchange domain-specific knowledge, yet novelty might be low or limit creativity. An entrepreneur from Design suggested, *“the plus point of this space is that we have people from different industries and you learn a lot from each other”* [Design].

Coworking-spaces can involve temporary users (e.g., from universities, research and development institutes). The director of Impact explained, *“we do social entrepreneurship festivals. We do it with universities. We also have another program with universities that is called “pitch for impact” and we work with the teachers, with the administration, and academic directors to enable them with some capacities that we allow them to bring entrepreneurship or something transversal”* [Impact].

Coworking-spaces support knowledge exchanges through training programs or by bringing in consultants, mentors, or successful business owners. For example, an entrepreneur from coworking-space Place stated, *“if you want to connect with others, they can help you to connect. You can also do it through an app. Besides, we have common meals on Tuesday. They also arrange workshops where people can share their knowledge. You define a topic and invite other members to join. They also have the business clinic so if you have certain issues connected to either finance, tax, or business”* [Place].

Taxonomy of knowledge relationships

We identify knowledge-exchange relationships that lead to inspiration, problem-solving, synthesizing, and co-creation in coworking-spaces.

Inspiration is the most basic knowledge-sharing process during spontaneous encounters with other actors in coworking-spaces. These random, unplanned, and often brief encounters take place in open-plan office spaces or common areas. Our findings suggest that independent professionals or freelancers spend more time on random socialization than others. A user of Work-desk stated, *“freelancers are of course a growing population. They have a strong need for social interactions and relationships”* [Work-desk]. These social interactions usually comprise general discussions, sharing of past experiences, and storytelling that facilitates tacit knowledge exchange. An entrepreneur from Warehouse described the inspiration as

“these interactions consist of storytelling of experiences, sharing success or failure stories of a venture, or how they reached to the point where they are” [Warehouse].

Problem-solving becomes easier through the spatial collocation of actors from diverse professional backgrounds. Direct access to relevant personnel and simple procedures of inquiring and feedback makes the process easier for users. Actors can seek guidance from the community; ask for help from a coach, mentor, or consultant; or participate in a workshop. Coworking-spaces that host users from a specific domain seem to achieve easier problem solutions from the exchanges among experts in the field. A founder of Zone stated, *“we are catering to a particular type of user or client. Many of whom are working on. It's sort of a cross-spectrum i.e., enhancing livelihoods, improving social services, filling gaps where public services and infrastructure don't work, delivering service or products to the last mile, to rural areas in the country. Those are the kind of things that our members work on and there are natural synergies amongst and between them as they tackle these problems many of them lie in. Just knowledge sharing as you don't have to reinvent the wheel every time you need to figure out a new whole distributions strategy and many other things lie in more practical elements around...”* [Zone].

Synthesizing describes explicit and context-specific knowledge exchange between actors with specific backgrounds forming teams and operating in private offices or meeting rooms. Each partner contributes specific knowledge that requires agreements and contracts to proceed. Partners share explicit, task-specific, and articulable knowledge to accomplish specific objectives. As the founder of Factory described, *“companies use professionals to solve their problems or to do some part of the job. So, it is sort of horizontal cooperation in projects, where all the members are involved on the same level”* [Factory]. Synthesizing is the flexible arrangement of knowledge-and skill-sharing, where every partner plays their role by contributing their specific knowledge. Coworking-spaces with a strong manifestation of sustainability and users from specific backgrounds might not contribute much to synthesizing processes as compared to spaces that are open for all.

Co-creation involves new knowledge creation when actors share their ideas, invite others to give feedback, and involve relevant stakeholders to pursue creative and novel ideas. It involves long-term agreements among the participants. An entrepreneur from coworking-space Eco-work explained that co-creation involves *“...to start listening to different opinions and different generations that have another dynamic in their whole work and that's what I*

see in corporations so it's a very good way to start acquiring potentially innovation by learning from each other" [Eco-Work]. Co-creation occurs in-between the partners' in-and outside of the coworking-spaces, which involves purposeful discussions and detailed deliberations with all stakeholders to devise novel solutions. As a user of Corner mentioned, *"an open and engaging crew and creative community is a very important part"* [Corner]of creating dialogue and building engaging processes of co-creation.

3.6 DISCUSSION

The purpose of this study is to examine how New Work can contribute to sustainability logics and knowledge-sharing and creation that operate in complementary relationships in coworking-spaces. Using a multi-case study approach, we compared the knowledge processes in coworking-spaces that pursue sustainability targets explicitly, as indicated in their narratives, with those where sustainability targets are not pronounced. We found that coworking-spaces move beyond the use of narratives and expose sustainability in their manifestos, communities, and physical spaces. The availability of interdependencies (e.g., financial institutions supporting sustainable ventures) and awareness of the community in the locality determines whether to pursue sustainability goals. Knowledge-sharing takes place in different zones of coworking-spaces. The intensity and depth of these relationships assist new knowledge creation through inspiration, problem-solving, synthesizing, and co-creation.

While coworking-spaces often accommodate green and sustainable policies (Orel & Kubátová, 2019; Seet, 2019), they differ according to the degree of sustainability. Our findings show that sustainability can be espoused in the coworking-space's manifesto. Additionally, spaces might accept only members who pursue social, economic, or ecological goals (Fricker, 1998; Turcu, 2013). A few highly committed coworking-spaces demonstrate their commitment by using eco-friendly or recycled materials in their construction, utilizing renewable energy generation sources and energy-saving equipment, and reducing waste by encouraging the use of reusable materials. Yet, the commitment to achieving the sustainable targets might challenge their survivability when the community in the local environment is less inclined toward sustainability or when complementary institutions (e.g., banks and NGOs) are not available to support the social entrepreneurs or sustainability ventures. Consequently, people in the locality might not be motivated to join a coworking-space that pursues sustainability targets.

Our study clarifies that the sustainability disclosure of a coworking-space might be more economically viable (Hussain, Rigoni, & Cavezzali, 2018; Seet, 2019). Hence, we first contribute to the emerging theory on sustainability scholarship in the context of shared workspaces and New Work. Second, we reveal that coworking-spaces following a high degree of sustainability commitments are more likely to engage with community leaders, local NGOs, and activists to seek their support to work for the welfare or development of the local community, town, and city, as well as to engage in the knowledge-sharing process in the coworking-space. These sustainability-oriented coworking-spaces also host ventures, innovators, or professionals who work in the sustainability domain. On the one hand, this arrangement enables actors to share their visions, ideas, and experiences in the open and frank atmosphere of coworking-spaces, enabling the exchange of tacit knowledge (Van Baalen, Bloemhof-Ruwaard, & Van Heck, 2005; Nonaka et al., 2006). Spatial collocation of actors from specific domains also supports knowledge exchange of problem-solving and synthesizing (Bouncken & Aslam, 2019). On the other hand, focusing on one particular sector can reduce diversity and the conglomeration of skills that are necessary for inspiration and co-creation (Bouncken, Aslam, & Qiu, 2021; Clayton et al., 2018; Rese et al., 2020). Thus, coworking-spaces committed to sustainability can better serve ventures based on sustainable issues due to an in-depth tacit knowledge exchange, but the serendipitous knowledge exchange across domains might be limited. Conversely, coworking-spaces that are less inclined toward sustainability tend to involve professionals from different domains. The knowledge creation in a coworking-space is strongly characterized by peer-to-peer mentoring and coaching yet focusing on explicit rather than tacit knowledge transfer. Figure 4 illustrates our process model, which considers different configurations of knowledge processes depending on the sustainability logics of the coworking-space and the heterogeneity of the logics present.

Our findings extend knowledge creation theory (Nonaka et al., 2006; Nonaka & Takeuchi, 1995) and that the interaction of social actors (e.g., freelancers, knowledge professionals, entrepreneurs, etc.) with material elements (e.g. shared resources, social areas) forms in knowledge sharing routines (Bouncken et al., 2021). Material artifacts influence the nature of interactions and determine the intensity and depth of knowledge exchange (Bouncken & Aslam, 2021). For example, casual and random interactions in coworking-spaces lead to momentary inspiration (Faraj, Jarvenpaa, & Majchrzak, 2011).

More planned interactions bring motivation to work on creative and novel ideas together. Hence, coworking-spaces can enhance knowledge-sharing and collaboration among actors by using artifacts that extend the duration of interactions; for example, a high-tech lab might increase collaboration among individuals in the technology sector.

3.6.1 Limitations and Future Research

There are certain limitations to our study. We advocate that coworking-spaces facilitate knowledge relationships among diverse stakeholders. Diversity might have advantages with respect to creativity and innovation but is also confronted with challenges of different expectations. We did not consider diverse expectations that can influence the knowledge-sharing dynamics in coworking-spaces and recommend this for future studies. Similarly, professionals aim to achieve breakthroughs while working on their creative and novel ideas in the shared environment of coworking-spaces. These can seek support, guidance, inspiration, or solutions to their problems. This close liaison can cause conflicts, such as copyrights or patent issues. Our study did not include knowledge protection, which can be aggrandized when people share workspaces. Further studies can look at how to protect knowledge while sharing it, which can help to address these potential challenges and provide interesting insights for owners, managers, and policymakers of coworking-spaces. Finally, we did not consider the use of digital technologies (e.g., matchmaking tools; Kopplin, 2021; Kopplin, Gantert, & Maier, 2022) to support community development and knowledge creation in coworking-spaces, which can also be addressed in future research.

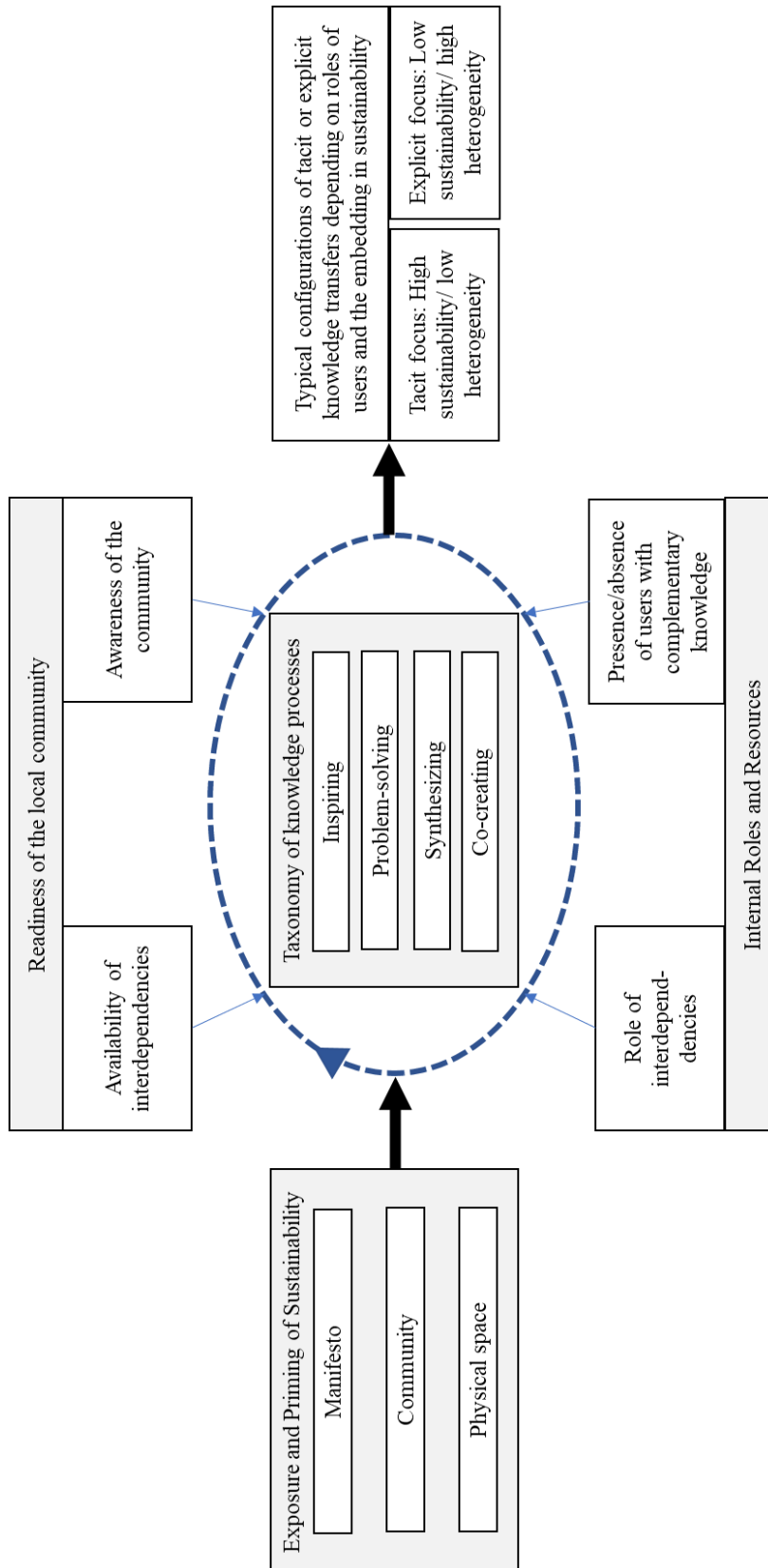


Figure 4: Process Model.

3.7 CONCLUSION

New Work has been proliferating in current societal, digitalization, and pandemic shifts. In particular, coworking-spaces not only provide freedom to the users to work autonomously in shared office spaces while interacting and exchanging knowledge with other professionals and creative workers but also increase sustainability by reducing costs for commuting, heating costs, and efficient use of the space. This is the first study on the nexus of New Work, sustainability, and knowledge exchange. Our empirical findings yield several factors and relationships that potentially influence the relationship between knowledge transfer and sustainability in coworking-spaces. Our key result is that knowledge transfer differs according to the degree of diversity of coworking-space users and whether the coworking-space propagates sustainability logics, as in their narratives or interior.

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4 CONTEXTUALIZING FOUNDER IDENTITY IN COWORKING-SPACES

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4.1 ABSTRACT

Coworking-spaces – which combine an office workspace with a social space – enable collaboration, creativity, and knowledge exchange, and offer opportunities to develop social and professional networks for users. Using a multilevel approach, we integrate data from two sources – at the level of the coworking-space (N = 57) and the entrepreneur (N = 317) – and apply SEM to test our hypotheses. Our study finds that innovation-based narratives generated by coworking-space providers significantly influence new venture growth for entrepreneurs within the space. The results also show that the alignment between the entrepreneur’s identity and the perceived social structure of a coworking-space (the immediate entrepreneurial space) positively influences new venture growth. Taken together, we propose an extension to the founder identity literature by integrating psychological and sociological theories of identity to explain how the reciprocal relationship between context and identity is critical to new venture performance.

4.2 INTRODUCTION

Coworking-spaces, which reflect a unique social and physical context, allow for greater autonomy, flexibility of work, and facilitate creative processes of and among the diverse users, which can include remote workers, employees or teams for project work, freelancers, and/or entrepreneurs (Bilandzic & Foth, 2013; Bouncken & Aslam, 2021; Bouncken & Reuschl, 2018). Similar to incubators, accelerators, and makerspaces, which offer significant advantages to innovation and entrepreneurship (Aldrich, 2014; Bergman & McMullen, 2021; Gantert, Fredrich, Bouncken & Kraus, 2022; Kambil, Eselius & Monteiro, 2000), coworking-spaces enable collaboration, creativity, and knowledge exchange (Bouncken & Tiberius, 2021). As a social space combined with a workspace, coworking-spaces provide opportunities for entrepreneurs to develop their social and professional networks (Vidaillet & Bousalham, 2018; Kopplin, Gantert & Maier, 2021) and to form social-emotional ties that

bring a sense of community (Garrett, Spreitzer & Bacevice, 2017; Waters-Lynch & Duff, 2021). However, the heterogeneity in and across coworking-spaces suggests that not all entrepreneurs are equally successful, and not all new ventures experience growth, when embedded within this specific context (Cheah & Ho, 2019; Cabral & Van Winden, 2020; Spinuzzi, Bodrožić, Scaratti & Ivaldi, 2019; Vidaillet & Bousalham, 2018; Bouncken, Aslam & Reuschl, 2018). Due to the fundamental importance of identity for entrepreneurs, we suggest that success and failure are specifically tied to the alignment or misalignment between an entrepreneur's identity and the context (Foy & Gruber, 2021). While research has attended to characteristics of coworking-spaces that influence entrepreneurial outcomes (Bouncken, Ratzmann, Barwinski & Kraus, 2020; Cheah & Ho, 2019; Howell, 2022; Kraus, Bouncken, Görmar, González-Serrano & Calabuig, 2022; Orel, 2019; Sargent, Yavorsky & Sandoval, 2021; Waters-Lynch & Duff, 2021), scholars have yet to explore how individual characteristics, such as identity of the individuals or the decision of the providers, can actuate entrepreneurial action and nurture the various factors that promote venture growth.

The purpose of this paper is to examine the interplay between the provider-generated context of coworking-spaces, the founder identity of those entrepreneurs embedded within, and the growth of their new ventures. We apply the lens of founder identity theory (Ashforth & Mael, 1989; Gruber & MacMillan, 2017; Powell & Baker, 2017) to explore these relationships, which is specifically influenced by the sense of community and the sense-giving efforts made by the provider in their narratives (Bouncken & Tiberius, 2021). Founder identity theory is well-suited to our research questions because entrepreneurs are embedded within social structures and identification processes that enable and constrain their actions (Grimes, 2018; Newbery, Lean, Moizer & Haddoud, 2018). Social identities define the entrepreneurs' journey as they guide founders in locating or defining the self within their social world (Ashforth & Mael, 1989; Gruber & MacMillan, 2017; Powell & Baker, 2017). In coworking-spaces, the physical presence of entrepreneurs and the copresence of different individuals provides a specific context for social identification that is characterized by recursive legitimacy processes (Soublière & Gehman, 2019; Bouncken & Tiberius, 2021). Coworking-space providers influence the initial selection of processes and expectations of users, primarily via their narratives and physical characteristics (for example, interior and facilities). Once in the space, users behave according to their expectations and both influence each other and are influenced by the social context, which influences others and the coworking-space providers (Bouncken & Tiberius, 2021). In this way, the narratives

generated by coworking-space providers are key to social processes and outcomes because they channel the selection processes of users, influence expectations of behavior, and regulate the actions of coworking-space users. In this way, the narrative has the potential to directly and indirectly shape the complex environment of a coworking-space and new venture growth for those entrepreneurs embedded within (Humphreys & Brown, 2001). Taken together, we integrate founder identity theory with social theories of identity to develop a conceptual model that explores how coworking-space narratives align with founder identity types and sense of community and the consequential influence on venture performance.

Our mixed-methods study consists of a multilevel structural equation modeling approach, using secondary provider-level and primary user-level data. Provider-level data is gathered via computer-aided text analysis (CATA), which is used to collect provider-generated narratives. We focused on innovativeness within the narrative, as innovation is a key primer of behavior within entrepreneurship that unfolds through supporting new ideas, novelty, mentation, and creative processes within the context of the space (Lumpkin & Dess, 1996; Pidduck & Clark, 2021). Primary data is collected through a survey questionnaire at both the provider level and the user level, allowing us to examine the direct relationship between innovativeness and new venture growth, as well as a variety of factors that influence this relationship. Our results from 317 entrepreneurs in 57 coworking-spaces show that high levels of innovativeness in the provider-generated narrative have a direct and positive effect on venture growth for entrepreneurs embedded within a coworking-space. We find that the level of innovativeness in the provider-generated narrative positively moderates the relationship between identity and new venture growth, and that a sense of community mediates the relationship between identity and new venture growth. Further, we demonstrate that innovativeness has a moderated mediation effect on the relationship between the Darwinism identity and new venture growth.

Our findings offer several important contributions to the literature. First, we contribute to research on the effects of narrative in coworking-spaces (Gantert et al., 2022) by showing that the founder-provided narrative influences the venture growth of the entrepreneur (the user) in the space. Second, we extend prior research on identity in entrepreneurial support organizations (Bergman & McMullen, 2021; Bouncken & Tiberius, 2021). Coworking-spaces are most typically utilized by early-stage entrepreneurs or freelancers that are

working to promote venture growth and establish social and professional relationships, and our research shows that coworking-spaces embody characteristics prototypical of their members. Third, we offer a fresh perspective on the reciprocal relationship between the provider-shaped context (Bouncken & Tiberius, 2021), founder identity, and a sense of community. Our study focuses on the microsocial context of immediate entrepreneurial space and contributes to research concerning the alignment or misalignment of social context and venturing (Foy & Gruber, 2021; Pidduck & Clark, 2021). Finally, we contribute to research on a sense of community, specific to coworking-spaces (Garrett et al., 2017), by offering insight into how this contextualization explains the relationship between new venture growth and founder identity. In this way, we integrate the literature on psychological and sociological theories of identity to offer a more comprehensive picture of the constraining and enabling properties of social context.

4.3 THEORETICAL DEVELOPMENT

4.3.1 Founder Identity

Founder identity, or the concept of self (Fauchart & Gruber, 2011), is developed and defined as “the constellation of claims around the founders, organization, and market opportunity of an entrepreneurial entity that gives meaning to questions of ‘who we are’ and ‘what we do’” (Navis & Glynn, 2011, p. 480). Founder identity is particularly powerful in the earliest stages of the entrepreneurial process (Fauchart & Gruber, 2011). By asking entrepreneurs questions about who they are and who they want to be, scholars can determine whether nascent entrepreneurs are principally motivated by economic self-interest or through a belief that entrepreneurship offers an opportunity to act as a powerful agent of change within society (Fauchart & Gruber, 2011; Gruber & MacMillan, 2017; Sieger, Gruber, Fauchart & Zellweger, 2016). The idea of a founder identity and its embeddedness has overlaps with social and role identity theory. Social identity theory explains how the development of an individual’s identity is based on personal and symbolic interaction with others, because these interactions allow an individual to make social comparisons and categorizations and to learn which social groups they want to be associated with, given the emotional and value significance of group membership (Tajfel, Turner, Austin & Worchel, 1979). Role identity theory captures the notion that individuals inhabit roles that are associated with a set of behavioral expectations held by society but that are internalized by role occupants in different ways (Hoang & Gimeno, 2010). Fauchart and Gruber (2011) argue that focusing

purely on the role identity lens fails to capture the fundamental differences between entrepreneurs who create firms out of economic self-interest and those who start their firms out of concern for others. However, the influences of and on social identity is strongly related to informal interpersonal relationships (for example, Ingram & Roberts, 2000; Krackhardt, 1992).

4.3.2 Immediate entrepreneurial space of coworking-spaces

Coworking-spaces combine workspace with social space, where freelancers, entrepreneurs, or employees of small businesses pursue independent professional activities (Fuzi, 2015; Vidaillet & Bousalham, 2018). Users of coworking-spaces generally pay a monthly fee to share a space with others, with an explicit purpose of social belonging (Bouncken & Reuschl, 2018). Coworking-spaces are different from rental office spaces in that coworking provides a flexible and functional work atmosphere along with membership in a social community (Garrett et al., 2017). The interior physical space, the autonomy in work habits, and the opportunity for both social exchange and learning are known to stimulate creativity and entrepreneurship (Bouncken & Aslam, 2021; Orel, 2019; Waters-Lynch & Duff, 2021). Coworking-spaces specifically offer a unique environment to explore both the embedded entrepreneur and the surrounding social structure, which can be considered an immediate entrepreneurial space. We define immediate entrepreneurial space as the micro, social, and spatial context in which entrepreneurs act, interact, and make sense of the social and physical resources available within the space.

Members of a coworking-space work alongside each other, sharing the workspace and resources, despite not necessarily working for the same organization or on the same project (Bouncken, Aslam & Brem, 2019; Clifton, Fuzi & Loudon, 2019; Cuérel, Loots & Lavanga, 2019; DeGuzman & Tang, 2011; Bouncken & Aslam, 2019). It is important to note that users of a coworking-space do not usually share any collective economic interest (Waters-Lynch & Potts, 2017). However, users of coworking-spaces may form new venture teams or collaborate between venture teams since the context of coworking allows for new relationships to be formed. Participation in educational or social events may also deliver new insights or connections that directly impact venture growth. The social aspects of coworking-spaces give rise to interactions that encourage learning and knowledge exchange, providing an environment ripe for entrepreneurship (Bouncken et al., 2020).

Coworking-spaces are likely to have diverse ownership and governance structures, which may be provided by an organization, an individual firm, a public institution, a university, or a company (Bouncken & Reuschl, 2018). While the culture within a coworking-space is strongly influenced by dynamic interactions among users, providers of the coworking-space also influence their users and the community development by their business model, userselection mechanisms, marketing strategies, and physical artifacts of the space, such as interior design, cafes, or makerspace components and the narratives, which frame both social interactions and recursive legitimacy processes (Bouncken et al., 2020; Bouncken & Tiberius, 2021; Gantert et al., 2022).

4.4 HYPOTHESIS DEVELOPMENT

4.4.1 Innovativeness

The recursive legitimacy model argues that users of coworking-spaces have expectations informed by their own knowledge, by the providers through their narratives, and by the physical interior of the space, all of which results in influenced behaviors within the coworking-space. Research shows that the dynamics of social interactions between coworkers are influenced by objective and symbolic activities, such as verbal expressions or written language (Lounsbury & Glynn, 2001). These channelled expectations and social interactions generate a complex system within coworking-spaces in which multiple stories exist and are being enacted at the same time (Boje, 2008). Storytelling, defined as the combination of narratives and counter-narratives, living stories and counter-stories (Boje, 2008), can be more or less explicitly directed toward coworking-space users who draw on the narratives for the selection of a space and expectations for behaviors. Storytelling in narratives can therefore influence users in different ways, such as establishing values, beliefs, and norms (O'Connor, 1999), forming a social order, or encouraging specific entrepreneurial behaviors (Zilber, 2007). Given the novelty lens of entrepreneurship, we focus on the influence of innovativeness in coworking-space narratives as generated by providers. Accordingly, coworking-space providers can promote innovativeness in narratives (for example, using text and pictures as proof of the value processes).

As defined by Lumpkin and Dess (1996, p. 142), innovativeness is a “firm’s tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes.” Innovativeness is conceptually embodied within organizations by a strong commitment to new product introduction and

leadership (Covin & Slevin, 1991). Providers of shared spaces such as incubators, accelerators, and coworking-spaces can shape an environment of innovativeness through their material offerings and social programs (Aslam, Bouncken & Görmar, 2021; Bouncken et al., 2020) but also through their narratives, which influence the selection processes of users and their behaviors within the space (Gantert et al., 2022). Innovation and community are primarily what makes coworking-spaces so appealing, as collaboration can lead to instances of creativity in the workspace (DeGuzman & Tang, 2011), knowledge exchange and development of entrepreneurial practices (Butcher, 2018), and foster networking practices (Leforestier, 2009) that may support new venture growth.

A significant body of prior research on coworking-spaces implicitly or explicitly shows that coworking contributes to innovation (Bouncken et al., 2020; Bouncken & Qiu, 2022; Bouncken et al., 2019; Kraus et al., 2022; Botsman & Rogers, 2011; Howell, 2022; Gauger, Pfnür & Strych, 2021). It is the diversity of users (Vidaillet & Bousalham, 2018), the autonomy of users (Bouncken et al., 2020), the collaboration between users, and the potential for serendipitous social encounters that all contribute toward an increase in innovation (Heinzel, Georgiades & Engstler, 2021; Görmar, Barwinski, Bouncken & Laudien, 2021; Cabral & Van Winden, 2020). Further, the embeddedness of community (Bednář, Danko & Smékalová, 2021; Spinuzzi et al., 2019) and the collaborative setting facilitates a collaborative climate and open knowledge exchange, which promotes innovation (Lashani & Zacher, 2021; Rese, Görmar & Herbig, 2021). Recently, researchers become interested in how the physical interior design of a space might trigger innovation (Bouncken & Aslam, 2021; Bouncken et al., 2020). Coworking-space providers provide creatively designed interiors (Sarooghi, Sunny, Hornsby & Fernhaber, 2019); creativity is considered a critical aspect of innovation (Amabile, Conti, Coon, Lazenby & Herron, 1996). However, besides facilitating the social climate and a physical environment that supports innovativeness, coworking-space providers similarly construct an external narrative to attract future users to the coworking-space, while also bringing direction to the expectations of behavior in these social spaces. Botsman and Rogers (2011) suggest that social interaction contributes to innovation. We argue that coworking-spaces provide an "engine" for innovation that occurs through the priming of user selection processes, behaviors, and collaborative relationships in a creative environment. As the connection between social interaction, innovation, and coworking-spaces contributes to the perceived productivity of its users (Ferreira, Fernandes & Ferreira, 2019), coworking-space providers can prime their users through innovativeness

within the narrative. The relationship between innovativeness and performance is well-established in the literature (Calantone, Cavusgil & Zhao, 2002; Hult, Hurley & Knight, 2004; Rubera & Kirca, 2012; Wales, Gupta & Mousa, 2011). Taken together, we argue that high levels of innovativeness in the narratives of coworking-spaces are an act of sense-giving of the provider that influences the selection of a space by an entrepreneur and further primes its behavior. Hence, the narrative indicates a context supportive of many factors that positively influence venture growth.

Proposition 1: Higher levels of innovativeness in the narratives of coworking-spaces will be positively associated with venture growth for entrepreneurs embedded within the space.

4.4.2 Founder Social Identity

Fauchart and Gruber (2011) conducted an in-depth exploratory study of 49 recent firm founders to build out a typology detailing the primary types of founder identities and how each can affect new firm creation. They found that research in this domain has expanded from individual- to multi-founder organizations in consideration of the impact of identity processes on organizing efforts in multi-founder nascent ventures, such as how to move forward and remain jointly engaged in their organizing efforts (Glynn & Navis, 2013). This research shows that the Darwinian and Missionary founder identities are dissimilar in behaviors and actions (Fauchart & Gruber, 2011), basic social motivations, criteria of self-evaluations, framing in reference to others (Ko & Kim, 2020), and in entrepreneurial goals (Ko & Kim, 2020). As such, we assume different underlying processes to new venture growth for different founder identities.

4.4.2.1 Darwinian Identity

Entrepreneurs with the Darwinian identity represent the "typical" entrepreneur (Fauchart & Gruber, 2011), oriented toward launching profitable new ventures and seeking to achieve venture performance in the most traditional – financial – sense (Fauchart & Gruber, 2011). Darwinian founders devote most of their attention to activities aimed at promoting firm growth and financial success, view competing firms as the primary external point of reference in their social space, and attempt to achieve competitive advantage by differentiating their firms from the others in the industry (Fauchart & Gruber, 2011). The greater the identification with the Darwinian identity, the stronger the focus on venture performance, in order to create and capture value (Estrada-Cruz, Verdú-Jover, Gómez-Gras

& Martinez, 2019). While social resources, such as access to networking and investors, may be critical for launching a new venture (Maxwell & Lévesque, 2014), financial resources are considered the primary source of competitive advantage for Darwinian founders. Darwinian entrepreneurs view competitors and other entrepreneurs as their frame of reference in regard to the social group against which they evaluate themselves (de la Cruz, Jover & Gras, 2018). These founders are driven by self-interest and see themselves as business professionals (Fauchart & Gruber, 2011) with a tendency to engage in activities that achieve specific results and make decisions based on expected returns. With the increasing popularity of coworking-space-related benefits for entrepreneurial success, being embedded within a coworking-space may be appealing to entrepreneurs who identify with the Darwinian identity, as these founders focus on exploiting opportunities in order to create and capture the value and tend to rely on traditional methods for marketing, resource acquisition, financial stability, and competitive advantage.

Proposition 2a: *Greater identification with the Darwinian identity for entrepreneurs embedded in a coworking-space is positively related to venture growth.*

4.4.2.2 Missionary Identity

Entrepreneurs with the missionary identity primarily view a new venture as a platform from which to pursue their social goals, due to a sense of social responsibility (Fauchart & Gruber, 2011), and often through social entrepreneurship (Ko & Kim, 2020). The locus of their self-definition is the "impersonal we" (Sieger et al., 2016). This type of founder is oriented to launching new ventures to improve social well-being and protect the environment, through which socially responsible attributes become attached to the image of the venture (Lai, Chiu, Yang & Pai, 2010). Entrepreneurs who identify with the missionary identity are motivated by the desire to advance some greater cause, often social or societal in nature, with a fundamental goal to act responsibly. Social behaviors assist a new venture in building a favorable reputation, and those individuals with the missionary identity tend to prioritize activities aimed at improving social well-being (Lai et al., 2010). As coworking-spaces are specifically designed to facilitate social interaction in order to enable knowledge exchange, creativity, and innovation processes (Bouncken et al., 2020), it becomes increasingly likely that entrepreneurs who identify as missionary will succeed within a coworking-space due to intense social contact and collaboration. For example, help- and care-oriented social interactions are likely to motivate these founders. Founders with the missionary identity

generally pursue goals that come from a comprehensive vision of changes, and this is linked with new social practices (for example, modes of consumption or production; Fauchart & Gruber, 2011), and consequently, new venture growth.

Proposition 2b: *Greater identification with the missionary identity for entrepreneurs embedded in a coworking-space is positively related to venture growth.*

4.4.3 Founder Identity and Narratives

As discussed earlier, storytelling is used in organizational narratives in order to strategically position the organization toward a specific audience, such as investors or consumers (Zhao, Fisher, Lounsbury & Miller, 2017; Lounsbury & Glynn, 2001). Coworking-spaces similarly generate narratives to position and market the space to potential members. Storytelling in the provider-generated narrative is likely to influence entrepreneurs in two ways: directly, through their selection processes and through priming of expectations and behavior, and indirectly, through the social system present within the coworking-space. Flexibility, inherent ambiguity, and openness to interpretation of stories makes narratives a suitable vehicle for institutional entrepreneurship (Zilber, 2007). As venture growth can be influenced by the alignment of the founder identity with the social context (Foy & Gruber, 2021), founder identities are accompanied by different perceptual abilities or responsiveness to social or competitive content in environmental narratives. When coworking-space providers present high levels of innovativeness in their narratives, those entrepreneurs that identify with the Darwinian identity may be more receptive to narratives that signal potential for venture growth and consequently self-select into the coworking-space. For those individuals that identify with missionary identity, which refers to “society as a whole as the relevant reference in the social space” (Fauchart & Gruber, 2011, p. 941), it is more likely that these entrepreneurs will be less responsive to narratives of innovativeness as generated by coworking-space providers, because identification with overall social goals as a whole and with their own identity potentially reduces the importance of the provider’s narrative.

Proposition 3: *The Darwinian identity will have a great positive moderating effect on the positive relationship between innovativeness and new venture growth than the missionary identity.*

4.4.4 Sense of Community

Within organizations, a sense of community has been found to impact broader organizational outcomes, such as employee engagement, empowerment, turn over, and job satisfaction (Boyd & Nowell, 2014; Burroughs & Eby, 1998). Coworking-spaces have the potential to encourage a sense of community, which is co-constructed by independent users through three types of collective actions: endorsing, encountering, and engaging (Garrett et al., 2017). The sense of community emerges within the specific environment of the space, which includes the interior of the coworking-space, the physical location, the rules set by the provider, and the social interactions between the users of the coworking-space (Bouncken et al., 2020). A sense of community relates to values of “belongingness” and prosocial values, which have been shown to be strong anchors for identity (Conger, McMullen, Bergman Jr & York, 2018). In coworking-spaces, individuals develop a sense of community through these feelings of prosocial belonging, which explains the positive relationship between the missionary identity (for example, prosocial focus) and new venture growth. Accordingly, we assume that sense of community operates as a mediating mechanism in coworking-spaces, as social relationships are necessary for the development of innovation and the growth of new ventures. Through the missionary identity, which is focused on society as a whole, we assume that the sense of community facilitates the relationships between founder identity and venture growth due to the prosocial values associated with a sense of community.

Proposition 4a: *Sense of community mediates the positive relationship between the missionary identity and venture growth.*

The Darwinian identity is more focused on competition in the social space (Fauchart & Gruber, 2011) and more likely to be receptive and responsive to innovativeness in coworking-space narratives. This competitive response contributes to the development and ongoing maintenance of a sense of community within the coworking-space (Howell, 2022). Building on this logic, we argue that a sense of community acts as a mechanism between founder identity, high levels of innovativeness in the provider-generated narrative, and venture progress, due to the networking, knowledge and resource exchange, and creativity associated with a sense of community and related to venture performance.

Proposition 4b: *Sense of community mediates the interaction between the Darwinian identity, high levels of innovativeness in the provider-generated narrative, and venture growth.*

The full theoretical model and accompanying hypotheses are presented in Figure 5.

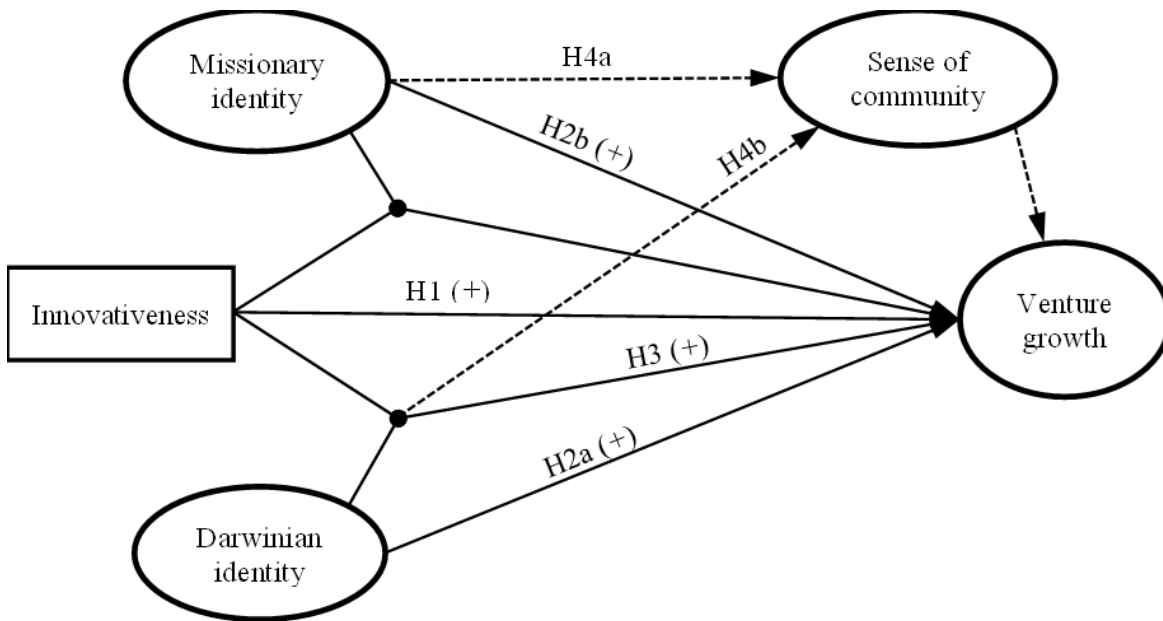


Figure 5: Conceptual Model

4.5 METHODOLOGY

4.5.1 Sample

To examine our research questions, we integrated data from two sources. First, a total of 118 coworking-spaces, distributed across Germany, China, the United States, Austria, and Norway were selected for this study using the criteria that each coworking-space must be a public coworking-space, open to any interested users (Bouncken, 2018). We gathered data at the level of the individual users and providers, and at the level of the coworking-space. Survey questionnaires were available in three ways: a paper questionnaire to be filled out by hand, an Android application on tablets provided by the study, or through a web link. Usable responses were eventually received from 317 entrepreneurs across 57 coworking-spaces. Within the sample, the average age of the coworking-space user is 26.1 (SD = 5.8), with an average of 4.1 (SD = 4.0) years of work experience. Per month, the surveyed users work an average of 19.9 days in a coworking-space. Across 57 coworking-spaces, the average age of the space is 3.6 years, with an average of 283 users per month and a utilization rate of 79.9%. On average, 32.8% of the space offered in the surveyed coworking-spaces is open shared (community) office space, while 34.9% is available as individual office space. Complete demographic information is available in Table 7.

User sample (N = 317)	Mean	SD
Age in years	26.1	5.8
Work experience since school/university	4.1	4.0
Number of days per month worked in coworking-space	19.9	14.0
Number of differently used CWS	2.0	1.6
Average time spent in a shared office (in %)	46.8	34.3
Average time in a single office (in %)	39.1	30.9
Provider sample (N = 57)		
Age in years	3.6	0.5
User per month	283.0	201.3
Utilization rate	79.9	11.8
Average percentage of shared offices (in %)	32.8	20.6
Average percentage of single office (in %)	34.9	26.3

Table 7: Sample Demographics

In addition to survey-based data, we measured the degree of innovativeness in the narratives of coworking-spaces through computer-aided text analysis (CATA), collected at the level of the coworking-space. CATA enables the measurement of specific constructs by processing text into quantitative data based on the frequency of words within the text (McKenny, Anguinis, Short & Anglin, 2018). CATA measures are purported to possess near-perfect reliability because of the removal of human error in coding (Short & Palmer, 2007; Short, Payne, Brigham, Lumpkin & Broberg, 2009). Accordingly, we gathered data from the website of each coworking-space from which we collected the survey data.

4.5.2 Measures

Venture Growth: Our dependent variable, venture growth, in this study captures the growth of new ventures for entrepreneurs embedded within coworking-spaces. For the purposes of our study, we ask specific questions related to customer search and acquisition, developing a new venture team, and self-perception of venture growth by the founders, measures similar to those used to capture small business growth (Wiklund & Shepherd, 2005) and shown to correlate strongly with new venture performance (Baum, Bird & Singh, 2011). In our study, venture growth was measured using three items, each measured on a 5-point Likert scale. All constructs and items are available in Table 8.

	Items	FL	α	AVE	FL-R	HTMT-R
Darwinian Identity	D1. <i>I work to make money and become rich.</i>	0.691				
	D2. <i>I work to advance my career in the business world.</i>	0.829				
	D3. <i>It is very important to me to outperform others in my domain and to establish a strong competitive advantage.</i>	0.742	0.792	0.566	0.372	0.262
Missionary Identity	M1. <i>I work to play a proactive role in changing how the world operates.</i>	0.798				
	M2. <i>To me, it is very important to make the world a better place.</i>	0.856	0.856	0.666	0.317	0.392
	M3. <i>It is very important to me to have a strong focus on what I am able to achieve for society-at-large.</i>	0.801				
Sense of Community	S1. <i>Working here (workspace) allows me to become part of a community.</i>	0.721				
	S2. <i>Working here (workspace) allows me to overcome social isolation.</i>	0.685				
	S3. <i>Working here (workspace) allows me to contribute to the needs of others.</i>	0.732	0.753	0.506	0.467	0.376
	S4. <i>Working here (workspace) allows me to build new friendships.</i>	0.738				
Venture Growth	V1. <i>The development of the venture has dramatically improved since entering here.</i>	0.788				
	V2. <i>The development of the venture has dramatically grown in terms of members since entering here.</i>	0.726	0.819	0.601	0.395	0.359
	V3. <i>The development of the venture has dramatically grown in terms of clients since entering here.</i>	0.816				

$N = 317$. Overall-Fit: $\chi^2(df)=127.153 (59)$; CFI=0.953; RMSEA=0.060; SRMR=0.047 Columns show standardized factor loadings (FL), factor reliability (α), average variance extracted (AVE), Fornell-Larcker-ratio (FL-R), and Hetero-Trait-Mono-Trait-ratio (HTMT-R).

Table 8: Confirmatory Factor Analysis

Innovativeness: Our independent variable, innovativeness in narratives of coworking-space providers, was measured through computer-aided text analysis. Coworking-space websites were analyzed for content and parsed based on the frequency of specific words. We used the “CAT scanner” software (McKenny & Short, 2012) and the word lists developed and validated by McKenny et al. (2018) for innovativeness. Despite adjusting the scale per 1,000 words, it yielded a skewed distribution. Therefore, we applied the natural logarithm to the text-based measure.

Sense of Community: The construct of sense of community was measured using a three-item, 5-point Likert scale and is based on the scale developed by Garrett et al. (2017) and refined by Bouncken et al. (2020). A sense of community refers to interrelated collective actions which emerge in a shared vision of community and users' perception of participation in the community, the opportunity to overcome social isolation, and developing friendships with other members as suggested and measured (Garrett et al., 2017).

Identity: To measure founder identity, we aggregated six items, all measured on 5-point Likert scales, with statements that refer to basic social and economic motivations, the basis for self-evaluation, and the frame of reference (Sieger et al., 2016) in order to identify the identity type of the founder: Darwinian or missionary. Finally, the measures originate from different sources to circumvent common method bias implicit to single-source data (Podsakoff, MacKenzie & Podsakoff, 2012).

4.5.3 Analysis

We used confirmatory factor analysis (CFA) to test the measurement model for the four latent variables. The purpose of CFA is to specify the causal relations of constructs to one another, with the constructs allowed to intercorrelate freely (Anderson & Gerbing, 1988). The significant chi-squared value indicates a restricted but reasonable approximation ($\chi^2/df = 2.155$). The following cutoff criteria were used for the alternative fit indices: comparative fit index (CFI) > 0.95 (Hu & Bentler, 1999), root mean squared error of approximation (RMSEA) < 0.05 (Browne & Cudeck, 1992), and standardized root mean squared residual (SRMR) < 0.08 (Hu & Bentler, 1999). Considering the limited sample size, the overall fit supports the appropriateness of the measurement model. Table 8 shows the results of the confirmatory factor analysis with a robust maximum-likelihood estimator (MLR) and indicates that all constructs were suitably measured. To verify the internal consistency (convergent validity) of the latent variables, we expect standardized λ of the construct-relevant indicators to be ≥ 0.60 (Bogazzi & Yi, 1988). For all latent variables, the composite reliability is ≥ 0.70 . (Bacon, Sauer & Young, 1995).

Furthermore, for all latent variables the average variance extracted (AVE) is ≥ 0.5 . (Hair, Black, Babin, Anderson & Tatham, 2010), which supports an insignificant amount of measurement error (Fornell & Larcker, 1981). We used several techniques to assess the discriminant validity of the constructs. First, we used the ratio of latent variable variance in its associated indicator variables and that which it shares with other constructs in the model.

The Fornell–Larcker ratio is appropriate, at less than 1.00 (Fornell & Larcker, 1981) for all constructs. Furthermore, we assess the ratio of heterotrait correlations (HT) by the average correlation between the indicators across constructs, measuring different phenomena, with the monotrait correlations (MT) by the average correlation between the indicators of the same construct. With HTMT-ratios less than 0.39, no lack of discriminant validity is indicated (Henseler, Ringle & Sarstedt, 2015). In addition, we perform five bootstrap replications to determine the 95% confidence intervals (CI) of correlations between latent variables (CICFA; Rönkkö & Cho, 2020). The results range between 0.07 and 0.39, which is appropriate (Rönkkö & Cho, 2020) and indicates discriminant validity (Anderson & Gerbing, 1988). To limit inflation of the model fit values associated with the limited number of cases, we constrained the factor loadings in the following analyses to the values of the CFA.

In consideration of the specific challenges and requirements of our hypothesis testing and to account for the nested structure of users within coworking-spaces, which implies non-independence of respondents, we selected multilevel structural equation modeling (SEM) to test our hypothesized relationships (Rabe-Hesketh, Skrondal & Pickles, 2004; Raudenbush & Bryk, 2002). This technique considers the shared variance in hierarchically structured data so that the slopes at a lower level (for example, user-level) and their implementation in estimating higher-level outcomes (for example, coworking-space-level) are estimated. This simultaneously examines relationships within and between hierarchical levels of grouped data, which makes this technique more efficient than other existing approaches (Hofmann, 1997). Because observational data do not provide information about causal inference,

endogeneity is a potential area of concern (Ketokivi & McIntosh, 2017). To deal with measurement error (Antonakis, Bendahan, Jacquart & Lalive, 2014), we used a reflective multiple-indicator-measurement approach. SEM explicitly recognizes that the latent constructs of interest could be measured with error (Mai, Niemand & Kraus, 2021). As such, the manifest indicators are linked with a true value of their respective latent variables and with a disturbance term that includes all other influences. This allows for the assumption that the different means of disturbance terms are uncorrelated with each other or with the latent exogenous variables (Bollen & Pearl, 2013).

To test for omitted variables, we added several control variables to our model. First, we controlled for the user's work experience, measured in years, as work experience can

influence the behavior of members within organizations, such as users in coworking-spaces (Podsakoff et al., 2000). Specific to entrepreneurship, user experience can predict venture performance when occurring in combination with education (Iversen, Malchow-Møller & Sørensen, 2016) or age (Stam & Elfring, 2008; Zahra & Garvis, 2000); thus, we chose to control for the user's age as well. We controlled for the intensity of coworking-space usage, measured by coworking-space usage in days per month, and user's coworking-space experience, measured by the number of different coworking-spaces used in the last year, as these can influence user perceptions and behaviors through familiarity with the coworking-space context (Gulati, 1995; Kale, Dyer & Singh, 2002; Mora-Valentin, Montoro-Sanchez & Guerras-Martin, 2004). Finally, we controlled for user time spent in shared offices or single offices, as these can indicate a user's need for boundaries or community.

If the data contains substantive common method variance, correlated disturbances can arise from a cross-sectional design. Common method variance (CMV) endangers the validity of findings (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). To avoid misspecification of the model, we controlled for method variance (Spector, 2019), using the confirmatory factor analysis marker technique (Williams, Hartman & Cavazotte, 2010) designed for detecting common method variance in data (Richardson, Simmering & Sturman, 2009). We use polyphony as a latent marker variable, measured by using a three-item, 5-point Likert scale. The items of the scale include the diversity of functional and industrial backgrounds and the different management levels of the coworking-space users.

In the first phase of the CMV analysis, we compared models with fixed specific parameters (Williams et al., 2010) that detect method variance in the data (Table 10 in Appendix). The results show statistically significant method factor loadings on the latent variable indicators of interest, implying that the indicators are contaminated by a source of method variance captured by the marker variable (Table 11 in Appendix). These factor loadings ranged from $\lambda = 0.15$ to 0.18, which means that the proportion of marker variance in the indicators of the latent variables of interest ranged from 2.25 to 3.24%. In the second stage of the CMV analysis, we used reliability decomposition to quantify the proportion of method variance associated with the measurement of the latent variables of interest. Expressed as a percentage of the total reliabilities, these method components account for 2.23 to 5.35% of the reliability values for the latent variables of interest (Table 12 in Appendix). In the third phase of the CMV analysis, we determined the sensitivity of the results, increasing the amounts of

variance in the marker method associated with sampling errors in the measurement of the marker variables. As shown in Table 13 (Appendix), the correlations between the latent variables of interest remained significant and relatively unchanged when the magnitude of the method factor loadings was increased to values associated with both the higher end of the confidence interval of $\alpha = .05$ in the Method-S (.05) model and based on the confidence interval $\alpha = .01$ in the Method-S (.01) model. In summary, some method variance is detected in the data, but it does not have a strong influence on the reliabilities of the latent variables of interest or their correlations.

In regard to Fauchart and Gruber's (2011) suggestion that founders could be classified as pure or hybrid, we analyzed the covariance between the two identities, and we tested these paths of the model with instrumental variables in a latent variable framework (Table 14, available in Appendix). The tested path coefficients show similar results, and when simultaneously estimated, covariances between the disturbance terms are insignificant (Table 14, available in Appendix). Consequently, the results are robust.

4.5.4 Results

Testing began with control variables and the dependent variable, venture growth, then successively added the independent variables of interest. Model 1 in Table 9 shows that the control variables of years of work experience ($\gamma = 0.503$; $z = 3.840$; $p = .000$) and user age ($\gamma = -0.507$; $z = 4.031$; $p = .000$) predict venture growth. These effects remain robust throughout all tested models. In Model 2 we added innovativeness, postulated to have a positive influence on venture growth. We find support for proposition 1, such that increasing levels of innovativeness in the provider-generated narrative are positively related to venture growth of entrepreneurs embedded within the space ($\gamma = 0.187$; $z = 2.391$; $p = .017$). Model 3 added the founder identity variables (proposition 2a and 2b). We do not find support for proposition 2a ($\gamma = -0.070$; $z = -0.833$; $p = .405$); the Darwinian identity is not positively related to venture growth. However, we find support for proposition 2b ($\gamma = 0.341$; $z = 4.321$; $p = .000$), such that the missionary identity is positively related to venture growth. Model 4 addresses the interaction between founder identity and the level of innovativeness in the narratives of coworking-spaces (proposition 3). In consideration of identity as a moderator, we find that the interaction between the Darwinian identity and innovativeness positively relates to venture growth ($\gamma = 0.125$; $z = 3.977$; $p = .000$). Using the following equation, we

extract the marginal effect of the Darwinian identity on venture growth at low vs high levels of innovativeness:

$$\frac{\partial_{Venture\ progress}}{\partial_{Darwinian\ ident.}} = \gamma_1 + \gamma_3 innovativeness$$

The results show a significant positive effect of Darwinian identity on venture growth ($\gamma = 0.190$; $z = 3.811$; $p = .000$) at high levels of innovativeness and a significant negative effect at low levels of innovativeness. Figure 6 illustrates these interaction effects.

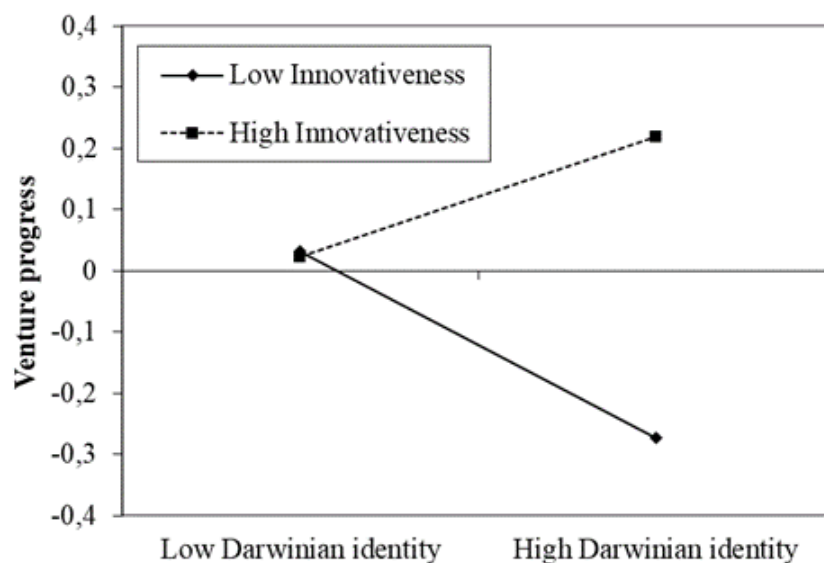


Figure 6: Interaction between Darwinian identity and Innovativeness

However, for the interaction between missionary identity and innovativeness, we find an insignificant coefficient on venture growth ($\gamma = -0.018$; $z = -0.339$; $p = .694$). We interpret this to understand that there is neither a positive nor a negative (suppressor) moderation effect of the missionary identity on the relationship between innovativeness and venture progress. In summary, we find support for proposition 3.

Model 5 adds the potential mediator, a sense of community, to test propositions 4a and 4b. We find that the missionary identity increases a sense of community significantly ($\gamma = 0.437$; $z = 4.989$; $p = .000$) and that a sense of community increases venture growth ($\gamma = 0.394$; $z = 5.418$; $p = .000$). The indirect effect of missionary identity on venture growth via a sense of community ($\beta = 0.173$; $z = 3.676$; $p = .000$) supports proposition 4a, such that a sense of

community mediates the positive relationship between the missionary identity and venture growth. At a significance level of $p < .10$, we find support for proposition 4b ($\beta = 0.062$; $z = 1.902$; $p = .057$), which states that the interaction of Darwinian identity with innovativeness in the narratives leads via a sense of community to venture growth. Results from all models are shown in Table 9.

4.6 DISCUSSION

The purpose of this study was to examine the contextual factors of a coworking-space. Specifically, how the provider-generated narratives and a sense of community interrelate with the identities of entrepreneurs working in the space and how those relationships relate to venture growth.

First, we find that coworking-spaces with higher levels of innovativeness in their narratives positively relate to venture growth for entrepreneurs embedded in the space (proposition 1). Innovativeness has been repeatedly cited as a driver of new venture performance (Mathias, McCann & Whitman, 2021; Shepherd & Patzelt, 2017) and new venture growth (Burgelman, 1984; Gimenez- Fernandez, Sandulli & Bogers, 2020). The emergence and rapid growth of coworking-spaces can also be traced to a desire to facilitate the creation and support of innovative environments. Our study is the first to examine new venture performance for entrepreneurs embedded within coworking-spaces and robustly demonstrates that innovativeness in the narratives offered by providers of coworking-spaces does in fact positively relate to venture growth.

DV/ Mediator	Model 1		Model 2		Model 3		Model 4		Model 5	
	γ	(z-value) P	γ	(z-value) P	γ	(z-value) P	γ	(z-value) P	γ	(z-value) P
User's work experience	0.547	(4.356) ***	0.503	(3.840) ***	0.443	(3.347) ***	0.433	(3.244) ***	0.432	(3.320) ***
User's age	-0.603	(-5.146) ***	-0.507	(-4.032) ***	-0.456	(-3.357) ***	-0.439	(-3.178) ***	-0.406	(-3.198) ***
Intensity of CWS-use	0.042	(0.803)	0.047	(0.922)	0.059	(1.635)	0.044	(1.200)	0.017	(0.466)
User's CWS-experience	0.011	(0.188)	0.002	(0.029)	-0.016	(-0.294)	-0.011	(-0.217)	-0.027	(-0.752)
User's time in shared office space	-0.086	(-1.239)	-0.051	(-0.715)	-0.020	(-0.322)	-0.010	(-0.148)	-0.003	(-0.049)
User's time in single office space	-0.214	(-3.077) **	-0.156	(-2.046) *	-0.136	(-2.040) *	-0.116	(-1.564)	-0.091	(-1.262)
Innovativeness (H1)			0.187	(2.391) *	0.135	(2.505) *	0.121	(2.024) *	-0.029	(-0.260)
Darwinian identity (DI) (H2a)					-0.070	(-0.833)	-0.027	(-0.334)	-0.055	(-0.540)
Missionary identity (MI) (H2b)					0.341	(4.321) ***	0.318	(3.999) ***	0.437	(4.989) ***
DI x Innovativeness (H3)							0.125	(3.977) ***	0.159	(2.124) *
MI x Innovativeness (H3)							-0.018	(-0.339)	-0.004	(-0.038)
Sense of community (H4a, H4b)									0.065	(1.793) †
									-0.001	(-0.013)
									0.394	(5.418) ***

Estimated path coefficients are significant with p-values <0.10[†], <0.05, <0.01**, and <0.001****

Table 9: Structural Equation Modeling Results

Second, our findings suggest that coworking-space providers can promote new venture growth in coworking-space by prompting and priming behaviors. Our research demonstrates that there is congruence between the provider-generated narrative and self-selection into the space. Further, we suggest that this congruence, as well as related expectations and behaviors of the entrepreneurs (users), is essential for attraction, retention, and performance of users in a coworking-space. Extending this logic, we predict that the maintenance of this fit between entrepreneur and coworking-space environment will continue to positively relate to new venture growth and performance if the coworking-space is indeed offering a work environment that remains congruent with the perception of the entrepreneur embedded within (Kristof, 1996; Sherman, Nave & Funder, 2012).

Third, we find no direct support for the relationship between the Darwinian identity and venture growth (proposition 2a), but strong statistical support for a positive relationship between the missionary identity and venture growth (proposition 2b). The latter finding offers insight into the alignment or misalignment between founder identity and social context (Foy & Gruber, 2021). The social copresence, interactions, and recursive processes in coworking-spaces (Bouncken & Tiberius, 2021) allow the individual to make social comparisons and categorizations (Tajfel et al., 1979). We consider that entrepreneurs who identify with the missionary identity are more likely to experience venture growth, due to the social nature of coworking-spaces and far more than those entrepreneurs that identify with the Darwinian identity, who place a higher priority on financial performance. Considering that coworking-spaces support a high level of social interaction, it is likely that individuals seeking a prosocial context would be attracted to a coworking-space. As such, our findings support that those individuals identifying with the missionary identity are more likely to be attracted to, and find success within, the prosocial elements of coworking-spaces.

We did not find statistical support for any relationship between the Darwinian identity and venture growth until we considered innovativeness as a potential moderator. Innovativeness may "prime" individuals who enter into the context of immediate entrepreneurial space, which can occur in social, political, or economic dimensions (Foy & Gruber, 2021). It seems that entrepreneurs that identify with the Darwinian identity are more likely to drive venture growth when they perceive a match between the provider-generated narrative and their economic interests, values, and venture goals. High levels of innovativeness in the narrative strengthened a positive relationship, and low levels of innovativeness in narratives

strengthened a negative relationship between the Darwinian identity and venture growth (proposition 3). We submit that the strong alignment and misalignment effects may be due to the "priming" effect of the environment, which strengthens relationships between identity related motivations and venture growth. Through their perception of a coworking-space entrepreneurs who identify with the Darwinian identity may be more receptive to knowledge exchange and participation in the environment, and subsequently enjoy new-venture-related economic advantage, in regard to new venture growth. In contrast, the priming effects of innovativeness in narratives do not interact with the missionary identity; this may be due to the heightened importance of meeting social needs, more likely to be driven by social exchange and the community. As such, we submit an extension of founder identity theory that considers the alignment or misalignment between identity and the immediate entrepreneurial space as an element that supports or encumbers new venture growth.

A sense of community plays an important role in coworking-space dynamics (Bouncken et al., 2020), particularly for founders, for whom it is important to leverage social interactions as part of ongoing venture growth. Entrepreneurs with the missionary identity will relate differently to a sense of community than those with the Darwinian identity. Specifically, we find that the Darwinian identity depends on the interaction between a high level of innovativeness in the provider-generated narrative and a sense of community to predict venture growth (proposition 4b). For those entrepreneurs that identify with the missionary identity, we find that venture growth is partially transmitted through the mechanism of a sense of community (proposition 4a). The contextual setting of the provider-generated narrative is not necessarily required to promote venture growth for these entrepreneurs but may be dependent on prosocial processes within the space. For those entrepreneurs that identify with the Darwinian identity, we find that high levels of innovativeness as expressed through context are of critical importance to new venture growth. Our results suggest that context plays a critical role, which aligns with sociological theories of identity, which traditionally direct attention to context, as identity is defined by the interactions that take place within a specific social structure (Stryker, 1980).

Our study contributes to research that explores the alignment of founder identity with context (Fox, Simsek & Heavey, 2021). Through the provider-generated narratives, coworking-spaces can create an environment that allows for both the knowledge transfer and social support needed to promote venture growth. Indeed, narratives are important for

entrepreneurial success (Zhao et al., 2017; Glynn, 2019; Glynn & Navis, 2013; Navis & Glynn, 2011; Wry, Lounsbury & Glynn, 2011). When ventures are in their early stages (Harms & Schwery, 2020), they exist as little more than an idea or a claim of what an entrepreneur might do or what their venture could become, often told in identity stories (Wry et al., 2011).

Taken together, our findings suggest a necessary integration of psychological and sociological theories of identity, in which we do not focus on either the individual or the context but rather examine the complete picture of person-environment dynamics by considering the simultaneous influence of both. By investigating the constraining and the enabling factors of social context, along with how context acts as a barrier to and/or a facilitator of interaction, we are better able to understand the multitude of factors that relate the new venture growth and performance, such as how founder identity interacts with context.

4.7 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The limitations for our study strongly relate to the provider-generated narrative and the measurement of venture growth. First, the provider-generated narrative was collected via CATA of publicly available websites and content, but the survey questionnaire did not question users on their perceptions of the environment of the coworking-space. In accordance with person-environment fit theory, other factors may be at work in attracting entrepreneurs to specific coworking-spaces, and future research may wish to consider isolating and testing other mechanisms at work in this light. As website information might not offer a complete picture of the desired narrative, we instead suggest that future research consider a more detailed measure of narrative that examines a broader set of materials on behalf of the provider that takes into consideration whether the narrative is reflective of the provider perceptions or innovativeness as a construct. Second, we focus on two "pure types" of identities. In a more practical view, identity types are less dualistic than more hybrid forms. Furthermore, Fauchart and Gruber (2011) describe a third type of identity – the communitarians, which is out of our research focus but may add to knowledge accumulation in future research.

Similarly, scholars have made it clear that venture growth is a multidimensional construct that is difficult to conceptualize and measure as no single indicator can adequately capture the essence of the construct (e.g., Venkatraman & Ramanujam, 1986). Self-reporting

performance measures in survey data are found to have high external validity (Chandler & Hanks, 1993). However, other measures to assess venture performance primarily include financial measures (e.g., profit, sales revenue, return on investments or assets) or managerial measures (e.g., firm size, productivity, or firm survival; Zhao, Seibert & Lumpkin, 2010). Finally, while our study highlights the interplay between individuals and context on venture growth, the development and performance of new ventures for entrepreneurs embedded in coworking-spaces are likely to be influenced by a complex web of other influences, such as digitalization, lean startup, design thinking, and other individual-level traits such as passion and persistence (Ferreira et al., 2019; Harms & Schwery, 2020; Kiani, Ali, Biraglia & Wang, 2021; Pidduck & Clark, 2021; Sarooghi et al., 2019). Future scholars may wish to also consider these motives and measures when exploring similar research questions.

4.8 CONCLUSION

Across 317 entrepreneurs embedded within 57 coworking-spaces, we theorize and test relationships between the provider-generated narrative, the social identity of the entrepreneurs embedded in the space, the sense of community as a mechanism of social exchange, and the growth of new ventures for functioning within the space. We leverage identity and person-environment fit theories to explore the connections, collaboration, and socialization that occur within a coworking-space to better understand the factors that relate to venture growth, particularly the alignment or misalignment between founder identity and immediate entrepreneurial space.

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4.10 APPENDIX

Model	χ^2	(df)	Scaling corr.	CFI
Initial	173.567	(94)	1.221	0.954
Baseline	187.632	(103)	1.263	0.951
Method-C	170.503	(102)	1.258	0.960
Method-U	155.715	(90)	1.206	0.962
Δ Models	$\Delta\chi^2$	(df)	p-value	
Baseline- vs. Method-C ^{a)}	6.097	(1)	0.013	
Method-C vs. Method-U ^{b)}	13.007	(12)	0.369	

^{a)} This test “the null hypothesis that the method factor loadings (assumed to be equal) associated with the marker variable were not related to each of the [...] substantive indicators” (Williams et al., 2010: 500) and so that p-values <0.05 indicates support for the presence of method variance.

^{b)} This test “the null hypothesis that the method factor loadings are equal” (Williams et al., 2010: 501) and so that p-values <0.05 indicates support for the presence of unrestricted versus equal method variance.

Table 10: Model Comparison Tests

Items	Darwinian Identity	Missionary Identity	Sense of Community	Venture Progress	Latent Marker
D1.	0.668***				0.157***
D2.	0.822***				0.168***
D3.	0.714***				0.160***
M1.		0.784***			0.149***
M2.		0.839***			0.175***
M3.		0.788***			0.170***
S1.			0.710***		0.167***
S2.			0.678***		0.147***
S3.			0.709***		0.171***
S4.			0.723***		0.172***
V1.				0.769***	0.163***
V2.				0.704***	0.148***
V3.				0.799***	0.159***
Mark1.					0.780 ^{a)}
Mark2.					0.849 ^{a)}
Mark3					0.730 ^{a)}

N = 317. Overall-Fit: $\chi^2(df)=155.715$ (90); CFI=0.962; RMSEA=0.048; SRMR=0.041

Factor loadings are significant with p-values <0.05*, <0.01**, and <0.001***

^{a)} The factor loadings are constrained to the values of the initial model.

Table 11: Method-U-Model Factor loadings: Completely Standardized Solution

		Decomposed Reliability Method-U Model		
Latent Variable	Total Reliability	Substantive Reliability	Method Reliability	% Reliability Marker Variable
Darwinian identity	0.896	0.848	0.048	5.353
Missionary identity	0.891	0.860	0.031	3.490
Sense of community	0.898	0.878	0.020	2.223
Venture progress	0.821	0.802	0.018	2.231

Table 12: Reliability Decomposition

Factor correlations	CFA Model	Baseline Model	Method-U Model	Method-S (0.05) Model	Method-S (0.01) Model
Darwinian identity – Missionary identity	0.467**	0.462***	0.430**	0.436**	0.444**
Darwinian identity – Sense of community	0.103	0.101	0.063	0.078	0.093
Darwinian identity – Venture progress	0.176	0.172	0.112	0.117	0.125
Missionary identity – Sense of community	0.437***	0.437***	0.421***	0.427***	0.434***
Missionary identity – Venture progress	0.386***	0.386***	0.361***	0.363***	0.368***
Sense of community – Venture progress	0.481***	0.481***	0.460***	0.462***	0.467***
Darwinian identity – Marker variable	0.226*	0.000	0.000	0.000	0.000
Missionary identity – Marker variable	0.158*	0.000	0.000	0.000	0.000
Sense of community – Marker variable	0.162	0.000	0.000	0.000	0.000
Venture progress – Marker variable	0.267***	0.000	0.000	0.000	0.000

Correlations are significant with p -values $<0.05^*$, $<0.01^{**}$, and $<0.001^{***}$

Table 13: Baseline and Method-U Factor correlations with method variance

	MLR-Estimation			2SLS Estimation ^{a)}		
	Venture progress			Venture progress		
	γ	(z-value)	<i>p</i>	γ	(z-value)	<i>p</i>
Users work experience	0.094	(2.513)	**	-0.150	(-0.930)	
Users age	-0.072	(-0.844)	**	0.111	(0.734)	
Intensity of CWS-use	0.004	(3.659)	†	0.000	(0.063)	
Users CWS-experience	-0.009	(3.140)		-0.046	(-2.044)	*
Users time in shared office space	-0.001	(-3.130)		0.001	(0.531)	
Users time in single office space	-0.004	(1.673)	*	-0.002	(-0.740)	
Innovativeness ^{b)}	0.161	(-0.293)	*	0.216	(2.829)	**
Darwinian identity ^{c)}	-0.076	(-0.321)		-2.559	(-1.283)	
Missionary identity ^{d)}	0.306	(-2.028)	***	3.752	(1.976)	*

^{a)} The SEM includes the simultaneous estimation of the structural path of the independent latent variables on venture progress and covariance between their disturbance terms. All covariances show insignificant *p*-values.

^{b)} Instruments are three CATA scales that evaluate: Futurity (Brigham, Lumpkin, Payne, & Zachary, 2014), Economic value orientation (inverse coded), and Social value orientation (Moss, Renko, Block, & Meyskens, 2018).

^{c)} Instruments are four items which evaluate: the reputation in the primary organization (inverse coded), the nature of work as a part of a larger project that also involves the work of others outside the space, the individual evaluation that the conditions of the work are excellent, and the nature of work as a part of a larger project that is not wholly pursued within the space.

^{d)} Instruments are four items which evaluate: the individual evaluation that the conditions of the work are excellent, the nature of work as a part of a larger project that is not wholly pursued within the space, the work experience of the user in months, and the age of the user in years.

Table 14: Comparison with 2SLS-estimation

5 THE MORAL FOUNDATIONS OF MAKERSPACES AS UNCONVENTIONAL SOURCES OF INNOVATION: A STUDY OF NARRATIVES AND PERFORMANCE

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5.1 ABSTRACT

Makerspaces provide individuals and communities with physical access to costly technologies and empower them to create material things in a physical space. This new form of citizen engagement has the potential to improve autonomy, creativity, and motivation. Consequently, makerspaces can help firms maintain the innovativeness of their employees. Despite the growing popularity of makerspaces, their moral foundations are still far from clear. Our study’s purpose is to illuminate the moral foundations of makerspaces from a design perspective, combining previously unconnected (1) technical, (2) social, and (3) cognitive levels of makerspaces. This study reveals configurations of high and low user innovativeness and demonstrates the role of moral foundations in makerspaces. Most importantly, technical facilities can compensate for the lack of moral foundations in small and inexperienced user teams. We discuss our findings and highlight the moral foundations of makerspaces as unconventional sources of innovation.

Keywords: Moral foundations; Corporate social responsibility; Makerspaces; Sociomateriality; Innovation; FsQCA; NCA.

5.2 INTRODUCTION

In recent years, coworking-spaces and makerspaces have notably gained research attention (Bouncken & Reuschl, 2018; Halbinger, 2020). Primarily, they provide office, social, and manufacturing spaces for various users who often work alongside each other or interact and socialize (Gandini, 2015). The rise of makerspaces coincides with a greater demand for manufacturing space and access to digital and costly manufacturing technologies (Farritor, 2017; Browder, Aldrich, & Bradley, 2019). Scholars and practitioners alike consider

innovation in makerspaces a new form of citizen engagement, empowering individuals in an increasingly dynamic environment characterized by high uncertainty and low outcome predictability (Halbinger, 2018). Future studies indicate that the phenomenon of makerspaces will continue to gain relevance due to the demand for flexibility and the location independence of work (Akhavan, 2021). To date, the research on makerspaces remains fragmented, and there are no empirical studies that fully explore this relatively new phenomenon. Insights from previous research on coworking-spaces show that working in shared open workspaces, which include makerspaces, is subject to various driving forces. For example, a sense of community, permeability, or sociomateriality help individuals improve their self-efficacy, work satisfaction, entrepreneurship, and innovation performance (Bouncken, Ratzmann, Barwinski, & Kraus, 2020; Schiavone, Tutore, & Cucari, 2020; Bouncken, Aslam, & Qiu, 2021; Lashani & Zacher, 2021). In pursuit of innovation, moral intuitions are necessary for determining the stakeholder values required to design responsible technologies (Umbrello, 2018). Considering the still young and underexplored phenomenon of makerspaces, their moral foundations may provide unconventional emergent sources of future innovation. Addressing this literature and research gap, we set up and examine a holistic model for exploring the different innovation forces in makerspaces. In a nutshell, makerspaces are genuine places of creativity and collaboration. Despite its innovation potential, the moral foundations of makerspaces are still a black box that this study attempts to address. Since environmental and responsible action is becoming the priority, moral foundations and intuitions play an instrumental role in various human behaviors and decision-making processes (Luttrell, Philipp-Muller, & Petty, 2019). Thus far, research on makerspaces is highly fragmented and lacks empirical insights into the moral foundations of makerspaces as future conduits of creativity and subsequent innovation performance. In this vein, questions remain for us to address: Are the moral foundations of makerspaces a source of innovation performance for their users? Are there specific recipes that pose critical success factors for user-driven innovation in a holistic model of makerspaces? To provide answers to these questions, the purpose of this study is to illuminate the moral foundations of makerspaces from a design perspective. Our conceptual model combines three interdependent perspectives: (1) the technical, (2) social, and (3) cognitive level of makerspaces. The technical aspects come to fruition through various facilities constituting traditional makerspaces. The social level considers the moral narratives of makerspace providers, whereas the cognitive level accounts for the team characteristics of makerspace

users. We applied a fuzzy-set qualitative comparative analysis (fsQCA) complemented by a necessary condition analysis (NCA) and bottleneck analysis to $N = 242$ users within $N = 53$ makerspaces. In summary, our model reveals three distinct paths to high-user innovativeness and five paths to low-user innovativeness. Essentially, the social and moral narratives of makerspaces can help large and experienced user teams maintain innovativeness, regardless of the technical facilities. However, the latter may compensate for the lack of such narratives in small and inexperienced user teams. All paths to low innovativeness show either a lack of such narratives or a lack of technical facilities. Our complementary analyses demonstrate the absence of single-necessary conditions for innovativeness in makerspaces. We conclude our study by highlighting the importance of essential narrative recipes for innovation in such makerspaces.

5.3 THEORETICAL FRAMEWORK

5.3.1 Contextualization: Makerspaces

In the context of makerspaces, there are often two overlapping movements: (1) the maker (Dougherty, 2012; Browder et al., 2019) and (2) the do-it-yourself (DIY) movement (Sarpong, Ofori, Botchie, & Clear, 2020; Ng, Arndt, & Huang, 2020). Individuals gather personally and digitally to experiment, work, learn, and collaborate in the maker movement. At its core, the maker movement stems from the democratization of technologies and tools that have become more accessible over the years (Browder et al., 2019). In contrast, the DIY movement focuses on creating, customizing, or repairing objects without specific training or in-depth knowledge, principally from home (You, Chen, Agyapong, & Mordi, 2020).

Given this conceptual overlap, various related terms prevail for similar places, such as makerspaces, coworking-spaces, DIY labs, FabLabs, or hackerspaces (Bouncken & Reuschl, 2018; Ng et al., 2020; Sarpong et al., 2020). However, there is no broad definition that covers all these spaces. Therefore, we define makerspace as an umbrella term for all areas where individuals or communities can physically access technologies and make things in a physical space. These spaces are community-shared facilities for designing, prototyping, or DIY-manufacturing. Users of makerspaces access digital and manufacturing technologies ranging from 3D printers, laser cutters, various milling devices, workbenches, and everyday tools, such as hammers and saws, that enable the creation of material artifacts. Primarily, hobbyists, artists, students, entrepreneurs, engineers, and technology inventors use these

facilities, often owned by specialized makerspace providers or public institutions, such as universities or schools (Blikstein & Krannich, 2013; Farritor, 2017; Browder et al., 2019).

5.3.2 Innovation in makerspaces

Shared spaces as sources of innovation have been the topic of many recent studies (Capdevila, 2015; Farritor, 2017; Bouncken & Reuschl, 2018; Halbinger, 2018). Innovation involves creative processes and the exchange of knowledge, expertise, and ideas between different people (Anzola-Román, Bayona-Sáez, & García-Marco, 2018), combining them in novel ways that challenge established belief systems and routines (Dougherty, Borrelli, Munir, & O'Sullivan, 2000). A fundamental assumption about the creativity and innovativeness of users in makerspaces is that interactions and collaboration between members of the same space enable opportunities for knowledge sharing (Parrino, 2015; Bouncken, Pesch, & Reuschl, 2016). Makerspaces welcome inventors at all stages of the innovation process, from the ideation phase to the testing phase (Bergman & McMullen, 2020). Through interaction and collaboration, makers can identify problems early and make appropriate adjustments, leading to immediate feedback and improvement (van Holm, 2017).

Shared social spaces (e.g., cafeterias, lounges, or bars) within makerspaces promote networking, knowledge exchange, and collaboration (Gandini, 2015; Bouncken & Reuschl, 2018; Bouncken et al., 2021). Furthermore, makerspaces often offer creative environments where makers with different motives and backgrounds can interact, be inspired by each other, and use synergies (Capdevila, 2015; Pinkse & Groot, 2015). This diversity and high density of motivated and committed makers lead to a climate of engagement. Fundamentally, the innovative power of makers lies in their strong interest in pursuing their approaches, detached from established social roles. New approaches to problem-solving contribute to innovation, further promoted by shared technologies and tools (Mortara & Parisot, 2016).

In summary, shared technologies combined with professional and social interactions enable open knowledge exchange and collaboration between users, forming makerspaces into a nucleus for crowd-based innovation (Harhoff, Henkel, & Von Hippel, 2003; Bouncken, Brem, & Kraus, 2016; Gerdenitsch, Scheel, Andorfer, & Korunka, 2016; Mortara & Parisot, 2018; Bouncken, Ratzmann, et al., 2020; Rayna & Striukova, 2021).

5.3.3 The trinity of makerspaces

5.3.3.1 Technical level

One of the primary motivations for entering makerspaces is to access technologies and equipment to which users would otherwise have little access, leading to the democratization of potential innovation and independence from established institutions (Browder et al., 2019; Bergman & McMullen, 2020). In makerspaces, 3D printers are the predominant technology for creating prototypes (Rieken, Boehm, Heinzen, & Meboldt, 2020). A fundamental factor that promotes the innovation performance of makerspace users is the availability of technologies and equipment that enable users to realize their ideas semi or professionally and create prototypes before producing small-scale productions (Rayna & Striukova, 2016; Bergman & McMullen, 2020). This presence of technologies and tools significantly shapes the spatial architecture and infrastructure of makerspaces (Allen & Henn, 2007). In addition to the crafting area where these devices are located and used, shared social areas and support structures (e.g., storage areas, locker rooms) can also promote desired outcomes (Doorley & Witthoft, 2012). The interaction of various socio-material facilities and workspaces can further support the innovation performance of users in makerspaces (Farritor, 2017; Bouncken et al., 2021).

Proposition 1. *The number of different facilities in makerspaces stimulates the innovativeness of the users operating in these makerspaces.*

5.3.3.2 Social level

A good makerspace should offer a community (Blikstein & Krannich, 2013). A community is a group of individuals who share common interests and goals, are formed to solve problems together, develop new ideas, and share knowledge (Kuznetsov & Paulos, 2010; Garrett, Spreitzer, & Bacevice, 2017). Hence, makerspaces are places where people collaborate on projects regardless of their experience and skills (Bevan, Gutwill, Petrich, & Wilkinson, 2015). Through the day-to-day interactions of users, workspaces can develop a collective identification expressed through a sense of community and emotional and behavioral belonging (Garrett et al., 2017; Al-Omouh, Orero-Blat, & Ribeiro-Soriano, 2021). As building a sense of community is a critical factor in makerspaces, providers try to foster collaboration through a creative and supportive environment, infrastructure, and

events such as workshops (Cabral & Van Winden, 2016; Garrett et al., 2017; Blagoev, Costas, & Kärreman, 2019). Additionally, the offering of affective commons forms a “vibe” of the makerspace (Waters-Lynch & Duff, 2021). In contrast to traditional organizations, makerspaces have no uniform formation of an organizational identity through bureaucracy and hierarchy. Users can freely come and go without any constraints. Accordingly, boundaries and memberships in makerspaces tend to be unclear and blurred (Schreyögg & Sydow, 2010). Based on the principles of the sharing economy, few formal rules prevail in makerspaces, resulting in collective self-governing by the community (Kostakis, Niaros, & Giotitsas, 2015; Davies, 2017). Accordingly, challenges for makerspaces on a social level are that there are usually information asymmetries between providers and potential users. Conversely, organizational fluidity and flexibility are not advantageous unless there is little formality. To inform potential users and thus contribute to a reduction in asymmetry, providers need to make information available (Gao, Yu, & Cannella, 2016). Through communication and storytelling, providers inform the overall guiding values within the makerspace community and provide legitimacy to potential users (Lounsbury & Glynn, 2001; Martens, Jennings, & Jennings, 2007; Gao et al., 2016; Bouncken & Tiberius, 2021). Potential users can orient themselves by the setting of context through storytelling in their narratives. These narratives determine a few central norms that contribute to the collective work and relationships among users of makerspaces.

On the social level, by including elements of corporate social responsibility (CSR) in the makerspace’s narrative, the focus is on strengthening the makerspace’s legitimacy (Weber & Fehre, 2020) and building a responsible community of makers. CSR encompasses economic responsibility but also the voluntary and systematic inclusion of environmental and social concerns in decision-making. Thus, the economic, social, and environmental spheres are the three main areas where CSR measures are usually implemented based on the triple bottom line theory (Aguinis & Glavas, 2012). CSR incorporates legal, economic, philanthropic, and ethical responsibilities into decision making, making CSR encompass a wide range of behaviors and implied shared values (Carroll, 1979; Porter & Kramer, 2006). The social dimension includes an organization’s responsibility for social issues and all measures that focus on the organization’s community (Porter & Kramer, 2006). The environmental dimension addresses the organization’s responsibility for the environment and related issues, such as energy, waste, and pollution (e.g., Babiak & Trendafilova, 2011). Due to ecological and social responsibility, sustainability is increasingly coming to the fore,

whereby existing technologies improve their sustainability and ecological efficiency. This trend has led to various adaptations of DIY business strategies and sustainable innovation (Porter & Kramer, 2006; Hockerts & Wüstenhagen, 2010; Sumrin et al., 2021; Upadhyay, Kumar, Kumar, & Alzaben, 2021). Thus, we assume that CSR framing can increase the innovation performance of makerspace users (McWilliams & Siegel, 2000; Wagner, 2010; Gallego-Alvarez, Prado-Lorenzo, & García-Sánchez, 2011; Mishra, 2017). Makerspaces can combine several narratives if they are complementary (Herzenstein, Sonenshein, & Dholakia, 2011). Alongside the close connection between CSR and business ethics (Ferrell, Harrison, Ferrell, & Hair, 2019), CSR also has close ties with moral foundations. Turiel (1983, p. 3) defines morality as “prescriptive judgments about justice, rights, and welfare that relate to how people should relate to each other,” and morality further affects an individual’s evaluation of the circumstances of ethical problems (Valentine & Godkin, 2019). Moral foundations suppress or regulate selfishness and enable social life (Haidt & Graham, 2007; Graham et al., 2013). Moral foundation theory can help conceptualize and measure such beliefs (Haidt & Graham, 2007). Based on this, Graham et al. (2013) identified five moral foundations on which individuals developed their moral views and provided a taxonomy for the foundations of moral judgments, intuitions, and concerns. These five moral foundations account for individualizing and binding foundations. The individualizing foundations include fairness/reciprocity and harm/ care. The binding foundations include ingroup/loyalty, authority/respect, and purity/sanctity (Graham et al., 2013). Fundamentally, communicating moral values in the narrative demonstrates to potential users that morality is central to collaboration in the makerspace. Similarly, studies indicate that the moral orientation of organizations may have a positive impact on innovation performance (Cheng & Chen, 2016). Summarizing, we consider makerspaces as a valuable context for exploring the relationship between CSR and moral foundation narratives and their impact on innovation performance from makerspace users.

Proposition 2. *Social responsibility in makerspaces stimulates the innovativeness of the users operating in these makerspaces.*

Proposition 3. *Moral foundations in makerspaces stimulate the innovativeness of the users operating in these makerspaces.*

5.3.3.3 Cognitive level

With the establishment of shared workspaces and open-plan communal offices, members are encouraged to work alongside each other (Farritor, 2017), which is further enhanced by shared social spaces (Gandini, 2015; Bouncken & Reuschl, 2018). In makerspaces, this physical proximity necessarily leads to social interactions and communication, which, in turn, leads to a cognitive convergence of users. In combination with shared values, attitudes, or objectives, altruistic behaviors among users in makerspaces evoke and encourage the exchange of knowledge and ideas, fostering inter-actor connections (Al Saifi, Dillon, & McQueen, 2016; Gerdenitsch et al., 2016; Waters-Lynch & Potts, 2017; Al-Omouh et al., 2021). Inter-actor connections can be intensified through mentorship when professionals and experienced makers are available in makerspaces to advise and support novice makers. This mentorship is necessary to transfer tacit knowledge and create mutual understanding (Bouncken, Pesch, et al., 2016, Bouncken & Aslam, 2019; Sarpong et al., 2020; You et al., 2020). In addition to mentorship, events such as workshops or trainings lead to knowledge transfer.

At the cognitive level, knowledge exchange is an essential process through which many new ideas emerge and existing ones mature. Furthermore, sharing knowledge among users promotes ideas by creating new ideas and combining existing ones through creativity. People with similar knowledge can learn efficiently from each other while expanding their cognitive domains (Nooteboom, 2000). Contrarily, a certain cognitive distance increases learning potential due to the different knowledge bases needed for new ideas and creativity (Cohendet & Llerena, 1997). Makerspaces impact users' ideation and creativity by expressing themselves creatively and generating new ideas (Barrett, Davidson, Prabhu, & Vargo, 2015) through feedback in self-formed teams or groups (Kuznetsov & Paulos, 2010). By this logic, team composition should impact performance and innovation (West, 2002). Relevant team characteristics include team size and related work experience. Larger teams may lead to increased diversity and density of ideas and process them more comprehensively (West et al., 2003), resulting in higher innovation performance.

Some scholars believe that more experience leads to members sharing less and becoming more isolated from new sources, feedback, and information (West & Anderson, 1996; Hülshager, Anderson, & Salgado, 2009). The resulting lack of knowledge sharing inhibits innovation. Contrary to traditional organizations, the higher work experience of users in

makerspaces leads to an increase in knowledge and the quality of inter-actor collaboration (Rese, Kopplin, & Nielebock, 2020; Görmar, Barwinski, Bouncken, & Laudien, 2021; Bednár, Danko, & Smékalová, 2021). Therefore, an increased number of mentorships in makerspaces facilitate rich knowledge exchanges. Experienced users have more knowledge and skills and tend to use their experiences to grasp contexts and evaluate ideas faster (D’Este, Mahdi, Neely, & Rentocchini, 2012; Ardito, Natalicchio, Appio, & Petruzzelli, 2021). Thus, we conjecture:

Proposition 4. *Team size in makerspaces stimulates the innovativeness of the users operating in these makerspaces.*

Proposition 5. *Users’ work experience in makerspaces stimulates the innovativeness of the users operating in these makerspaces.*

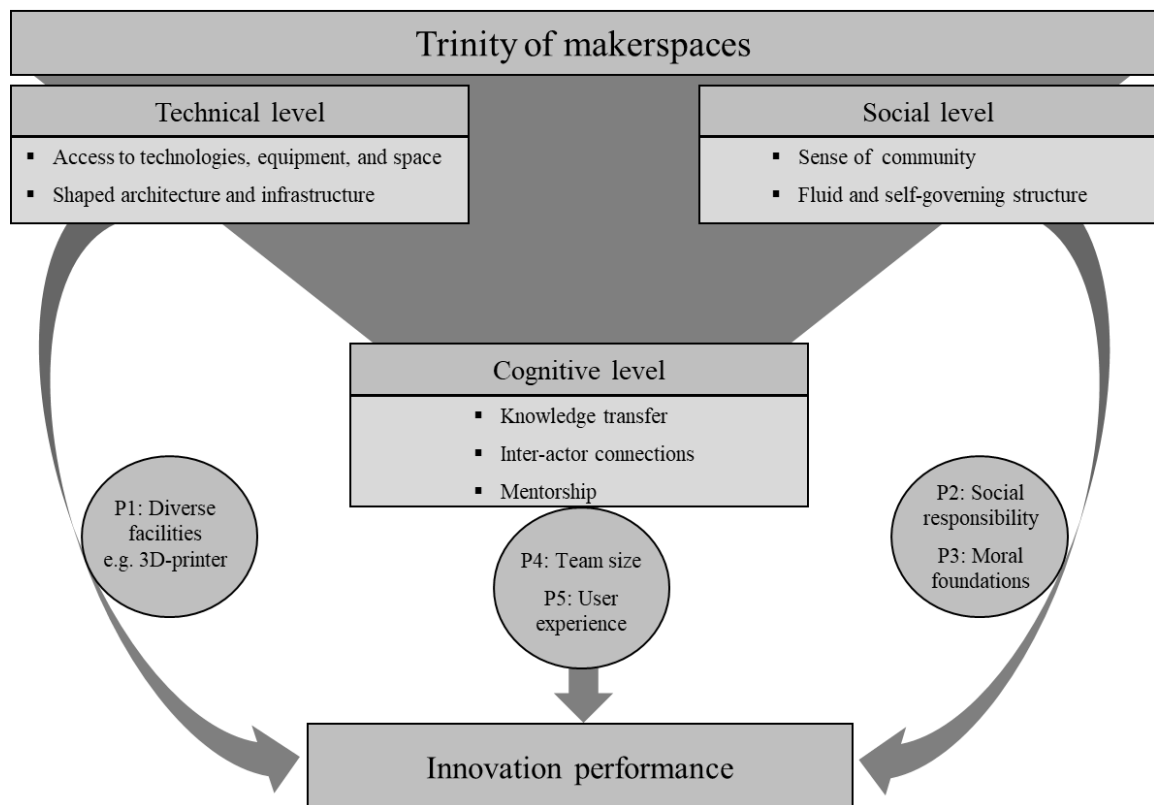


Figure 7: *Conceptual model and propositions.*

5.4 METHODOLOGY

5.4.1 Sample

According to the Global Coworking Growth Study, in partnership with the world's largest coworking listing platform, coworker.com, there are currently over 20,000 coworking-spaces worldwide, with an average space size of 7,308 sq. ft. and an average space capacity of 83 people (Di Risio, 2020). Makerspaces often accompany these coworking-spaces in major cities, with over 2,300 makerspaces worldwide (Halbinger, 2020). The primary data for this study comes from two different sources.

First, we surveyed $N = 242$ individual users from $N = 53$ makerspaces worldwide (i.e., Austria, China, Columbia, Germany, Hungary, Montenegro, USA) during 2018–2019. The providers of these makerspaces provided us with detailed information about unique facilities and demographic characteristics. On average, the providers established these makerspaces in 2013 ($SD = 1.3$ years) in metropolitan areas with a population of 9.5 million ($SD = 6.8$ million) and offered their facilities to 341 users per month ($SD = 238.4$). Furthermore, the average age of the participating users is 28.5 years ($SD = 5.5$ years); the most common education level is a bachelor's degree (67%), with a follow-up work experience of 5.6 years ($SD = 4.4$ years). The average number of participating users per makerspace is 4.6 ($SD = 9.2$) in a multi-level setting of users nested in unique makerspaces. Every responding user further represents a team of 7.9 team members ($SD = 5.4$). We, therefore, averaged responses from members of the same team before calculating aggregates at the makerspace level.

Second, we scraped the textual content of web pages for all $N = 53$ makerspaces in 2019 to analyze underlying narratives and deep beliefs via established libraries of phenomena under study using computer-aided text analysis (CATA). The average number of words serving as the basis for the textual analysis at the makerspace level after excluding stop words and special characters is 9,164 ($SD = 10,749$).

5.4.2 Analysis

This study focuses on neo-configurational methods to overcome the limitations of traditional regression-based analysis (Misangyi et al., 2017; Greckhamer, Furnari, Fiss, & Aguilera, 2018). First, we used fsQCA 3.1 (Ragin, 1987) with set-theoretic thresholds to transform raw data into fuzzy membership scores (i.e., full-out at 0.05, cross-over at 0.5, and full-in at 0.95). The Quine-McCluskey algorithm separates core and peripheral causal conditions

dependent on easy and hard counterfactuals, informing us about sufficient but not necessary causality. Complementary to the sufficiency analysis, we applied a preliminary necessity analysis to identify consistent single-necessary causes (Ragin, 2008). Second, NCA (Dul, 2016) focuses on necessary but not sufficient causality and complements consistency and coverage with effect sizes and non-parametric inferential statistics from 5,000 bootstrapping procedures using the NCA package for R (Dul, 2019). Third, we maximize our insights by running a bottleneck analysis to identify critical conditions. This analysis informs us of the maximum levels of an outcome that can be realized in the total absence of singular conditions. Lower maximum levels indicate constraining restrictions and more significant bottlenecks (Dul, 2020).

5.4.3 Measures and calibration process

All measures originate from different sources to circumvent common method bias implicit to single-source data (Podsakoff, MacKenzie, & Podsakoff, 2012). Our latent dependent measure of innovation performance builds on three 5-point Likert-typed items by Lee and Colarelli O'Connor (2003) that show great overall fit after performing a principal component factor analysis at the individual level (1: “*Our innovations incorporate technology which is new to customers,*” mean = 3.45, SD = 1.29, loading $\lambda = 0.840$; 2: “*Our innovations offer new benefits to the customers,*” mean = 3.90, SD = 1.18, $\lambda = 0.876$; 3: “*Our innovations introduce many completely new features to the market,*” mean = 3.77, SD = 1.19, $\lambda = 0.884$; Cronbach’s $\alpha = 0.832$, composite reliability CR = 0.900, average variance extracted AVE = 0.751, variance inflation factor VIF = 1.03). We further aggregated the factor scores at the makerspace level due to significant between-variance ($F(52;189) = 1.322$, $p = .038$; ICC (1) = 0.090, ICC (2) = 0.311) and calibrated these scores at typical levels of low and high membership (i.e., full-out = -1 $\hat{=}$ cumulated empirical percentage 15%, cross-over = 0 $\hat{=}$ 47%, full-in = + 1 $\hat{=}$ 79%).

Team size is the absolute number of team members responding users refer to (full-out = 2 $\hat{=}$ 6%, cross-over = 10 $\hat{=}$ 83%, full-in = 20 $\hat{=}$ 95%). *Users’ work experience* refers to the average number of years since graduation (full-out = 0 $\hat{=}$ 4%, cross-over = 5 $\hat{=}$ 54%, full-in = 10 $\hat{=}$ 85%). *The number of facilities* is an aggregation of multi-categorical binary indicators (full-out = 0 $\hat{=}$ 37%, cross-over = 1 $\hat{=}$ 44%, full-in = 10 $\hat{=}$ 98%; e.g., 42% 3D printing, 26% library, 13% audio recording technology, etc.). For the measurement of narratives within web pages, we relied on established libraries of CSR; Pencle & Malaescu,

2016) consisting of four subdimensions – (1) employees, (2) environment, (3) human rights, and (4) social and community. In addition, we measured moral foundations (MF; Graham, Haidt, & Nosek, 2009) via five subdimensions – (1) authority, (2) fairness, (3) harm, (4) ingroup, and (5) purity. Next, we calculated intensity scores per 1,000 words for each subdimension, standardized these intensities, and calibrated the outcomes (i.e., full-out = –1, cross-over = 0, full-in = +1). Finally, a fuzzyor- linkage connects all first-order subdimensions of CSR and MF (i.e., makerspaces can choose different paths to communicate the underlying second-order narratives). The following real-life example shows narratives of CSR in italics and MF in bold: “We offer fair working conditions, fair access for all participants, and facilities that promote work-life balance. In return, we expect that our users are conscientious and fair in their use of the facilities and follow our clean-desk policy.” Table 15 summarizes the descriptive statistics and bivariate correlations at the makerspace level.

	Mean	SD	S	K	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Innovation performance	.00	1.00	-.73	.40	(.88)	-.15	.18	-.02	.17	.03	.02	.01	.08	.16	-.05	-.09	.01	.07	.20
2. Team size	7.88	5.35	1.82	3.46	-.05	(.94)	-.30	.04	.02	.08	-.08	.12	-.13	-.07	.04	.06	.03	-.16	.07
3. Work experience	5.58	4.44	1.48	3.24	.16	-.28	(.82)	.02	.14	.02	.04	.02	.23	.18	.15	.03	.03	.21	-.31
4. Number of facilities	2.85	3.50	.75	-.84	-.10	.07	-.03	(.92)	-.21	-.10	-.19	-.13	-.13	-.14	.07	.20	-.24	.01	-.39
5. Corporate social responsibility (CSR)	30.12	10.04	.80	1.01	.07	-.03	.27	-.21	(.56)	.38	.66	.61	.54	.74	.42	.11	.17	.36	.05
6. Moral foundations (MF)	3.14	1.87	2.47	10.22	-.03	-.11	.28	-.08	.64	(.29)	.29	.20	.35	.32	.46	.55	.32	.38	.28
7. CSR: Employee	33.85	13.48	.69	.23	.08	-.03	.24	-.18	.89	(.88)	.12	.63	.76	.35	.21	.14	.25	.11	
8. CSR: Environment	25.92	11.31	1.25	2.35	-.02	.12	-.07	-.17	.51	.15	.21	(.83)	.10	.32	.44	-.04	.02	.10	-.01
9. CSR: Human rights	20.21	11.04	1.38	3.06	.02	-.14	.42	-.15	.79	.79	.71	.06	(.81)	.61	.31	.13	.24	.74	-.02
10. CSR: Social & community	40.51	14.56	.56	.88	.11	-.04	.27	-.17	.94	.61	.81	.40	.71	(.84)	.35	.25	.01	.35	.08
11. MF: Authority	3.36	2.50	.68	-.20	.03	-.04	.11	.12	.46	.54	.34	.40	.35	.38	(.90)	.27	.01	.24	-.32
12. MF: Fairness	1.57	1.49	.92	.47	-.13	.07	-.05	.25	.09	.20	.06	-.03	.07	.15	.25	(.88)	.02	.10	-.08
13. MF: Harm	2.58	2.98	3.11	13.76	-.02	.03	.16	-.18	.18	.45	.25	-.03	.22	.13	.04	-.04	(.67)	.24	.03
14. MF: In-group	7.64	7.22	3.30	15.63	-.03	-.16	.29	-.09	.58	.89	.39	.08	.80	.57	.30	-.01	.17	(.65)	-.14
15. MF: Purity	.54	.73	1.60	2.07	.22	.02	-.26	-.37	-.04	-.13	.03	-.08	-.12	.01	-.16	-.05	-.12	-.16	(.86)
16. Number of words (in 1,000)	9.16	10.75	1.77	2.77	.09	.04	-.25	-.12	-.09	-.20	-.09	.03	-.18	-.05	-.03	-.16	.00	-.22	.07

Notes: N=53; bold Pearson rho are significant at $p \leq .05$, SD=standard deviation; S=skewness; K=kurtosis; bivariate correlations of raw variables below diagonal, correlations of calibrated variables above diagonal, and shared variances in brackets on diagonal; raw CSR & MF are average scores of subdimensions, whereas calibrated CSR & MF use 'fuzzyor'-linkage (i.e., highest membership score of its subdimension).

Table 15: Descriptive statistics and bivariate correlations.

5.5 RESULTS

5.5.1 Fuzzy-set qualitative comparative analysis (fsQCA)

We followed recommendations by Ragin (2008) and first performed a necessity analysis of single conditions for high and low levels of innovation performance. Table 16 shows present and absent (=~) single conditions by consistency and coverage equivalent to reliability and variance explanation measures. A consistency value greater than 0.8 indicates consistently necessary single causes of innovation performance or a lack thereof. Coverage values greater than 0.5 imply meaningful single causes.

	Innovation Performance		~Innovation Performance	
	Consistency	Coverage	Consistency	Coverage
technical facilities	0.452	0.607	0.466	0.552
~technical facilities	0.667	0.586	0.668	0.518
social responsibility	0.827	0.615	0.763	0.501
~social responsibility	0.329	0.612	0.414	0.679
moral foundations	0.879	0.572	0.878	0.504
~moral foundations	0.238	0.688	0.254	0.649
team size	0.374	0.635	0.454	0.679
~team size	0.811	0.627	0.756	0.516
work experience	0.632	0.681	0.548	0.521
~work experience	0.555	0.582	0.664	0.615

Notes: ~ implies negated membership (=fuzzynot).

Table 16: QCA necessity analysis.

Remarkably, CSR, MF, or small teams are consistent single necessary causes of innovation performance. Interestingly, MF also consistently explained a lack of innovation performance, indicating a potential double-edged sword of moral foundations. A complementary NCA further deciphers these ambivalent findings.

Next, we applied fsQCA to our five proposed conditions of high (low) innovation performance within $N = 53$ makerspaces, yielding 32 theoretical configurations ($=2^5$). Nineteen empirical configurations with $N \geq 1$ indicate limited diversity. Table 17 summarizes three (five) consistent (≥ 0.8) causal paths to high (low) innovation performance.

	(1) High Innovation Performance					(2) Low Innovation Performance				
	1a	1b	1c	2a	2b	2c	2d	2e		
Technical level										
P1. Many facilities		⊗	●	⊗		⊗	●	●		
Social level										
P2. High social responsibility	●	●	⊗	⊗	⊗	●	⊗	⊗		
P3. High moral foundations	●	⊗	⊗		⊗	●	⊗	⊗		
Cognitive level										
P4. Big teams	●	⊗	⊗	⊗	⊗	●	●	●		
P5. High work experience	●	●	⊗	⊗	●	⊗	⊗	⊗		
Consistency	0.847 (0.839)	0.852 (0.842)	0.835 (0.860)	0.811 (0.827)	0.875 (0.865)	0.817 (0.796)	0.916 (0.858)	0.916 (0.820)		
Raw Coverage	0.299 (0.300)	0.144 (0.174)	0.104 (0.126)	0.221 (0.258)	0.161 (0.162)	0.284 (0.306)	0.101 (0.255)	0.101 (0.156)		
Unique Coverage	0.188 (0.183)	0.039 (0.042)	0.036 (0.034)	0.054 (0.054)	0.053 (0.046)	0.131 (0.082)	0.016 (0.032)	0.016 (0.004)		
Overall Solution Consistency		0.837 (0.835)				0.807 (0.784)				
Overall Solution Coverage		0.377 (0.391)				0.435 (0.484)				

Notes: black circles indicate the presence, crossed white circles indicate the negation, and blank spaces signify absence of a causal condition. Big circles indicate parsimonious solution with fit evaluation in parentheses.

Table 17: Configurations for achieving high vs. low performance ($N \geq 1$, $C \geq 0.8$).

High solution 1a suggests that large and experienced teams still require narrative guidance to maintain innovativeness regardless of supportive technical facilities. Interestingly, high solution 1c reveals that small, inexperienced work groups benefit from technical facilities despite a lack of narrative guidance. High solution 1b shows a hybrid path to innovation performance. Small and experienced teams require social responsibility without MF or technical facilities. In contrast, all five paths to low innovation performance show a lack of either technical facilities (2c), guiding narratives (2b, 2d, & 2e), or both (2a). Notably, large inexperienced teams consistently underperform.

5.5.2 Necessary condition and bottleneck analysis

We performed two complementary analyses to shed light on positively contrarian cases that follow the necessary but not sufficient logic of causality (Dul, 2016). First, a multivariate NCA identifies single-necessary causes using alternative ceiling lines that separate empty ceiling zone C in the upper-left quadrant from the entire empirical scope S. Effect sizes d ($=C/S$) reveal the causal structure in the case of asymmetric necessity (i.e., X is significantly necessary for Y but not vice versa). Table 18 shows the effect sizes for all bivariate combinations of the proposed conditions with (linear) CR-FDH ceilings (Dul, 2019), including all subdimensions of CSR and MF. For example, CSR is essential for achieving ingroup-MF ($d = 0.381$) but not vice versa ($d = 0.000$). On average, MF unfolds a medium ($d = 0.150$) yet insignificant effect size on the remaining model conditions. There are no single-necessary causes of innovation performance in makerspaces. Despite MF being a necessary condition of low and high innovativeness (c.f. Table 16), there is a lack of significance ($d = 0.065$, $p > .05$). Interestingly, technical facilities are not necessary at all ($d = 0.000$). Moreover, most CSR-subdimensions are interdependent, whereas MF-subdimensions exist independently.

Bottleneck analysis perfectly complements multivariate NCA by quantifying the maximum percentiles of dependent conditions Y in the absence of single conditions X. Table 19 summarizes these bottlenecks, defined by the low percentiles of Y.

X:	Y:	1	2	3	4	5	6	Ø	7	8	9	10	11	12	13	14	15	Ø
1_High_innovation	0.500	0.081	0.500	0.028	0.007	0.002	0.001	0.024	0.002	0.009	0.006	0.008	0.008	0.005	0.013	0.006	0.088	0.016
2_Big_teams	0.000	0.500	0.004	0.022	0.017	0.000	0.009	0.009	0.074	0.021	0.022	0.019	0.013	0.000	0.046	0.015	0.000	0.023
3_High_experience	0.020	0.012	0.500	0.114	0.001	0.000	0.029	0.029	0.001	0.011	0.049	0.003	0.019	0.003	0.033	0.002	0.001	0.014
4_Many_facilities	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5_High_CSR	0.000	0.155	0.037	0.024	0.500	0.000	0.043	0.043	0.491	0.484	0.496	0.493	0.282	0.000	0.263	0.381	0.000	0.321
6_High_MF	0.065	0.257	0.150	0.190	0.088	0.500	0.150	0.150	0.209	0.155	0.336	0.181	0.456	0.536	0.479	0.447	0.486	0.365
7_Hi_CSR_Emp	0.022	0.040	0.018	0.021	0.014	0.018	0.022	0.022	0.500	0.014	0.312	0.296	0.035	0.022	0.217	0.193	0.031	0.140
8_Hi_CSR_Env	0.000	0.062	0.002	0.007	0.066	0.000	0.023	0.023	0.097	0.500	0.078	0.115	0.121	0.000	0.005	0.059	0.000	0.059
9_Hi_CSR_Hum	0.009	0.020	0.077	0.011	0.006	0.007	0.022	0.022	0.135	0.006	0.500	0.118	0.011	0.012	0.061	0.346	0.009	0.087
10_Hi_CSR_Soc	0.005	0.043	0.014	0.031	0.019	0.007	0.020	0.020	0.332	0.018	0.288	0.500	0.078	0.009	0.203	0.249	0.009	0.148
11_Hi_MF_Aut	0.003	0.033	0.000	0.024	0.009	0.001	0.012	0.012	0.074	0.016	0.128	0.083	0.500	0.001	0.028	0.015	0.003	0.044
12_Hi_MF_Fai	0.000	0.046	0.000	0.025	0.000	0.000	0.012	0.012	0.000	0.000	0.000	0.000	0.002	0.500	0.000	0.000	0.000	0.000
13_Hi_MF_Har	0.000	0.015	0.000	0.003	0.000	0.000	0.003	0.003	0.002	0.000	0.021	0.004	0.002	0.000	0.500	0.008	0.000	0.005
14_Hi_MF_Ing	0.000	0.038	0.163	0.019	0.000	0.000	0.037	0.037	0.017	0.000	0.253	0.036	0.000	0.002	0.024	0.500	0.000	0.042
15_Hi_MF_Pur	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000

Notes: Bold effect sizes indicate significance at $p < 0.05$; effect sizes: $0 < d < 0.1$ 'small effect', $0.1 \leq d \leq 0.3$ 'medium effect', $0.3 \leq d < 0.5$ 'large effect', $d \geq 0.5$ 'very large effect' (Dul, 2019).

Table 18: Effect sizes from NCA with CR-FDH-ceilings for fuzzy-set membership scores.

X:	Y:	1	2	3	4	5	6	Ø	7	8	9	10	11	12	13	14	15	Ø
1_High_innovation	NA	60%	90%	90%	90%	90%	90%	84%	90%	70%	90%	80%	90%	90%	80%	90%	50%	81%
2_Big_teams	NN	NA	60%	60%	30%	0%	NN	58%	40%	10%	0%	0%	20%	NN	10%	10%	NN	32%
3_High_experience	30%	20%	NA	60%	90%	90%	90%	58%	90%	20%	80%	80%	20%	90%	90%	90%	90%	72%
4_Many_facilities	NN	NN	NN	NA	NA	NN	NN	100%	NN	NN	NN	NN	NN	NN	NN	NN	NN	100%
5_High_CSR	NN	30%	70%	10%	10%	NA	NN	62%	0%	0%	0%	0%	30%	NN	20%	0%	NN	28%
6_High_MF	20%	10%	30%	50%	50%	NA	NA	32%	0%	40%	20%	10%	0%	0%	0%	0%	0%	8%
7_Hi_CSR_Emp	0%	10%	20%	10%	30%	20%	20%	15%	NA	40%	30%	30%	50%	10%	50%	50%	0%	33%
8_Hi_CSR_Env	NN	50%	60%	70%	50%	NN	NN	72%	30%	NA	50%	20%	60%	NN	90%	50%	NN	63%
9_Hi_CSR_Hum	10%	30%	50%	30%	50%	10%	10%	30%	20%	50%	NA	20%	30%	0%	40%	10%	0%	21%
10_Hi_CSR_Soc	10%	40%	20%	40%	50%	10%	10%	28%	20%	50%	30%	NA	40%	0%	50%	30%	0%	28%
11_Hi_MF_Aut	60%	20%	NN	80%	90%	90%	90%	73%	60%	80%	60%	70%	NA	90%	80%	90%	90%	78%
12_Hi_MF_Fai	NN	80%	NN	NN	90%	NN	NN	95%	NN	NN	NN	NN	90%	NA	NN	NN	NN	99%
13_Hi_MF_Har	NN	60%	NN	NN	80%	90%	NN	88%	90%	90%	90%	90%	90%	NN	NA	90%	NN	93%
14_Hi_MF_Ing	90%	40%	40%	40%	40%	NN	NN	68%	80%	NN	30%	60%	NN	80%	50%	NA	90%	74%
15_Hi_MF_Pur	NN	90%	NN	NN	90%	NN	NN	97%	NN	NN	NN	NN	NN	NN	NN	NN	NA	100%

Notes: NA='not available'; NN='not necessary' (equivalent to Y=100%); percentages in cells indicate maximum percentile of Y that can be realized in absence of X (i.e., X=0%), low percentages of Y characterize X as a bottleneck for realizing higher percentiles of Y; average percentages indicate how much of all Y can be realized in the absence of X (=Ø).

Table 19: Bottleneck analysis with CR-FDH-ceilings for fuzzy-set membership scores.

Notably, the absence of MF and work experience limits innovativeness to a maximum of 20–30%. Despite overall MF restricting innovativeness, the MF-subdimensions are less crucial in isolation ($\geq 60\%$). In contrast, CSR is not necessary for innovation performance. However, most CSR-subdimensions are substantial bottlenecks. For example, achieving innovativeness is impossible in the total absence of employee-based CSR ($=0\%$). Overall, we found support for all propositions, yet not for single necessary conditions of user innovativeness in makerspaces.

5.5.3 Robustness and sensitivity

Several additional tests inform us of the robustness and sensitivity of our findings. First, we applied a traditional multivariate linear regression analysis and yielded no significant (all β linear with $p > .10$) “net effects” (Ragin, 2008). Since most relationships in the social sciences are considered conditionally monotone rather than linear (Ganzach, 1998), we tested quadratic extensions of the proposed conditions of innovativeness (Fredrich, Bouncken, & Kraus, 2019). Again, parameters showed no significance (all $\beta_{\text{quadratic}}$ with $p > .10$). Second, we tried alternative settings in the calibration (e.g., factor scores ± 2 for full-out and full-in membership) and selection (e.g., consistency 0.75–0.85, $N \geq 2$) due to the well-known sensitivity of configurational results. These iterations produced qualitatively consistent findings. Third, we added the number of words to the correlation table to assess the sensitivity of core variables to web page length. No significant correlations emerge (c.f. Table 15). Similarly, we used an alternative formula that normalizes library length in calculating library-based intensity scores. Results remained qualitatively the same.

5.6 DISCUSSION

Previous research identified makerspaces as a source of crowd-based innovation but failed to propose a holistic model of critical success factors. Due to fragmented research, this study’s objective is to identify recipes for innovativeness in makerspaces. These unconventional sources of innovation are still not fully understood, especially the extent to which social and moral principles affect user innovativeness. Fluid and self-regulating open spaces meet societal demands for more sustainable and ecological behavior. Using fsQCA, NCA, and bottleneck analysis, this study investigates the effects of the underlying mechanisms of the technical, social, and cognitive levels of makerspaces on user innovativeness. Our findings support the contingent roles of MF, social responsibility, team size, user experience, and access to technical facilities—contributing to a better

understanding of this phenomenon (West et al., 2003; Gallego-Álvarez et al., 2011; Cheng & Chen, 2016; Rayna & Striukova, 2016; Farritor, 2017; Mishra, 2017; Ardito et al., 2021; Bouncken et al., 2021).

High solution 1a indicates that providers of makerspaces should communicate MF and CSR in their narratives to accommodate more challenging large and experienced user teams. In contrast, high solution 1b suggests that small and experienced teams communicate social responsibility without MF or technical facilities. MF and CSR framing increase the innovation performance of makerspace users by determining a few central norms that contribute to collective work and relationships among users in makerspaces (McWilliams & Siegel, 2000; Wagner, 2010; Gallego-Álvarez et al., 2011; Cheng & Chen, 2016; Mishra, 2017). Contrary to the prevailing opinion that innovation performance in makerspaces is determined entirely by many facilities (Rayna & Striukova, 2016; Browder et al., 2019; Bergman & McMullen, 2020), this study identified recipes of various moral, social, and team characteristics. With narratives building on morality and socio-ecological responsibility, a specific type of user will engage in community building through collaboration and ethical principles (Lounsbury & Glynn, 2001; Martens et al., 2007; Graham et al., 2013; Bouncken & Reuschl, 2018). In predominantly large teams, knowledge exchange is more extensive, and teams have higher member diversity, which further promotes the joint generation of knowledge and new ideas. Concurrently, accumulated work experience can help users identify ideas with high innovation potential and increase their knowledge base (West et al., 2003; D'Este et al., 2012; Ardito et al., 2021).

The third high solution 1c promotes focusing on providing technical facilities to small and inexperienced teams without developing moral or socio-ecological narratives to boost their innovation performance. The provision of these facilities promotes user innovativeness, confirming most of the literature on makerspaces (Rayna & Striukova, 2016; Farritor, 2017; Bergman & McMullen, 2020; Bouncken et al., 2021). Yet, the lack of moral and socio-ecological foundations seems to only work with small and inexperienced teams. This young and inexperienced generation is optimistic, community-oriented, and talented in using technology (Howe & Strauss, 2000; Prensky, 2001). Based on their inexperience, young users tend to prefer the concept of open and fluid work structures and are faster at learning novel technologies, which leads to innovation performance. A lack of experience might be compensated for by the existence of various facilities, which inexperienced and semi-

professional users can also use nowadays (Kuznetsov & Paulos, 2010; Hilton, Hughes, Little, & Marandi, 2013; Bouncken et al., 2021). In combination with these factors, small teams are conducive to innovation performance. They tend to limit the number and variety of creative ideas and make it easier to pursue specific ones. Furthermore, small and inexperienced teams might be more open to experimentation. Apart from the high solutions, the low solutions indicate that inexperienced teams consistently underperform, and a lack of either technical facilities (2c), guiding narratives (2b, 2d, & 2e), or both (2a) lead to low innovation performance of makerspace users. The low solutions reveal which recipes are detrimental to users' innovation performance. Given that the high and low solutions are in line with each other, the results reveal substantial gains in knowledge for research and practice.

This study further demonstrates how users' innovativeness can improve through the configurations of specific recipes and is not dependent on a single-necessary condition. This insight is consistent with the findings of other researchers, who identified several factors that promote innovation performance in shared workspaces (e.g., Cabral & Van Winden, 2016; Farritor, 2017; Bouncken, Laudien, Fredrich, & Görmar, 2018; Svensson & Hartmann, 2018). Ultimately, makerspaces provide unconventional sources of innovation. Future research should follow this multifactorial example and identify promising factors for further inquiry. Factors that affect both the environment and the composition of the community in makerspaces should be considered, e.g., whether makerspaces are located in rural or urban areas or how the degree of user interdisciplinarity affects innovation performance (Bathelt, Malmberg, & Maskell, 2004; Ibert, 2010; Bouncken, Kraus, & Martínez-Pérez, 2020; Haeussler & Sauermann, 2020).

Contrary to the literature, this study demonstrates that technical facilities are not a bottleneck for boosting innovation performance in makerspaces (Rayna & Striukova, 2016; Bergman & McMullen, 2020). Many technologies, such as 3D printers, are cheaper and affordable for everyone nowadays; therefore, the provision in makerspaces is no longer key for innovative performance. The purpose of entering makerspaces is increasingly shifting from accessing technologies to accessing knowledge and the community (Dougherty, 2012).

Our findings should be viewed in light of this study's limitations, which leaves room for improvements for future research. First, we did not differentiate makerspaces by labels such as FabLabs, coworking-spaces, hackerspaces, or DIY-laboratories. Therefore, the results for

distinct subcategories might be different. The generalizability of our results is also limited due to our research design. Future research should apply the identified recipes in various contexts and test for their applicability. Second, future studies should consider other factors in shared spaces, such as the quality of knowledge transfer, specific technologies, or other narratives shaping the community in makerspaces. Similarly, providers and users might have unique strategy frames (Klimas, Czakon, & Fredrich, 2021). Third, panel dataset-theoretic research could better reveal the temporal ordering and dynamics of human interactions in teams using a longitudinal approach (Garcia-Castro & Arino, 2016). Fourth, narratives do not necessarily reflect reality and may be subject to strategic marketing decisions by the providers of makerspaces. For example, these providers might tell morally laden stories on their websites in a way that they consider conducive to the success of their space. Fifth, the surveyed makerspaces are all located in urban areas, so we did not consider suburban and rural areas. Sixth, users might not necessarily adopt novel technologies and prefer vintage solutions (Schiavone & MacVaugh, 2009; Schiavone & Borzillo, 2014). Finally, we draw attention to a vigorous discourse in MF-theory research on confirming the binding foundation purity/sanctity referred to by Graham et al. (2013) (see Gray & Keeney, 2015; Graham, 2015). Considering this fact, one possible limitation of the paper is that we included purity/sanctity in measuring MF.

5.7 CONCLUSION

The current study identifies MF in makerspaces as an unconventional source of innovation. Several crucial recipes pose critical success factors for user-driven innovation in a holistic model of makerspaces. First, providers of makerspaces should communicate MF and CSR in their narratives to accommodate more challenging large and experienced user teams. Alternatively, makerspaces can provide more technical facilities to small and inexperienced teams to boost their innovation performance. Another way to promote user innovativeness is to invest in technical facilities and attract small and inexperienced user teams without developing moral or socio-ecological narratives. Yet, the lack of moral and socio-ecological foundations seems to only work with small and inexperienced teams. Second, this study demonstrates how users' innovativeness can improve through the configurations of specific recipes and is not dependent on a single-necessary condition. Third, this study indicates that technical facilities are not a bottleneck for boosting innovation performance in makerspaces.

Overall, we advocate neo-configurational approaches for theory building and illuminate makerspaces as unconventional and inexhaustible sources of innovation. Our findings reveal ideal settings for user innovativeness based on technical, social, and cognitive recipes that we label as the “trinity of makerspaces.”

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6 ACCEPTANCE OF MATCHMAKING TOOLS IN COWORKING-SPACES: AN EXTENDED PERSPECTIVE

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6.1 ABSTRACT

An extended technology acceptance model for matchmaking tools in coworking-spaces is presented and tested among 92 German coworkers. Advancing previous research, hedonic and community-related aspects are integrated into a framework based on the extended unified theory of acceptance and use of technology (UTAUT2). Coworkers emphasize a matchmaking tool's productivity aspects, which are positively moderated by their sense of community. Hedonic motivation (HM) and personal innovativeness contribute to usage intention, while effort expectancy is not a driver. The influence of HM is negatively moderated by sense of community, suggesting that a favourable social atmosphere that is explorable in person acts as a partial substitute for the enjoyment of tool usage. Surprisingly, satisfaction with face-to-face activities does not affect their perception of a matchmaking tool.

Keywords: Coworking-spaces; Matchmaking Tools; Sense of Community; Technology Acceptance; Partial Least Squares; Structural Equation Modeling.

6.2 INTRODUCTION

Coworking-spaces are membership-based innovation hubs for cross-fertilization, inspiration, professional exchange, and economic environments that provide essential infrastructure for daily business (Bouncken & Reuschl, 2018; Garrett, Spreitzer, & Bacevice, 2017; Gerdenitsch, Scheel, Andorfer, & Korunka, 2016). A growing body of evidence indicates that interaction indeed yields positive impacts on coworkers, such as enhancing knowledge sharing and creative performance (Rese, Kopplin, & Nielebock, 2020) and increasing work satisfaction (Bouncken, Ratzmann, Barwinski, & Kraus, 2020). Even more important, evidence has been found that ascribes the community a critical role in deciding

to stay in or leave a coworking-space (Garrett et al., 2017), and nascent coworkers highly profit from more experienced members that may act similar to mentors (Bouncken & Aslam, 2019). On the other hand, research also emphasizes that coworking-space are fragile business models (Seo, Lysiankova, Ock, & Chun, 2017). As such, providers need to understand their coworkers' needs and demands and offer a portfolio of adequate solutions, such as creating a creative and supportive environment, reinforced by infrastructure and events (e.g., workshops) (Blagoev, Costas, & Kärreman, 2019; Garrett et al., 2017). One of the main challenges, therefore, is understanding, inducing, and managing social interaction among coworkers.

For this undertaking, a holistic perspective, including both physical and digital amenities as well as coworkers' perception of these, is deemed necessary to investigate coworking-related phenomena. As digital applications are an inevitable component of a coworking-space (Bouncken, Laudien, Fredrich, & Görmar, 2018), these software tools need to be included in coworking-space' design, amelioration, and management. Recent findings have shown that coworking-spaces are environments of Co-Prosumption, i.e., co-located coworkers cocreate value with the coworking-space provider in the same service space (Bouncken & Tiberius, 2021). Hence, the software infrastructure also influences value co-creation and, ultimately, impacts the coworking-space' service space manifestation: coworkers may coordinate cocreation among themselves, which may be affected by technology, work on their own, or combine both (Bouncken & Tiberius, 2021; Spinuzzi, 2012; Spinuzzi, Bodrožić, Scaratti, & Ivaldi, 2019). An example of software-based coordination lies in so-called innovation management software, which is used in companies and ecosystems to emphasize the aspects of innovation management in the innovation process (e.g., Huesig & Endres, 2018; Endres, Huesig, & Pesch, 2022). Contrary to companies, professionals in coworking-space first need to find each other to use appropriate software for better coordination.

Previous research has outlined the concept of so-called matchmaking tools, which are software applications meant to facilitate social connections and, as such, elicit serendipity, creativity, and innovation (Kopplin, 2021). Matchmaking tools offer a platform that serves as an intermediary between physical and digital, i.e., online and offline, activities within the coworking-space and increases the number of possible business opportunities and the probability of encountering serendipitous situations, which some authors have proposed the

main principle of coworking-spaces (Moriset, 2013). For example, they may link individuals from different backgrounds who may profit from a de-contextualization, i.e., an idea's transfer from one realm to another (Bouncken & Aslam, 2019), which in essence is a coordination problem. Through their algorithmic nature, in contrast to more or less casual, free-of-constraints face-to-face encounters, they may take the problem of pre-discoveries into account. This term refers to serendipitous insights that cannot be exploited as they are not recognized due to a lack of knowledge or skill (Merton & Barber, 2007). By creating digital profiles that may be specified with rich data on professional experience, personal interest, and existing knowledge, matchmaking tools can introduce coworkers who are likely to benefit from the encounter.

For the applications to manifest their benefits, it is critical that coworkers make use of them. Thus, their technology acceptance needs to be ensured. First insights into coworkers' acceptance of matchmaking tools have been presented by Kopplin (2021), with a focus on match-making tool's conceptual layout and their utilitarian benefits. To understand the prospects and the role of these applications, it is necessary to integrate them within a broader nomological net extending the utilitarian view, which considers hedonic factors as well as coworking-space-specific con-textual influences such as the availability of "offline" activities such as workshops, breakfasts, and pitch sessions, which are common elements of coworking (Blagoev et al., 2019). Thus far, little research has investigated the acceptance of matchmaking tools in coworking-spaces.

In a nutshell, the extant work on matchmaking tools is somewhat theoretical and needs empirical amplification. Besides the study by Kopplin (2021), insights are scarce. The purpose of this study is to advance our understanding of these applications in two substantial ways: first, additional empirical evidence for the impact of utilitarian aspects is provided, and the research perspective is extended to further include hedonic and context-dependent variables, namely sense of community and coworkers' satisfaction with offline activities. Second, the influence of user perceptions on technology acceptance is assessed from sufficiency and necessity angles, thus presenting 'both sides of the coin'. In total, we provide a contextualized and methodologically holistic view of coworkers' acceptance of matchmaking tools. Thus, our research questions are as follows:

Research question 1: Which influence factors drive coworkers' acceptance of matchmaking tools?

Research question 2: What is the nature of this influence in terms of necessity and sufficiency?

Based on a UTAUT2 framework, an adapted model is derived and tested using partial least squares structural equation modeling (PLS-SEM), complemented by a necessary condition analysis (NCA) (Dul, 2016). Our study contributes to the coworking-space literature by identifying the structure and impact of coworkers' perception of matchmaking tools on their intended usage behavior, providing insights into their goals when using such an application, and offering starting points for coworking-space providers' deliberate design of the coworking-space' technological infrastructure. By contextualizing a UTAUT2-based model, we also contribute to the technology acceptance literature as we demonstrate the implementation of variables capturing the social surrounding as well as alternatives that may serve the same purposes as the technology under investigation.

The remainder of the paper is structured as follows. Section 6.3 outlines the related work and sheds light on the theoretical underpinnings. The research design is presented in Section 6.4, followed by the results in Section 6.5, and a discussion in Section 6.6. The final section gives concluding remarks and provides an outlook for future research.

6.3 THEORETICAL BACKGROUND

6.3.1 Role and Acceptance of Technology in Coworking-spaces

Coworking-spaces have mushroomed worldwide and sparked a rich body of scientific studies from a broad range of disciplines. As out-of-the-box workplaces, they offer a mixture of basic infrastructure, such as Internet access, and various amenities like workshops (Spinuzzi, 2012). Coworking-spaces are membership-based innovation hubs for cross-fertilization, inspiration, and professional exchange, and economic environments that provide essential infrastructure for daily business (Bouncken & Reuschl, 2018; Garrett et al., 2017; Gerdenitsch et al., 2016). Individuals as well as start-up companies and employees of large corporations work alongside each other and utilize the same physical and digital amenities (Bianchi, Casnici, & Squazzoni, 2018), which may comprise basic technology such as WiFi access, but also social events in the form of pitch sessions, workshops, and the like (Blagoev et al., 2019; Garrett et al., 2017). Within this environment, coworkers have personal goods (e.g., a mailbox or a messaging inbox) and collective goods (e.g., mutually used lounge areas, phone booths) at their disposal (DeGuzman & Tang, 2011). In short,

coworking-spaces may be described as surroundings of sociomateriality (Bouncken, Aslam, & Qiu, 2021; Orlikowski, 2007) that offer an out-of-the-box ecosystem.

This interplay between a community of like-minded people and supporting infrastructure renders interaction among coworkers a vital component of everyday coworking. The extant literature has found mixed evidence regarding coworking-space' community spirit, and the phrase 'working alone together' has been cited in many publications (coined by Spinuzzi, 2012; see also the discussion of the term community in Spinuzzi et al., 2019). As Bouncken et al. (2021) summarize, coworking has not lived up to expectations so far and has brought disappointment on the sides of providers and coworkers. It appears that mere spatial proximity is not sufficient for beneficial interaction; instead, cognitive proximity needs to be created (Bouncken & Aslam, 2019; Kopplin, 2021). As one remedy, digital tools for information dissemination and supporting coworkers find complementary resources, such as a business partner, have been proposed (Bouncken et al., 2021). The study at hand hence investigates drivers of coworkers' technology acceptance of matchmaking tools to understand drivers and barriers of their use and advances our current knowledge by integrating hedonic as well as environmental factors in terms of coworkers' sense of community and the availability of potentially competitive 'offline' activities such as pitch sessions and workshops. In this vein, we adapt the extant knowledge about technology acceptance to reflect coworking's characteristics and provide a coworking-specific conceptual framework. Further, we provide empirical data on coworkers' evaluation of potential uses regarding matchmaking tools in their daily routine. For coworking-space providers to successfully implement such an application, it is critical to understand coworkers' perceptions and evaluations of this type of software.

6.3.2 Utilitarian Beliefs

Due to their embedding in the sharing economy (Bouncken et al., 2020; Gandini, 2015), coworking-space are characterized by the idea of an interactive environment that enables collaboration (Schmidt & Brinks, 2017). This sharing focus is enabled by the omnipresence and availability of digitalized tools, making it feasible to connect supply and demand anytime and anywhere, and, thus, it emphasizes the role of access to resources instead of owning them (Belk, 2014). Recent research indicates that collaborative efforts, such as knowledge sharing, increase coworkers' creative performance, which is frequently viewed as a major benefit of coworking-space (Bouncken & Aslam, 2019; Parrino, 2015; Rese et

al., 2020). Indeed, a thrive to learn has been proposed as the defining quality of coworking (Bouncken & Aslam, 2019; Waters-Lynch & Potts, 2017). Seo et al. (2017) add that coworking-space provide an essential realm for exchange and gaining experience, which is of particular help in regions with high numbers of one-person companies and start-ups. This functionality of providing a junction, serving as a beacon for those who need it, appears vastly similar to the Schelling Point notion mentioned by Waters-Lynch and Potts (2017). In essence, coworking-space may be described as loci for conjointly venturing, which implies coordination requirements among coworkers.

Within a typical coworking-space, several mechanisms are in place to facilitate socially connecting for inspiration and innovation. Common elements comprise digital member directories, newsletters, and social events, but also community hosts, and digital interfaces between the digital and physical realm such as matchmaking tools (Kopplin, 2021; Waters-Lynch & Potts, 2017). Coworkers, of course, need to be aware of these amenities to be able to benefit from them. Such learning opportunities that have been institutionalized “support the combination and recombination of knowledge” (Bouncken & Aslam, 2019), and, consequently, are valuable assets for both coworkers and coworking-space providers. Focusing on mere co-location for collaboration can be misleading (Spinuzzi, 2012), as instead, the interplay of “social actors and material artifacts” (Bouncken & Aslam, 2019) needs to be considered. Any solution that seeks acceptance thus needs to bear an advantage regarding identifying and approaching helpful others, i.e., coworkers will evaluate whether it is reasonable to assume “the existence of a use-performance relationship” (Agarwal & Karahanna, 2000). As coworking-space are spheres where the online and the offline realms mix, and coworkers may ask around for help in person, use a bulletin board, or ask the community host for information, it is assumed that rational decision-makers will also evaluate whether the usage of a matchmaking tool is low in effort. Hence, we derive the following hypotheses:

Proposition 1: *Performance expectancy (PE) has a positive impact on coworkers’ behavioral intention to use a matchmaking tool.*

Proposition 2: *Effort expectancy (EE) has a positive impact on coworkers’ behavioral intention to use a matchmaking tool.*

6.3.3 Hedonic Beliefs and Personal Innovativeness

Recent years have witnessed the implementation of technologies previously known from consumer settings in the professional context. This phenomenon has been termed consumerization and proposes to view individuals as consumers, regardless of whether they are in an actual demand situation or on the supply side (Harris, Ives, & Junglas, 2012). We believe that consumerization adequately represents the entanglement of coworkers within a coworking-space, and, particularly in the case of matchmaking tools, it is likely that most coworkers have experiences with similar applications from their private contexts. For example, Tinder may be a prominent specimen of matchmaking tools in the realm of romantic relationships.

Further, including private settings into the professional context, renders coworkers' behavioral beliefs about receiving hedonic benefits an essential factor (Venkatesh, Thong, & Xu, 2012). This integration is also consistent with the notion of dual-purpose information systems, i.e., applications that fulfill both utilitarian and hedonic needs, and of which communication-related tools are a prominent example (Wu & Lu, 2013). Thus, we hypothesize:

Proposition 3: *Hedonic motivation has a positive impact on coworkers' behavioral intention to use a matchmaking tool.*

Extant research has further proposed to include the concept of personal innovativeness (PI; Kopplin, 2021). As coworking-spaces yield an innovative, creative, and inspirational nature, coworkers may feel attracted to novel tools that incorporate a progressive and forward-looking quality. PI has been introduced to the literature to explain why some individuals are willing to employ a new technology while others are not, and has a long history in research on innovation diffusion but also marketing (Agarwal & Prasad, 1998). In the literature on the diffusion of innovations, notions of consumers being located on a continuum from innovative to not innovative serve as anchor points for segmentation based on the time of particular individuals' adoption (Rogers & Shoemaker, 1971). This conceptualization has not been without criticism (see, e.g., Midgley & Dowling, 1978), and more specific definitions distinguishing between global and domain-specific innovativeness have been proposed (Flynn & Goldsmith, 1993). Consistent with this distinction, Agarwal and Prasad (1998) develop the concept of PI in the domain of information technology and view it as an essential moderator for technology acceptance measurement. However, this specification

has led to mixed results, and Agarwal and Karahanna (2000) proposed a new construct termed cognitive absorption as an antecedent of TAM-based variables (i.e., perceived usefulness and perceived ease of use), which in turn is influenced by PI and playfulness. Here, a first shift from a moderating role towards an antecedent could be observed.

Complementary research shows that it may be adequately used as a factor of behavioral intention; however, it is mediated by TAM-related constructs such as perceived usefulness and perceived ease of use (Jackson, Voth, & Frey, 2013; Lu, Yao, & Yu, 2005), corroborating the work by Agarwal and Karahanna (2000). For example, Lu et al. (2005) argue that predominant technology acceptance models are commonly used after adoption, and, as such, they are more related to continuous use than to acceptance. They conclude that for the pre-adoption context, “holistic experiences with technology as captured in constructs such as enjoyment, flow, and social image are potentially important explanatory variables in technology acceptance” (Lu et al., 2005). During this initial phase of adoption, “decision-making is exposed to variables other than those incurred by the technology itself” (Lu et al., 2005). We need to understand how beliefs about a technology’s properties are created (Agarwal & Karahanna, 2000). Besides perceived relevance (PR), PI is included for this purpose. Consequently, we derive:

Proposition 4a: *Personal innovativeness has a positive impact on coworkers’ behavioral intention to use a matchmaking tool.*

Proposition 4b: *Personal innovativeness has a positive impact on hedonic motivation.*

6.3.4 Perceived relevance

The extant literature mentions that coworkers may follow different goals and behavioral patterns during their visits. In the terminology provided by Bouncken et al. (2020), they may be classified as utilizers (i.e., they focus on the infrastructure), socializers (i.e., social acknowledgment is emphasized), and learners (i.e., knowledge acquisition is the main motive). To incorporate this heterogeneity in our model, we propose that not only the perception that a match-making tool will support social interactions will have an impact, but also coworkers’ belief that such tools’ capabilities match their own goals. For example, a socializer may prefer attending events in person rather than assessing member profiles on her smartphone, i.e., a matchmaking tool’s PR may be low. PR has been studied in a variety of contexts such as online advertising (Campbell & Wright, 2008; Jung, 2017), Internet use

for information seeking (Shih, 2004), media usage in education (Hu, Clark, & Ma, 2003), and technology acceptance in general (Bhattacharjee and Sanford 2006), and describes individuals' impression of goal congruency, i.e., the object under investigation is "related to personal needs and values" (Jung, 2017) and "instrumental in achieving their personal goals" (Celsi & Olson, 1988). Extant research shows that PR has a positive influence on attitude, which is established by beliefs about the likely outcomes of a certain behavior (Celsi & Olson, 1988; Fishbein & Ajzen, 1975; Madden, Ellen, & Ajzen, 1992). Consequently, PR is expected to impact the perception of technology's performance capabilities positively.

When a coworker observes a high degree of congruency between personal goals and the match-making tools' capabilities, it is also assumed that the effort that is necessary to make use of the tool is viewed in a positive light, as a sort of investment that helps to take the next steps towards one's goal. Indeed, evidence has been found that notions of usefulness and ease of use are influenced by PR (Shih, 2004). Further, depending on the individual coworker's goals, the entertaining, i.e., hedonic component of the application, may be the vital reason for usage. We thus hypothesize:

Proposition 5a: *Perceived relevance has a positive impact on performance expectancy.*

Proposition 5b: *Perceived relevance has a positive impact on effort expectancy.*

Proposition 5c: *Perceived relevance has a positive impact on hedonic motivation.*

6.3.5 Community and social interaction

The final set of hypotheses includes coworkers' sense of community and their interactions in the physical rather than the digital realm. These context factors are critical to understanding the role of matchmaking tools in coworking-spaces, as, for example, a particular coworker's goals may be entirely achievable through personal communication, rendering a software application for the same purpose irrelevant. A coworking-space' community may be viewed as consisting of distinct economic entities – which may be individual freelancers, start-up teams, and other actors such as employees from incumbent organizations – and consequently, there is commonly no shared economic agenda (Bianchi et al., 2018; Garrett et al., 2017). Hence, initiating a collaboration is unsolicited.

In this regard, it is important to keep in mind that coworking-space are not only practical, utility-focused environments but organizational phenomena (Blagoev et al., 2019), and the notion of community is central to these places (Bouncken et al., 2020; Garrett et al., 2017;

Gerdenitsch et al., 2016; Spinuzzi et al., 2019). In contrast to a „neutral container“ (Blagoev et al., 2019), coworking-spaces provide opportunities for networking and identification (Capdevila, 2013). As Waters-Lynch and Potts (2017) mention, coworkers frequently do not seek traditional office standards but pay their membership for entering a space that solves the coordination problem of ‘who needs to be met’. Against the backdrop of a matchmaking tool’s capabilities, the concept of a coordination problem is a valuable theoretical lens. In line with Waters-Lynch and Potts (2017), we deem community and coordination not mutually exclusive perspectives on coworking but complements that provide a partial understanding each. Exchange is contingent upon social factors such as trust and the perceived absence of opportunity (Bouncken & Reuschl, 2018; Rese et al., 2020; Spinuzzi et al., 2019). Consequently, a favorable assessment of a coworking-space’ social sphere should positively affect coworkers’ perception of a matchmaking tool.

We use two constructs to capture the interplay of personal and digital interaction in coworking-spaces: sense of community and satisfaction with offline activities. Both constructs are assumed to mirror the social sphere of the coworking-space. The open layout and architecture has been mentioned as a facilitator for social interaction (Bilandzic & Foth, 2013), and, as such, a certain degree of rivalry between online and offline activities may be expected.

We, therefore, hypothesize:

Proposition 6a: *Sense of community positively moderates the impact of performance expectancy on coworkers’ behavioral intention to use a matchmaking tool.*

Proposition 6b: *Sense of community positively moderates the impact of effort expectancy on coworkers’ behavioral intention to use a matchmaking tool.*

Proposition 6c: *Sense of community positively moderates the impact of hedonic motivation on coworkers’ behavioral intention to use a matchmaking tool.*

Considering the role of offline activities, we expect a moderating influence on PR’s impact. PR, capturing the perception of congruency between the individual demands and the technology’s capabilities, should be unaffected by the availability of alternatives, as this congruency is an absolute rather than a relative assessment and is not context-dependent. Thus, we conclude that satisfaction with offline activities should not be a factor of PR. The PR of the tool itself should not be altered by the mere presence of alternatives. Instead, it is

expected that satisfaction with these alternatives will attenuate, i.e., negatively moderate, the impact that PR has on the coworker’s perceptions of PE and EE: the more satisfied the individual coworker is regarding alternatives, the less substantial they may feel to use the tool due to a high degree of congruency between the application’s capabilities and their job’s demands, as alternatives may provide more attractive benefits (e.g., they may exhibit an even more substantial congruency). In other words, it is expected that the criticality of a goal congruency is diminished when other opportunities are available that may also help to achieve a certain goal. This leads to the following hypotheses:

Proposition 7a: *Satisfaction with offline activities negatively moderates the impact of perceived relevance on performance expectancy.*

Proposition 7b: *Satisfaction with offline activities negatively moderates the impact of perceived relevance on effort expectancy.*

Figure 7 displays the final research model.

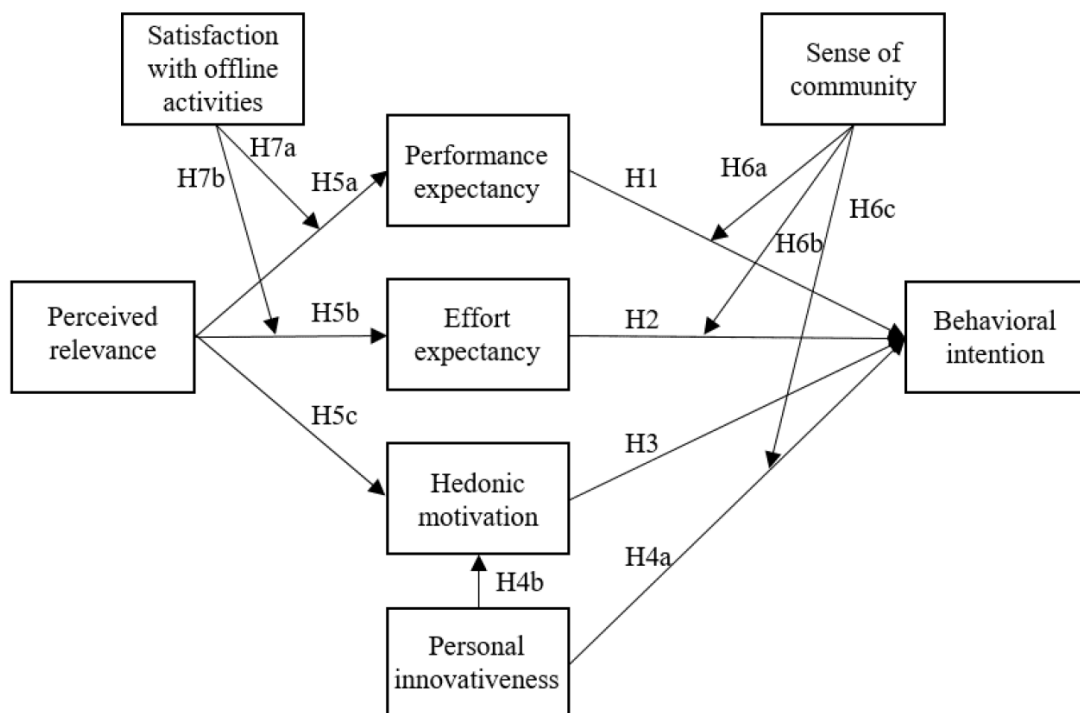


Figure 8: *Research model and hypotheses*

6.4 RESEARCH DESIGN

6.4.1 Constructs and Items

We adopted established measures from the literature. The items for the ‘core model’, i.e., PE, EE, and HM postulated to impact BI, are taken from the UTAUT2 framework (Venkatesh et al., 2012). PI is operationalized drawing on the indicators suggested by Agarwal and Prasad (1998). For PR, we adopted the construct from Alalwan (2018). SOA is measured with items from Liaw (2008) and Arbaugh (2000). Finally, we used the scale proposed by Peterson, Speer, and McMillan (2008) for SOC. A complete list is provided in Table 28 (Appendix).

To contextualize our model, we modified the framework of UTAUT2 (Venkatesh, Thong, & Xu, 2016). Compared to the original model, we omitted the variables social influence, facilitating conditions, habit, and price value (Venkatesh et al., 2012). Price value was dropped as currently introduced matchmaking tools are part of the coworking-space’ infrastructure (Kopplin, 2021) and do not require the payment of an additional fee. As such, this consideration would not reflect the actual situation within the coworking-space. Habit is a construct with an extensive literature stream and is discussed widely and inconsistently in the technology acceptance literature. Some scholars propose technology use models driven by habit as an automatism (De Guinea & Markus, 2009; Jaspersen, Carter, & Zmud, 2005; Limayem, Hirt, & Cheung, 2007). In the context of a novel technology, which applies to the study at hand, it appears inadequate to include habit, as many coworkers are expected to lack experience with these tools. Social influence, essentially capturing a form of peer pressure (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh et al., 2012), was swapped for the more detailed sense of community. We admit that the two variables are distinct; however, it is deemed more context relevant to include the particular notion of a sense of community. It is also expected that this sense is related to coworkers’ belief of being able to find help and resources, conflicting with facilitating conditions (Venkatesh et al., 2012). Thus, these two UTAUT2 variables were removed from the final research model.

6.4.2 Questionnaire Design

The questionnaire was drafted using Qualtrics. All constructs were measured on a five-point Likert-type scale, ranging from ‘I completely disagree’ (i.e., 1) to ‘I completely agree’ (i.e., 5). To prevent common method bias, participants were instructed that there were no incorrect

answers, and the collected data will be handled confidentially. As an incentive to complete the survey, respondents had the opportunity to participate in a lottery and had the chance to win gift cards (25 Euros of value) for a large online shopping platform. All items were adopted from the literature, as there was no need to draft new variables.

6.4.3 Sampling Strategy

German coworking-spaces were targeted for sampling. Due to the different types of coworking-space emerging over time (Blagoev et al., 2019), it is worthwhile to address which kind of spaces we targeted briefly. In the terminology provided by Bouncken et al. (2018), our population may be classified as independent coworking-spaces. We did not include incumbent organizations that designed offices for their employees in the architecture of coworking-spaces, and we also excluded highly specialized hubs as we believe these would introduce a vast amount of heterogeneity due to potential (harmful) competition among the coworkers. Independent coworking-spaces, in contrast, are expected to yield co-competition, i.e., a duality of collaboration and competition, which is linked to innovation potential (Bouncken et al., 2018).

Using websites for desk booking, blogs, newspaper reports, and complementary search engine queries, an exhaustive list of 500 coworking-space located in Germany was compiled. Employing a cluster sampling approach, 340 coworking-spaces were selected from that list and contacted via telephone and a follow-up e-mail, including a link to the survey. Each sampled coworking-space was asked to provide five completed questionnaires from coworkers.

6.5 RESULTS

6.5.1 Descriptive Statistics

In total, 182 questionnaires were received from 43 coworking-space, of which 101 were complete and considered for data assessment. This divergence may be partially explained regarding our sampling strategy: coworking-space managers were asked to spread the questionnaire, and they opened the survey to gain insights into its content before passing it on to the coworkers. Considering incomplete questionnaires that moved beyond the first three questions only (i.e., the first page yielding questions), we report a completion rate of 78.9 %. To ensure high data quality, the received questionnaires are checked for speeders and straightliners. Three data points had to be removed due to unlikely short response times,

and five more observations were deleted because of strong indication for straightliners (three showed extreme response behavior, and the remaining two selected indifferent answers for all questions). Another data point was classified as a slower (i.e., the opposite of a speeder), who had a response time exceeding 24 hours, and was removed. In total, 92 questionnaires qualified for analysis. Table 32 (Appendix) lists the coworking-space, their location, and the gathered responses. As can be seen, most questionnaires stem from major cities such as Berlin, Munich, Hamburg, and Dusseldorf.

Regarding age, our sample is consistent with earlier reports on coworkers, with a mean age of 34.63 years (median = 33) and a standard deviation of 7.79. The female-to-male ratio was balanced, with 47.4 % women and 52.6 % men. In line with the extant literature, which noticed a shift from freelancers towards employees, only 14.7 % reported they worked as freelancers, while 52.6 % were employees. About a sixth (16.8 %) was entrepreneurs and 10.5 % employers. Concerning industries, most respondents are rooted in the IT field (28.4 %), followed by consulting (17.9 %), management (11.6 %), and marketing (8.4 %).

We also collected data about the coworking-space' social spheres. Table 20 provides an overview of coworker and coworking-space characteristics. The largest proportion of coworkers visits the space five times a week, followed by a group coming in four days. Predominant coworking-space sizes in terms of members were small (less than ten members) and medium (11 to 30 members). Membership type varied, with similar proportions of coworkers renting hot desks, fixed desks, and individual rooms. A small fraction (4.2 %) indicated other modes of use, such as a mixture of fixed desks and rooms. Regarding accessibility, most coworking-space allow 24/7 coworking (73.7 %), while some have regular office hours (20.0 %). A minority of spaces yields other access modes, such as distinguishing workdays from weekends and providing different office hours (6.3 %). Asked for offline activities, i.e., social events such as breakfasts, workshops, and pitch sessions, 76.8 % responded their coworking-space offers this type of amenity. 10.5 % refused, while 12.6 % indicated that they did not know. Consequently, matchmaking tools may be assumed to be deployed in an environment requiring integrating both the digital and the analog realm. Consistent with previous research, matchmaking tools are considered relatively new technology and most coworkers have not used such an application before (95.8 %). After being introduced to the state-of-the-art and typical features, as described in Kopplin (2021), we asked the participants to assess possible use scenarios of the tool. Two-thirds (64.2 %)

responded they would seek to get in touch with fellow coworkers, and 62.1 % would look for support with current challenges. About half of the participants (51.6 %) mentioned finding learning opportunities, and 44.2 % would search collaboration partners for a project idea. Coworkers also stated more business-related applications: identifying new customers (46.3 %), expanding their professional network (67.4 %), and finding partners for the incorporation of an enterprise (7.4 %). Altogether, most coworkers identified as either socializers or utilizers instead of learners; however, the majority still emphasizes matchmaking tools' potential for identifying learning opportunities.

Characteristic	Response frequency
Visit frequency	
Five days a week	31.6 %
Four days a week	16.8 %
Three days a week	14.7 %
Twice a week	11.6 %
Once a week	8.4 %
Less frequent than once a week	10.5 %
CWS size	
Less than 10 coworkers	35.8 %
11 to 30 coworkers	33.7 %
31 to 40 coworkers	20.9 %
More than 40 coworkers	9.6 %
Membership modality	
Hot desk	29.5 %
Fixed desk	30.5 %
Individual room	35.8 %
Other	4.2 %
CWS accessibility	
24/7	73.7 %
Office hours	20.0 %
Other	6.3 %
Membership duration	
More than one year	37.9 %
6 to 12 months	17.9 %
3 to 5 months	20.0 %
Less than 3 months	24.2 %
Future membership plans	
Stay for more than one year	60.0 %
Stay for 6 to 12 months	17.9 %
Stay for less than 6 months	22.1 %
Coworker typology	
Socializer	63.2 %
Utilizer	62.1 %
Learner	7.4 %

Table 20: Coworker and CWS characteristics.

6.5.2 Outer Model Evaluation

Two approaches are employed to evaluate potential common method bias, namely Harman's single-factor test (Podsakoff & Organ, 1986) and the full collinearity approach (Kock, 2015). Both assessments indicate an absence of common method bias. Confirmatory tetrad analysis (CTA-PLS) is used to check whether our specifications as reflective measures are appropriate (Gudergan, Ringle, Wende, & Will, 2008). For all constructs, the reflective model could be confirmed.

To test the model's factor structure, a confirmatory composite analysis is conducted (Hair Jr, Howard, & Nitzl, 2020; Schuberth, Henseler, & Dijkstra, 2018; Schuberth, 2021). SmartPLS 3.3.2 is used for calculation (Ringle, Wende, & Becker, 2015). The PLS algorithm is set to a maximum of 300 iterations, a stop criterion of 10^{-7} , and a path weighting scheme. The covariance matrix is provided in Appendix B. All indicators' outer loadings should exceed a threshold of 0.708 (Hair, Risher, Sarstedt, & Ringle, 2019), which is the case for all manifest variables except for PI3, SOA3, and SOC4. Construct validity and reliability are checked, drawing on composite reliability (CR) and the average variance extracted (AVE). For all constructs, the thresholds of 0.70 for CR and of 0.50 for AVE are met (Hair et al., 2019). Hence, we decided to retain PI3, SOA3, and SOC4 (see, e.g., Hair, Hult, Ringle, & Sarstedt, 2016). Table 21 displays the assessment of our constructs.

	Indicators	Mean (SD)	Cronbach's Alpha	Composite Reliability	AVE
PE	4	4.49 (1.24)	0.931	0.951	0.828
EE	4	5.39 (0.92)	0.834	0.889	0.666
HM	3	4.85 (1.08)	0.865	0.916	0.785
PI	4	4.91 (1.22)	0.820	0.877	0.648
BI	4	4.49 (1.23)	0.899	0.930	0.770
PR	4	4.41 (1.40)	0.942	0.959	0.853
SOC	4	5.31 (1.22)	0.877	0.899	0.695
SOA	3	5.27 (0.89)	0.754	0.840	0.641

Table 21: Construct assessment.

Discriminant validity is checked using an examination of cross-loadings, the Fornell-Larcker criterion, and the heterotrait-monotrait ratio (HTMT) (Henseler, Ringle, & Sarstedt, 2015). The HTMT ratios are provided in able 22; evaluations of the Fornell-Larcker criterion and cross-loadings are displayed in Appendices C and D. As can be observed, HTMT ratios are within the recommended range below 0.85 for all pairs except for PR-BI, which yields a value of 0.859. Albeit above the conservative threshold, the literature suggests a second,

more liberal anchor of 0.90 (Henseler et al., 2015). A bootstrapping procedure using 10,000 draws further corroborates discriminant validity, showing that all 95 and 99 percent confidence intervals' upper borders are far off the null value of 1 (Henseler et al., 2015). Discriminant validity could be established, and hence, the assessment of the outer model is complete.

	PE	EE	HM	PI	PR	BI	SOC	SOA
PE								
EE	0.419							
HM	0.658	0.566						
PI	0.173	0.355	0.273					
PR	0.798	0.464	0.789	0.250				
BI	0.770	0.493	0.738	0.363	0.859			
SOC	0.064	0.102	0.119	0.213	0.118	0.112		
SOA	0.091	0.132	0.098	0.350	0.090	0.083	0.401	

Table 22: HTMT ratios.

6.5.3 Inner Model Evaluation

The evaluation of the inner model begins with a check for potential collinearity problems. Variance inflation factors (VIFs) are employed for this purpose, with values below 3 indicating an absence of collinearity issues (Hair et al., 2019). The highest VIF is 1.940, and consequently, we assume that collinearity is not a threat to our model. In the next step, the coefficient of determination (R^2) is used to assess the model's explanatory power. The highest value was calculated for BI ($R^2 = 0.731$), followed by PE ($R^2 = 0.562$). HM could be explained with a similar fit ($R^2 = 0.545$). For EE, the explanatory power was reasonably low, yielding an R^2 of 0.183. Through blindfolding, Q^2 values were derived. All values are greater than zero and indicate relevance (Hair et al., 2019), yielding values of 0.509 for BI, 0.449 for PE, 0.090 for EE, and 0.403 for HM. In the cases of BI, PE, and HM, their respective predictors appear adequate and relevant; however, for EE, the Q^2 value is relatively low. Table 23 displays a summarization.

Construct	R^2 value	R^2 adjusted	Interpretation	Q^2 value	Interpretation
PE	0.562	0.557	Moderate	0.449	Medium to large relevance
EE	0.183	0.174	Weak	0.090	Small relevance
HM	0.545	0.535	Moderate	0.403	Medium to large relevance
BI	0.731	0.705	Substantial	0.509	Large relevance

Table 23: Explanatory power. Interpretation adopted from Hair et al. (2019).

For hypotheses testing, we employ a bootstrapping procedure using 10,000 draws. We evaluate the path relations drawing on path coefficients and f^2 measures and interpret 95 percent confidence intervals as compatibility intervals, i.e., a span of values that are compatible with our empirical data. Table 24 summarizes the results.

Hypothesis				Path coefficient (f^2 value)	95 percent confidence interval (BCa)	T-value (p-value)
H1	PE	→	BI	0.503 (0.521)	[0.323, 0.642]	5.999 (< 0.001)
H2	EE	→	BI	0.001 (< 0.001)	[-0.162, 0.106]	0.018 (0.986)
H3	HM	→	BI	0.273 (0.143)	[0.113, 0.453]	2.889 (0.004)
H4a	PI	→	BI	0.173 (0.090)	[0.011, 0.319]	2.436 (0.015)
H4b	PI	→	HM	0.087 (0.016)	[-0.089, 0.240]	1.059 (0.290)
H5a	PR	→	PE	0.749 (1.321)	[0.652, 0.837]	15.746 (< 0.001)
H5b	PR	→	EE	0.424 (0.229)	[0.240, 0.577]	4.614 (< 0.001)
H5c	PR	→	HM	0.712 (1.046)	[0.608, 0.802]	14.509 (< 0.001)
H6a	SOC	→	PE → BI	0.281 (0.224)	[0.160, 0.438]	2.430 (0.015)
H6b	SOC	→	EE → BI	-0.166 (0.072)	[-0.381, 0.045]	1.035 (0.301)
H6c	SOC	→	HM → BI	-0.250 (0.187)	[-0.394, -0.032]	2.280 (0.023)
H7a	SOA	→	PR → PE	-0.113 (0.026)	[-0.279, 0.325]	0.585 (0.559)
H7b	SOA	→	PR → EE	-0.157 (0.024)	[-0.276, 0.443]	0.738 (0.461)

Table 24: Hypotheses testing.

As Table 24 displays, most hypotheses could be corroborated. No evidence was found for EE's impact on BI, and three moderating effects: SOC did not statistically significantly influence the EE-BI relation, and the impact of SOA on PR-PE and PR-EE was also not striking. Regarding the research model's dual-purpose core, PE yielded a large effect on BI ($f^2 = 0.521$), followed by HM with a medium influence ($f^2 = 0.143$). PI exhibited a small but significant impact on BI.

Considering the formation of PE, EE, and HM, PR was found to be a substantial influence with a very large impact on PE ($f^2 = 1.321$), a medium effect on EE ($f^2 = 0.229$), and another large influence on HM ($f^2 = 1.046$). The remaining moderator relations, SOC's influence on the PE-BI and the HM-BI link, were both found to exhibit medium effects ($f^2 = 0.224$ and 0.187 , respectively). However, the direction of the moderating effect on the HM-BI relation contradicts our hypothesis, yielding a negative sign. Consequently, the larger coworkers' sense of community is, the smaller the impact of HM on their intention to use the matchmaking tool. Figure 8 presents a succinct summary of our findings.

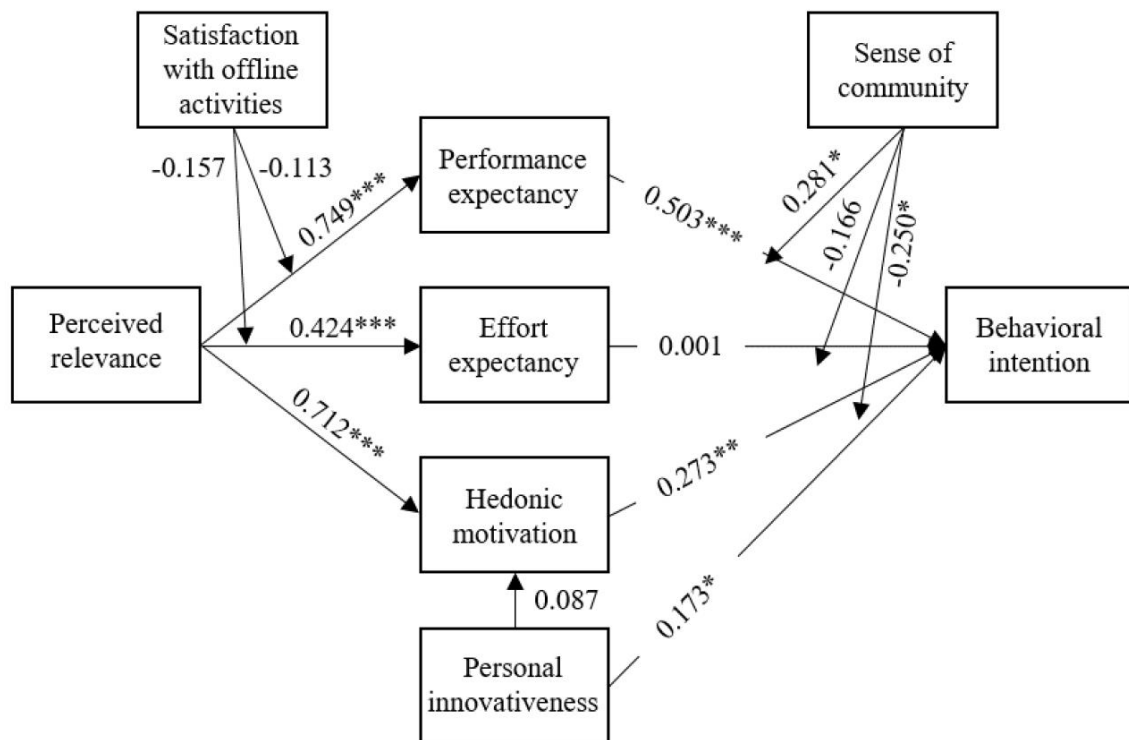


Figure 9: PLS results.

Note: Values indicate path coefficients; *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$.

6.5.4 Necessary Condition Analysis

Following the recommendations by Richter, Schubring, Hauff, Ringle, and Sarstedt (2020), a necessary condition analysis (NCA) (Dul, 2016). Latent variable scores are exported from the PLS model and used as input. In contrast to other approaches such as fsQCA (Ragin, 2009), which allow an examination of necessity *in kind* (i.e., yes or no), NCA provides further insights into each condition's *degree* of constraint that is imposed on the outcome (Dul, 2016). Consequently, PLS and NCA may be used as complementary analyses: while PLS ensures the validity and reliability of the measurement model and gives information about each variable's sufficiency in terms of path coefficients, NCA reveals potential necessity qualities that need to be considered when deriving theoretical or practical implications (Richter et al., 2020).

To perform NCA, XY plots containing the data points are drawn for each condition-outcome combination (with the condition on the horizontal and the outcome on the vertical axis), and a ceiling line is drawn above the scatterplot (Dul, 2016). The area atop, i.e., the ceiling zone, is an empty sector that describes values of the outcome that are constrained by the condition. The larger this zone is, the more substantial the effect of the necessary condition (Dul, 2016).

For the study at hand, we use ceiling regression – free disposal hull (CR-FDH). Our outcome of interest is BI, and our conditions are the variables from our research model that yield a direct impact: PE, EE, HM, and PI. To assess the NCA results for their statistical significance, we carried out a bootstrapping procedure with 10,000 draws. The results are presented in Table 25.

Condition	Observations	Accuracy	p-accuracy	Effect size d	p-value
PE	4	95.7 %	< 0.001	0.230	< 0.001
EE	2	97.8 %	< 0.001	0.349	< 0.001
HM	3	96.7 %	< 0.001	0.274	< 0.001
PI	4	95.7 %	0.006	0.133	0.112

Table 25: NCA Results

Note: The observations column indicates the number of cases located above the ceiling line.

To gain more detailed insights, the results can be presented using the bottleneck technique (Dul, 2016), which is displayed in Table 26. As can be observed, all four conditions are necessary and impose moderate to reasonably strong constraints on the outcome. PI yields the weakest restrictions and becomes only necessary for high values of BI; still, to allow the full range of BI to unfold, the requirements of PI quickly increase to about a third (36.6 %) and a half (46.6 %), respectively. HM is the second-to-last condition; however, note that all constraints become rather strict for high outcome values. For relatively moderate BI values (i.e., around 50 %), about a third of HM needs to be in place. PE plays an even more substantial role, rising to 60.2 % for the full range of BI. Finally, EE is the condition sticking out the most, requiring half of its range for moderate to high values of BI and increasing to two-thirds and three-quarters to allow BI to unfold in its entirety.

In the last step of our analysis, we combine the results from PLS-SEM (i.e., information about each variable's sufficiency) and NCA (i.e., information about each variable's necessity). Table 27 summarizes our findings. We also included the three remaining calculations for H4b, H5a, H5b, and H5c; however, these are not the focus of our analysis. Overall, the fruitfulness of combining PLS-SEM and NCA could be proven. For example, a focus on PLS-SEM would have resulted in EE being treated as irrelevant; however, this conclusion is only valid in terms of a sufficient condition. Our NCA reveals that EE is indeed a necessary condition and yields a large effect on BI.

Y	EE	HM	PE	PI
0	NN	NN	NN	NN
10	0.3	3.0	NN	NN
20	8.8	9.1	NN	NN
30	17.4	15.2	5.0	NN
40	26.0	21.3	12.9	NN
50	34.5	27.4	20.7	NN
60	43.1	33.4	28.6	6.4
70	51.7	39.5	36.5	16.5
80	60.2	45.6	44.4	26.5
90	68.8	51.7	52.3	36.6
100	77.4	57.8	60.2	46.6

Table 26: Bottleneck table.

Note: Y denotes the outcome, i.e., the occurrence of BI. All values in percent.

In total, all four predictors of BI (i.e., PE, EE, HM, and PI) were identified as being necessary *in degree* with varying constraints. Besides EE, the most substantial effect is imposed by HM, followed by PE and then PI. In terms of sufficiency, PE exhibits the most substantial effect on BI, while HM and PI play a subordinate role. EE does not yield any striking impact at all. SOA was found not to have a moderating influence. For SOC, two out of three postulated effects could be verified: it positively moderates the impact of PE on BI and has a negative effect on HM’s influence on BI. The role of PR is striking: the variable is necessary for PE and HM, yielding medium effects, and sufficient with large effects for PE and HM, and a medium effect for EE.

Hypothesis				Necessary condition	Sufficient condition
H1	PE	→	BI	Yes; medium effect (d = 0.230)	Yes; large effect (f ² = 0.521)
H2	EE	→	BI	Yes; large effect (d = 0.349)	No
H3	HM	→	BI	Yes; medium effect (d = 0.274)	Yes; medium effect (f ² = 0.143)
H4a	PI	→	BI	Yes; medium effect (d = 0.133)	Yes; small effect (f ² = 0.090)
H4b	PI	→	HM	No	Yes; small effect (f ² = 0.074)
H5a	PR	→	PE	Yes; medium effect (d = 0.251)	Yes; large effect (f ² = 1.321)
H5b	PR	→	EE	No	Yes; medium effect (f ² = 0.229)
H5c	PR	→	HM	Yes; medium effect (d = 0.235)	Yes; large effect (f ² = 1.046)
H6a	SOC	*	PE → BI	No	Yes; medium effect (f ² = 0.224)
H6b	SOC	*	EE → BI	No	No
H6c	SOC	*	HM → BI	No	Yes; medium effect (f ² = 0.187)
H7a	SOA	*	PR → PE	No	No
H7b	SOA	*	PR → EE	No	No

Table 27: Total result summary.

Note: Interpretation for effect size d adopted from Dul (2016b).

6.6 DISCUSSION

Consistent with the extant literature, coworkers' perception of utilitarian benefits was found to yield the most substantial impact on their intention to use a matchmaking tool in terms of sufficiency (Kopplin, 2021). Personal innovativeness, however, was also identified as an influential driver, which contrasts with these previous findings. The study at hand employed a UTAUT2-based framework, as opposed to TAM in the extant literature. Hence, a difference might occur due to the modifications of the structural model: as opposed to the TAM framework, where behavioral beliefs (except for perceived usefulness) only directly influence an individual's attitude towards using a particular technology, UTAUT2 postulates a direct linkage between technology acceptance factors and behavioral intention to use (Venkatesh et al., 2012). As our sample was also drawn from independent coworking-spaces, we believe that a systematic difference between both studies is rather unlikely.

Compared to the initial UTAUT2, we find an increased influence of PE (f^2 : 0.52 versus 0.21 in the original model)³ and a substantially decreased impact of EE (f^2 : < 0.01 versus 0.16). HM shows a similar slightly lower effect in our context (f^2 : 0.14 versus 0.23). Hence, we report a stronger focus on utilitarian aspects for matchmaking tools in coworking-spaces. The apparent difference regarding EE is striking at first; however, many studies find effort considerations to play only a minor role. Software applications both for computers and smartphones have been around for many years and rely on similar icons and interaction mechanisms, which might explain the finding for EE. At this point, it is important to bear in mind that PLS detects sufficient conditions. Our complementary NCA reveals that EE indeed yields a large effect and may be considered a necessary condition (Dul, 2016). Additionally, the variables PR and PI proved to exhibit an explanatory value for the context at hand. Moderator analyses showed that SOC is a significant determinant for technology acceptance in coworking-spaces, confirming our effort to contextualize our research model (Hong, Chan, Thong, Chasalow, & Dhillon, 2014). While SOC is a characteristic property of coworking-spaces (Garrett et al., 2017; Gerdenitsch et al., 2016) and thus, narrow in focus, both PI and PR may be readily employed in other contexts for an enhanced understanding of user perceptions of a particular technology, adding insights to the technology acceptance literature through cross-con-text applicability (Hong et al., 2014; Venkatesh et al., 2016).

From a necessity perspective, EE's large effect appears plausible for technology in general and matchmaking tools in particular. Coworking-space are designed to enable interaction

and communication, and coworkers may leave their desks and talk to others in person (Bouncken et al., 2020). Consequently, a tool imposing high effort is deemed unattractive. Besides, HM was identified as a necessary condition, consistent with the notion of dual-purpose information systems (see, e.g., Wu & Lu, 2013). PR shows reasonably mixed results: while the construct is a necessary condition for PE and HM and yields large effects in terms of sufficiency, it is not necessary for EE and only imposes a medium effect in the role of a sufficient condition. This divergence may be explained by the goal alternatives that coworkers may seek to achieve when using a matchmaking tool. Some will use the application as an efficient solution for contacting and, as such, perceive its utilitarian aspects as congruent with their goals. Others stress the hedonic component and consequently view this facet as goal-congruent. EE, in contrast to this dyad, is not a purpose itself but the effort required to utilize the application to achieve a purpose.

Our finding of offline activities (i.e., SOA) not impacting coworkers' perception of digital applications appears counterintuitive at first. We would have assumed that satisfying face-to-face communication opportunities render matchmaking tools irrelevant to at least some degree. Several factors may explain this result: first, daily work patterns may differ between individual coworkers, and hence some potentially helpful contacts may be simply not within the coworking-space at the current time. Second, it is unlikely to assume that all coworkers excel at networking, and a digital platform may facilitate contact compared to face-to-face interaction at a workshop or breakfast. For example, empirical evidence has been provided that for some coworkers, the potential of participating in a community is more important than actually becoming involved (Garrett et al., 2017), and this potential is tangible in the form of a matchmaking application. Third, it might also be the case that individuals consciously refrain from networking during community events such as lunch or parties, which may be perceived as less business-oriented than pitch sessions or exhibitions, in order not to shift the community's atmosphere from mutual coworking towards viewing each other as customers and business opportunities. Fourth, a matchmaking application allows assessing many profiles at a glance, providing a workflow very different from face-to-face contact, and may be viewed as a self-contained alternative equal to existing forms of social interaction.

SOC, on the other hand, was confirmed as moderating the influence of PE on BI and the effect of HM on BI. In the case of PE, a positive moderation was expected, as coworkers'

perception of social entanglement and belonging increases the likelihood of not only identifying a suitable contact but also being able to benefit from it. For the HM-BI relation, however, SOC reveals an impact contrariwise to our hypothesis, yielding a negative effect. We would have assumed that a high SOC boosts the impact of hedonic factors. Our empirical data suggests, on the contrary, that a lower SOC corresponds to a stronger link, and a higher SOC corresponds to a weaker link. We believe the spirit of coworking can explain this result: a high SOC is likely related to an open and welcoming atmosphere, and in such an environment, the main benefit a matchmaking application may offer is facilitating interaction in terms of efficiency; nevertheless, the community spirit would have allowed for social interaction without the tool, and coworkers who identify with coworking's values (see, e.g., Schuermann, 2014) may find enjoyment primarily in personal interaction.

6.6.1 Theoretical Implications

The study at hand addressed matchmaking tools in coworking-spaces, which has been hardly investigated (Kopplin, 2020), although the digital infrastructure is an essential component of coworking (Bouncken et al., 2021). We advanced the body of knowledge by erecting a coworking-specific technology acceptance model, drawing on well-established insights from the literature (see, e.g., Venkatesh et al., 2012). Empirical insights confirmed our structural model, providing insights into the dual-purpose nature of matchmaking tools. Regarding the social composition of coworking-spaces, we found relatively stable communities with medium- to long-term memberships, and individual rooms and fixed desks were as equally frequent as hot desks. Hence, coworking in independent coworking-spaces is shown to not consist primarily of fast-moving digital nomads but instead of individuals seeking a place where they can get things done – which is consistent with the third-place notion of coworking-spaces and the origin of coworking, when knowledge workers sought to break free from isolation at home (Brown, 2017; Moriset, 2013; Oldenburg, 1989). We also provided empirical evidence for coworkers' social orientation (i.e., sense of community) and its impact on technology within the coworking-space, and coworkers' proclivity to view the coworking environment as a learning opportunity. This fits the notion of gainers (Colleoni & Arvidsson, 2015) and novices and mentors (Bouncken & Aslam, 2019), respectively. Further, as learning was a common motive regardless of the personal background, we provide support for the suggestion by Waters-Lynch and Potts (2017) to consider learning as the overarching concept of coworking-spaces.

Our findings suggest that matchmaking tools may amend coworking-spaces as an original class of amenities. They appear not to be influenced by face-to-face interaction. We believe that as digital platforms, accessible anytime and anywhere, they may provide feelings of security and structure. An important motive for coworking is the precarity and atomization of work (Brown, 2017; McRobbie, 2018), and coworking-space' community may mitigate the impression of being isolated and lost. Matchmaking tools not only visualize the community but make it tangible in a literal sense, as users may swipe, touch, and physically experience the rather abstract concepts of community and collaboration. In a Schelling Point sense (Waters-Lynch & Potts, 2017), when individuals perceive that coworking-spaces are a focal point to approach, matchmaking tools can be viewed as a technological manifestation of this perception, as they present an impression of the coworking-space' community, skills, and learning and business opportunities in a structured and comprehensible manner. Consequently, we frame matchmaking tools as a potential remedy for the insight that, frequently, unexpected encounters are fairly scarce (Merkel, 2015; Parrino, 2015).

Considering technology acceptance research, our analyses show that a combined approach examining necessary as well as sufficient conditions helps increase our understanding of the underlying causal mechanisms. A mere focus on sufficiency – as is the case with regression-based models – would have overlooked essential constraints such as the substantial effect of EE. Awareness of this duality is expected to enable researchers to improve our insights into technology acceptance. The variable SOA further included notions of alternative options the individual coworker may use for socializing. Our data did not provide evidence that the availability of alternatives alters user perceptions of the technology.

6.6.2 Practical Implications

Coworkers were found to be willing to employ matchmaking tools for their daily activities in the coworking-space. While utilitarian factors play the most critical role in their decision-making, HM has been identified as an important driver as well.

Coworkers' satisfaction with offline activities, i.e., events like workshops or pitch sessions, did not have an impact on their perception of matchmaking tools. Consequently, the physical and the digital realm may be viewed as complements rather than as substitutes. As matchmaking tools may establish connections without both coworkers needing to be present within the coworking-space, they have an advantage over personal interaction in terms of temporal and spatial independence. However, on the other hand, face-to-face contact is much

richer and more natural compared to software applications. Hence, coworkers may seek to utilize both to get ‘the best of both worlds’. coworking-space providers should support this entanglement and provide easy-access and up-to-date member databases that are not only lists of coworkers but ready to be analyzed using, for example, matchmaking tools, but also simple queries such as ‘who works on a website’ and ‘who is currently present in my coworking-space’. Consequently, a matchmaking tool may not be replaced by physical, social events but is a fruitful amenity for a coworking-space.

As a sense of community was found to have a positive influence on the effect of PE on intention to use, we may conclude that the digital realm is an enhancement of the physical space that makes the community spirit tangible, and, consequently, this digital layer may also increase coherence and solidarity by providing a who is who of the coworking-space.

6.6.3 Limitations

Our study was conducted among German coworking-spaces to prevent biases stemming from diversity in the cultural background (see also Bouncken et al., 2018). Consequently, our results need to be treated with care when being applied to other settings. Further, the majority of responses were gathered in coworking-spaces located in major cities. Thus, our findings are generally applicable to urban coworking, and further assessment will be helpful to gain insights into coworking in the countryside. Further, the sample sizes can be considered reasonably small. However, PLS-SEM has been found to yield high statistical power even in small-N situations, and, as such, our results appear reasonable. Nevertheless, it is deemed essential to replicate our findings drawing on larger samples. Finally, we opted for independent coworking-space as our target population, and hence, the results should not be adapted for different types without caution.

6.6.4 Future Research

A typical downside of matchmaking, in general, is that the better it works, the more satisfied the users are, and when they found what they were looking for, they are ready to abandon the platform (Kopplin, 2021). In the context of coworking, most respondents indicated that they have already been in their current coworking-space for a rather long time and also intend to stay a member. As most coworkers have not used a matchmaking tool before, it would be a valuable insight whether the implementation of such an application reduced the membership duration. Also, as our sample was reasonably small, we could not examine

potential differences between types of coworking-space users, i.e., utilizers, socializers, and learners, which is a promising opportunity for further investigation. In similar regard, our findings may be challenged by targeting coworking-space other than independent ones as a population. For example, corporate coworking-space (Bouncken et al., 2018) would highly benefit from knowledge exchange, inspiration, and innovation.

Besides, both theoretical and empirical studies covering matchmaking tools are rather scarce. Particularly in the context of coworking-space, coworkers may seek membership for reasons other than searching for a business partner; e.g., they may want to overcome social isolation and achieving a better work-life balance (De Peuter, Cohen, & Saraco, 2017; Orel, 2019; Spinuzzi, 2012). It might be helpful to develop a typology of matchmaking tools, as different user motives may require different application layouts and functions, and examine the role of these technologies for social and hedonic purposes. Finally, future research should consider other software that can be used in coworking-space in addition to matchmaking software tools. As mentioned in the introduction, innovation management software could be an example that regulates and possibly simplifies the process of joint innovation in coworking-space, after matchmaking tools facilitated social connections and elicited serendipity, creativity, and innovation.

6.7 CONCLUSION

Concerning the matchmaking tools' embedding within coworking-space, i.e., their locus in a sociomaterial space, it is essential to note that they are subject to ephemerality (Orlikowski, 2007). These applications provide an interface between coworkers, and, in essence, they are a mediator between individuals and, consequently, contingent upon the coworking-space members, which may vary from day to day. Future research might embrace this dynamic complexity by employing qualitative instruments such as Grounded Theory (Corbin and Strauss 1990), or configurational methods at the intersection of qualitative and quantitative work, such as fuzzy-set qualitative comparative analysis (Ragin, 2009). The study at hand sought to provide insights into the matter by combining necessary and sufficient conditions through means of NCA and PLS-SEM, respectively, which might be carried on in future works.

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6.8 APPENDIX

Construct	Item		Outer loading	Adopted from
Performance expectancy	PE1	A matchmaking tool is useful for my daily work	0.879	Venkatesh et al. (2012)
	PE2	Using a matchmaking tool increases my chances to achieve things that are important to me	0.921	
	PE3	A matchmaking tool helps me achieve things faster	0.936	
	PE4	Using a matchmaking tool increases my productivity	0.904	
Effort expectancy	EE1	Learning how to use a matchmaking tool is easy for me	0.827	Venkatesh et al. (2012)
	EE2	My interaction with the matchmaking tool is clear and understandable	0.845	
	EE3	I find a matchmaking tool easy to use	0.780	
	EE4	It is easy for me to become skillful at using a matchmaking tool	0.813	
Hedonic motivation	HM1	Using a matchmaking tool is fun	0.934	Venkatesh et al. (2012)
	HM2	Using a matchmaking tool is enjoyable	0.901	
	HM3	Using a matchmaking tool is very entertaining	0.820	
Personal innovativeness	PI1	If I heard about a new information technology, I would look for ways to experiment with it	0.913	Agarwal and Prasad (1998)
	PI2	Among my peers, I am usually the first to try out new information technologies	0.836	
	PI3	In general, I am hesitant to try out new information technologies (reversed)	0.547	
	PI4	I like to experiment with new information technologies	0.873	
Behavioral intention	BI1	I intend to use a matchmaking tool when available	0.912	Venkatesh et al. (2012)
	BI2	I will try to use a matchmaking tool in my daily life	0.818	
	BI3	I plan to use a matchmaking tool regularly	0.926	
	BI4	I intend to recommend using a matchmaking tool	0.849	
Perceived relevance	PR1	A matchmaking tool within my coworking-space would be relevant to me	0.904	Alalwan (2018)
	PR2	A matchmaking tool within my coworking-space would be important	0.901	
	PR3	A matchmaking tool within my coworking-space would fit my interests	0.948	
	PR4	A matchmaking tool within my coworking-space would meet my preferences	0.939	
Satisfaction with offline activities	SOA1	I am satisfied with the offered offline activities	0.918	Arbaugh (2000), Liaw (2008)
	SOA2	I am satisfied with using my coworking-space's offline activities	0.797	
	SOA3	My coworking-space's offline activities satisfy my needs	0.667	
Sense of community	SOC1	I feel like a member of this coworking-space	0.925	Peterson et al. (2008)
	SOC2	I belong to this coworking-space	0.938	
	SOC3	I feel connected with my coworking-space	0.825	
	SOC4	I have good connections with my fellow coworkers	0.603	

Table 28: Constructs and items (translated from German)

	BI1	BI2	BI3	BI_4	EE1	EE2	EE3	EE4	HMI	HM2	HMS	PE1	PE2	PE3	PE4	PI1	PI2	PI3	PI4	PR1	PR2	PR3	PR4	SOA1	SOA2	SOA3	SoC1	SoC2	SoC3	SoC4
BI1	2.062	1.223	1.791	1.252	0.399	0.491	0.227	0.863	1.133	0.610	1.326	1.185	1.147	1.130	0.683	0.711	0.195	0.415	1.509	1.664	1.593	-0.071	-0.007	0.128	0.204	0.131	-0.019	-0.053	1.545	
BI2	1.223	1.793	1.299	0.995	0.636	0.342	0.413	0.418	0.723	0.989	0.489	1.049	0.967	0.913	0.951	0.592	0.370	0.353	0.337	1.217	1.152	1.038	0.002	-0.030	-0.003	0.228	0.272	0.130	-0.071	0.995
BI3	1.791	1.299	2.122	1.323	0.470	0.470	0.478	0.264	0.758	1.005	0.592	1.253	1.255	1.190	1.139	0.780	0.723	0.204	0.446	1.462	1.473	1.486	-0.124	-0.031	0.024	0.250	0.196	0.076	0.046	1.476
BI4	1.252	0.995	1.323	1.614	0.512	0.580	0.426	0.358	0.798	0.867	0.558	0.947	0.817	0.810	0.843	0.558	0.356	0.240	0.354	1.198	1.119	1.048	0.052	0.069	0.218	0.218	0.324	0.097	0.003	1.207
EE1	0.522	0.636	0.470	0.512	1.024	0.624	0.462	0.736	0.405	0.432	0.205	0.557	0.396	0.342	0.402	0.375	0.368	0.643	0.286	0.460	0.446	0.460	0.133	0.037	0.071	-0.110	0.072	-0.031	0.116	0.470
EE2	0.399	0.342	0.470	0.580	0.624	1.136	0.642	0.699	0.509	0.507	0.401	0.439	0.422	0.332	0.477	0.172	0.197	0.143	0.085	0.602	0.437	0.493	0.066	0.072	0.031	-0.125	0.080	0.060	0.027	0.659
EE3	0.491	0.413	0.478	0.426	0.462	0.642	1.106	0.541	0.443	0.594	0.518	0.516	0.445	0.348	0.496	0.390	0.241	0.225	0.148	0.656	0.519	0.601	0.118	0.018	-0.005	0.048	0.183	0.234	0.078	0.709
EE4	0.227	0.418	0.264	0.358	0.736	0.699	0.541	1.163	0.342	0.403	0.187	0.291	0.320	0.201	0.297	0.420	0.399	0.592	0.322	0.303	0.242	0.294	0.137	0.068	0.077	0.016	0.085	0.017	0.201	0.489
HM1	0.863	0.723	0.758	0.798	0.405	0.509	0.443	0.342	1.163	0.936	0.893	0.872	0.722	0.690	0.596	0.403	0.246	0.043	0.388	1.042	0.992	0.984	-0.016	0.077	0.124	-0.093	0.074	0.017	-0.261	0.951
HM2	1.133	0.989	1.005	0.867	0.432	0.507	0.594	0.403	0.936	1.336	0.740	1.008	0.961	0.902	0.841	0.411	0.285	0.125	0.277	1.153	1.198	1.146	0.008	-0.011	0.029	0.159	0.128	0.156	-0.127	1.314
HM3	0.610	0.489	0.592	0.558	0.205	0.401	0.518	0.187	0.893	0.740	1.288	0.727	0.498	0.478	0.452	0.509	0.205	0.076	0.285	0.804	0.749	0.750	-0.010	0.119	0.155	0.045	0.186	0.150	-0.146	0.704
PE1	1.376	1.049	1.253	0.947	0.557	0.439	0.516	0.291	0.872	1.008	0.727	1.763	1.320	1.353	1.293	0.364	0.411	0.219	0.025	1.329	1.349	1.319	0.057	0.069	0.169	-0.045	0.051	-0.031	-0.243	1.220
PE2	1.185	0.967	1.255	0.817	0.396	0.422	0.445	0.320	0.722	0.961	0.498	1.320	1.879	1.587	1.488	0.261	0.247	-0.280	-0.004	1.321	1.306	1.290	0.047	-0.024	0.062	-0.035	-0.084	-0.008	-0.159	1.234
PE3	1.147	0.913	1.190	0.810	0.342	0.332	0.348	0.201	0.690	0.902	0.478	1.353	1.587	1.859	1.549	0.114	0.217	-0.397	-0.152	1.283	1.261	1.234	0.074	-0.052	0.102	0.043	0.087	0.141	-0.082	1.136
PE4	1.130	0.951	1.139	0.843	0.402	0.477	0.496	0.297	0.596	0.841	0.452	1.293	1.488	1.549	1.926	0.104	0.204	-0.540	-0.256	1.398	1.301	1.252	0.049	-0.108	-0.061	0.083	0.138	0.080	0.137	1.279
PI1	0.683	0.592	0.780	0.558	0.375	0.172	0.390	0.420	0.403	0.411	0.509	0.364	0.261	0.114	0.104	2.040	1.528	1.006	1.346	0.524	0.651	0.727	0.232	0.288	0.264	0.589	0.575	0.378	0.341	0.515
PI2	0.711	0.370	0.723	0.356	0.368	0.197	0.241	0.399	0.246	0.285	0.205	0.411	0.247	0.217	0.204	1.528	2.741	0.982	1.495	0.345	0.560	0.529	0.250	0.149	0.224	0.370	0.041	-0.131	0.522	0.493
PI3	0.195	0.353	0.204	0.240	0.643	0.143	0.225	0.592	0.043	0.125	0.076	0.219	-0.280	-0.397	-0.540	1.006	0.982	2.834	0.970	0.093	0.124	-0.122	0.271	0.349	0.269	0.274	0.164	0.139	0.172	-0.092
PI4	0.415	0.337	0.446	0.354	0.286	0.085	0.148	0.322	0.388	0.277	0.285	0.025	-0.004	-0.152	-0.256	1.346	1.495	0.970	1.857	0.256	0.337	0.225	0.189	0.367	0.250	0.260	0.059	0.142	0.152	0.265
PR1	1.545	0.995	1.476	1.207	0.470	0.659	0.709	0.489	0.951	1.314	0.704	1.220	1.234	1.136	1.279	0.515	0.493	-0.092	0.265	2.272	1.795	1.769	1.706	-0.031	-0.018	0.135	0.321	0.317	0.179	0.201
PR2	1.509	1.217	1.462	1.198	0.460	0.602	0.656	0.303	1.042	1.153	0.804	1.329	1.321	1.283	1.398	0.524	0.345	-0.093	0.256	2.532	1.824	1.832	0.142	0.056	0.085	0.134	0.340	0.170	-0.156	1.795
PR3	1.664	1.152	1.473	1.119	0.446	0.437	0.519	0.242	0.992	1.198	0.749	1.349	1.306	1.261	1.301	0.651	0.560	0.124	0.337	1.824	2.094	1.887	-0.137	-0.050	0.082	0.171	0.158	0.101	-0.067	1.769
PR4	1.593	1.038	1.486	1.048	0.460	0.493	0.601	0.294	0.984	1.146	0.750	1.319	1.290	1.234	1.252	0.727	0.529	-0.122	0.225	1.832	1.887	2.117	-0.102	-0.019	0.120	0.216	0.259	0.132	0.007	1.706
SOA1	-0.071	0.002	-0.124	0.052	0.133	0.066	0.118	0.137	-0.016	0.008	-0.010	0.057	0.047	0.074	0.049	0.232	0.250	0.271	0.189	0.142	-0.137	-0.102	0.882	0.513	0.325	0.403	0.432	0.342	0.367	-0.031
SOA2	-0.007	-0.030	-0.031	0.069	0.037	0.072	0.018	0.068	0.077	-0.011	0.119	0.069	-0.024	-0.052	-0.108	0.288	0.149	0.349	0.367	0.056	-0.050	-0.019	0.513	0.823	0.496	0.325	0.312	0.395	0.170	-0.018
SOA3	0.128	-0.003	0.024	0.218	0.071	0.031	-0.005	0.077	0.124	0.029	0.155	0.169	0.062	0.102	-0.061	0.264	0.224	0.269	0.250	0.085	0.082	0.120	0.325	0.496	0.274	0.199	0.248	0.212	0.135	
SoC1	0.204	0.228	0.250	0.218	-0.110	-0.125	0.048	0.016	-0.093	0.159	0.045	-0.045	-0.035	0.043	0.083	0.589	0.370	0.274	0.260	0.134	0.171	0.216	0.403	0.322	0.274	1.876	1.543	1.254	1.362	0.321
SoC2	0.131	0.272	0.196	0.324	0.072	0.080	0.183	0.085	0.074	0.128	0.186	0.051	-0.084	0.087	0.138	0.575	0.041	0.164	0.059	0.340	0.158	0.259	0.432	0.312	0.199	1.543	2.231	1.566	1.223	0.317
SoC3	-0.019	0.130	0.076	0.097	-0.031	0.060	0.234	0.017	0.156	0.150	-0.031	-0.008	0.141	0.080	0.378	-0.131	0.139	0.142	0.170	0.101	0.132	0.342	0.395	0.248	1.254	1.566	1.876	1.008	1.008	1.008
SoC4	-0.053	-0.071	0.046	0.003	0.116	0.027	0.078	0.201	-0.261	-0.127	-0.146	-0.243	-0.159	-0.082	0.137	0.341	0.522	0.172	0.152	-0.156	-0.067	0.007	0.367	0.170	0.212	1.362	1.223	1.008	2.379	0.201

Table 29: Indicator covariance matrix

	BI	EE	HM	PE	PI	PR	SOA	SOC
BI	0.877							
EE	0.437	0.816						
HM	0.673	0.503	0.886					
PE	0.709	0.384	0.614	0.910				
PI	0.340	0.275	0.262	0.065	0.805			
PR	0.793	0.425	0.732	0.750	0.246	0.923		
SOA	0.005	0.124	0.039	0.046	0.248	0.003	0.800	
SOC	0.134	0.027	0.069	0.020	0.198	0.127	0.343	0.834

Table 30: Evaluation of the Fornell-Larcker criterion

	BI	EE	HM	PE	PI	PR	SOA	SOC
BI1	0.912	0.350	0.629	0.676	0.316	0.796	-0.009	0.079
BI2	0.818	0.403	0.573	0.587	0.267	0.593	-0.005	0.137
BI3	0.926	0.349	0.557	0.672	0.339	0.732	-0.062	0.109
BI4	0.849	0.439	0.602	0.545	0.268	0.649	0.096	0.150
EE1	0.438	0.827	0.361	0.342	0.293	0.328	0.126	-0.023
EE2	0.349	0.845	0.451	0.317	0.112	0.370	0.070	-0.013
EE3	0.356	0.780	0.494	0.348	0.207	0.426	0.084	0.094
EE4	0.243	0.813	0.303	0.208	0.298	0.222	0.129	0.027
HM1	0.605	0.466	0.934	0.544	0.246	0.665	0.042	-0.002
HM2	0.716	0.496	0.901	0.651	0.220	0.753	0.011	0.102
HM3	0.411	0.349	0.820	0.388	0.238	0.479	0.061	0.084
PE1	0.713	0.412	0.668	0.879	0.158	0.711	0.083	0.001
PE2	0.637	0.343	0.553	0.921	0.077	0.680	0.035	-0.026
PE3	0.615	0.271	0.527	0.936	0.008	0.651	0.054	0.045
PE4	0.605	0.361	0.472	0.904	-0.020	0.680	-0.007	0.057
PI1	0.378	0.276	0.303	0.123	0.913	0.308	0.223	0.299
PI2	0.269	0.209	0.152	0.134	0.836	0.212	0.173	0.072
PI3	0.122	0.273	0.049	-0.111	0.547	-0.019	0.216	0.096
PI4	0.236	0.175	0.234	-0.054	0.873	0.144	0.222	0.091
PR1	0.718	0.456	0.683	0.653	0.203	0.904	0.010	0.153
PR2	0.701	0.383	0.644	0.677	0.176	0.901	0.089	0.112
PR3	0.774	0.346	0.698	0.729	0.272	0.948	-0.059	0.086
PR4	0.735	0.384	0.679	0.709	0.254	0.939	-0.028	0.119
SOA1	-0.030	0.141	-0.005	0.049	0.193	-0.029	0.918	0.330
SOA2	0.001	0.059	0.059	-0.022	0.251	-0.008	0.797	0.282
SOA3	0.081	0.049	0.097	0.059	0.206	0.078	0.667	0.189
SOC1	0.136	-0.040	0.029	0.005	0.243	0.112	0.332	0.925
SOC2	0.128	0.084	0.082	0.026	0.146	0.129	0.301	0.938
SOC3	0.043	0.063	0.076	0.025	0.103	0.076	0.306	0.825
SOC4	-0.010	0.075	-0.117	-0.049	0.161	-0.001	0.241	0.603

Table 31: Cross-loadings

Note: Indicator loadings on their assigned constructs are highlighted in bold.

Coworking-Space	Location	Number of responses
Alte Kliniken Coworking Wiesbaden	Wiesbaden	1
Base Co-Working München	Munich	5
betahaus Hamburg Schanze	Hamburg	2
collective.ruhr	Essen	1
Coworking 4You	Overath	1
Coworking Aachen	Aachen	1
CWS IM.PULS	Berlin	2
Design Offices Dusseldorf Fürst & Friedrich	Dusseldorf	1
Design Offices Leipziger Platz	Berlin	2
EduRent Regensburg	Regensburg	3
Engelnest Coworking	Berlin	1
Factory Görlitzer Park	Berlin	4
Fleet7 Kiel	Kiel	3
HeartSpace	Berlin	2
ImpactHub Stuttgart	Stuttgart	1
KiezBüro Jägerstrasse	Berlin	1
KiezBüro Neustrelitz	Berlin	1
MietWerk Potsdam	Potsdam	1
Nunzig Aachen	Aachen	1
RaumZeit	Hannover	3
Regus Berlin Leuchtenfabrik	Berlin	1
Ruca	Tübingen	1
Space Shack	Berlin	10
Spaces Alte Post	Berlin	3
Spaces Düsseldorf Andreas Quartier	Dusseldorf	1
Spaces Kennedydamm	Dusseldorf	1
St. Oberholz	Berlin	3
Think Space	Berlin	1
TinkTank	Heidelberg	1
Trafo Braunschweig	Braunschweig	4
Tuesday Coworking	Berlin	4
WeWork München	Munich	1
WeWork Oskar von Miller München	Munich	1
WeWork Stralauer Allee München	Munich	1
WeWork Taunusanlage	Frankfurt	2
WeWork Warschauer Platz	Berlin	1
Wexelwirken	Reutlingen	3
Workrepublic Düsseldorf Medienhafen	Dusseldorf	4
Workrepublic Hamburg Neuer Dovenhof	Hamburg	3
Workrepublic Hamburg Neuer Wall	Hamburg	6
Workrepublic Viktualienmarkt	Munich	1
Worqs Aachen	Aachen	1
Zammwerk Chemnitz	Chemnitz	1

Table 32: Responses per Coworking-space

7 OLD GUARDS OR NEW FRIENDS? RELATIONAL AWARENESS AND MOTIVATION IN OPPORTUNITIES SEIZING

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7.1 ABSTRACT

This study uses behavioral drivers to examine the variation in managerial cognition impact on opportunities seizing. Behavioral drivers of firms’ actions have so far been focused on rivalry, leaving relational modes of interaction relatively unattended. In this study, we fill this gap by introducing relational awareness and relational motivation of managers toward their environment. Our study of 400 Polish firms indicates that relational awareness and motivation are significantly associated with the durability and heterogeneity of inter-organizational relationships (IORs) that managers establish to seize market opportunities. However, relationship heterogeneity is focused on the supply chain, while the broader value network is not relevant to managers.

7.2 INTRODUCTION

Understanding what drives firms’ strategic action is central to strategy research. The choice of action depends on the way managers frame and represent problems (Levinthal, 2011), evaluate alternatives (Pellegrini & Ciappei, 2015), and make decisions (Powell, Lovallo, & Fox, 2011). The managerial cognition literature’s fundamental tenet is that the environment is not entirely exogenous to the firm, but that managers develop simplified interpretations of the environment, which in turn drive organizational behavior (Eggers & Kaplan, 2013). Managerial cognition is consequential for competitive actions (Nadkarni & Barr, 2008), identifying opportunities (Shepherd, McMullen, & Ocasio, 2017), seizing opportunities (Teece, 2007), capability development (Laamanen & Wallin, 2009), investment patterns (Kaplan, 2008), ability to change (Helfat & Peteraf, 2015), and ultimately enhance firms’ performance (Fawcett & Waller, 2012). Hence, firms’ performance heterogeneity can be attributed to behavioral deviations from rationality, driven by cognitive processes in the pursuit of opportunities (Gavetti, 2012).

The Awareness-Motivation-Capability (AMC) framework provides a behavioral logic and conceptual platform for examining competitive dynamics (Chen, 1996). This seminal framework assumes that firms' competitive behaviors depend on the following: the degree of awareness managers have of who their competitors are and what they do; their motivation to take action; and the capabilities needed to effectively address competitive threats. Given that managers and top management teams differ in these terms, so will differ firms' competitive behaviors, which contributes to explain their performance heterogeneity. Despite recent progress in applying the AMC framework to factors that predispose firms to engage in alliances (Stadtler & Lin, 2017), an asymmetry of understanding strategic action persists, leaving modes of interaction other than rivalry, such as competition-cooperation or relational, far less attended (Chen & Miller, 2015).

In contrast to rivalry, which essentially involves attacks and responses toward threatening actors and aims at appropriating value, relational interaction is important for seizing opportunities for joint value creation (Czakon & Kawa, 2018). Managers are encouraged to shape their business environment by instrumentally selecting the type of relationship and actors to create value otherwise unattainable (Jarzabkowski & Bednarek, 2018), create value (Matinheikki, Pesonen, Arto, & Peltokorpi, 2017), capture value (Bouncken, Fredrich, & Kraus, 2020), and more generally reach out for corporate goals (Cheng & Sheu, 2012). Hence, while competitive actions and responses are central to the rivalrous mode of competitive dynamics, the relational mode requires some kind of joint action observable through inter-organizational relationships or IORs (Cheng & Sheu, 2012). The rapidly growing literature on modes of interaction other than rivalry encourages to reconceptualize competitive dynamics, but empirical research on behavioral drivers in the relational mode of interaction is much needed (Chen & Miller, 2015).

Our study taps into this gap. Our study aims to examine the impact of behavioral drivers on opportunities seizing. By analogy to Chen's AMC framework (1996), we posit that managers display various degrees of relational awareness and motivation reflected in the IORs they establish to achieve strategic goals. Similar to various competitive actions that firms take depending on managers' awareness and motivation, firms are also likely to establish various IORs to seize market opportunities. We take the individual level of analysis to address the question of how managers use IORs in view of market opportunities seizing, depending on their relational awareness and motivation? We collect perceptual data to test managers'

relational awareness and motivation association with market opportunities seizing. Our study provides three noteworthy contributions. First, we fill in the conceptual gap in the competitive dynamics literature that appeared when relational modes of interaction have been incorporated into conceptual frameworks (Chen & Miller, 2015). Indeed, established behavioral drivers of rivalry have so far not been complemented with similar drivers of collaboration. Hence, we formally define the constructs of relational awareness and relational motivation. Second, we empirically substantiate the relevance of relational awareness and relational motivation for seizing market opportunities. Top managers' relational awareness and relational motivation are consequential for developing durable and heterogeneous IORs, which in turn are important for seizing market opportunities. Third, we find that managers' relational awareness and motivation are limited to the supply chain and missed opportunities embedded in the broader set of actors and prospective relationships of a value network.

7.3 CONCEPTUAL FOUNDATION AND HYPOTHESES DEVELOPMENT

In this section, we explain that if awareness and motivation to compete are useful in predicting the likelihood of a firm's response to competitive threats, then symmetrical concepts of relational awareness and relational motivation may be useful in predicting the likelihood of opportunities seizing, mediated by characteristics of IORs that firms establish and maintain.

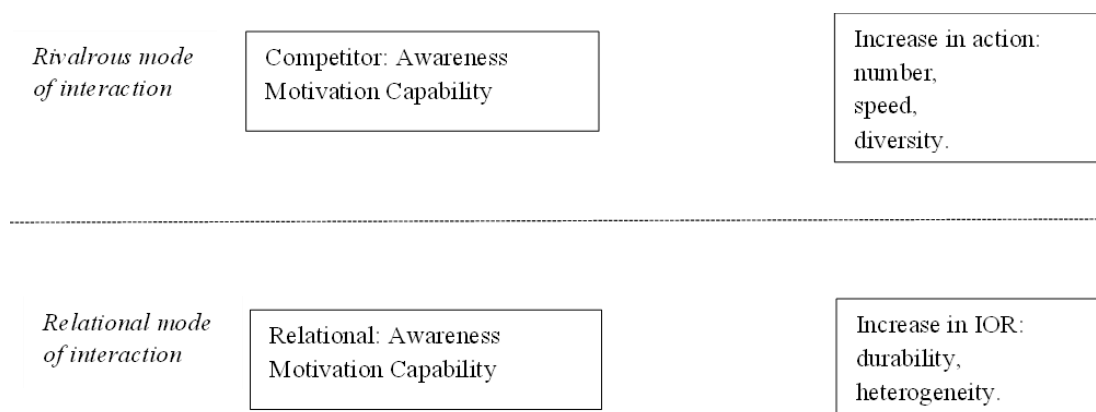
7.3.1 Behavioral Drivers of firm Interactions

Markets are long recognized to be constrained by a structure of connections between relevant actors (Burt, 1992). Firms' embeddedness in inter-organizational networks is consequential for information access, economic action, and performance (Uzzi, 1997). Essentially, access to information and related opportunities are not evenly distributed across markets, which may create privileged opportunities for firms that are more central, while delaying peripheral actors' awareness, hampering the flow of resources, and making their actions more difficult (Gnyawali & Madhavan, 2001). Therefore, the network stream of strategy research suggests that purposeful shaping of a relationships network around the focal firm (Möller & Halinen, 2017), configuring relationships (Ricciardi, Zardini, Czakon, Rossignoli, & Kraus, 2021), and taking active roles in such networks (Ritala, De Kort, & Gailly, 2023) may open up opportunities otherwise unavailable. However, by taking a structural approach, the network stream of literature has long under-exploited the individual actor level of analysis. Recent

interest in how managers perceive their network surroundings indicates that they develop their network pictures (Abrahamsen, Henneberg, & Naudé, 2012) and act depending on their representations of how the firm is embedded in a net of IORs. Hence, firms' competitive actions are driven by behavioral factors such as managers' awareness of relevant actors and events in their environment and the sense attributed to those cues.

Behavioral drivers help explain the likelihood of action or reactions, within a socially constructed set of actors that constrain managers' cognition. Managers can only respond to threats they perceive, are willing to respond to, and are able to effectively address (Chen & Miller, 2015). The competitive dynamics research stream provides behavioral explanations of competitive actions and reactions toward a given rival (Chen, Su, & Tsai, 2007), within a defined set of mutually perceived rivals (Porac, Thomas, & Baden-Fuller, 2011), including possible actions even toward those who are not specifically known or who are not competing (Jarzabkowski & Bednarek, 2018). The AMC framework is commonly used to examine the cognitive drivers of actions that managers are likely to take toward rivals (Figure 9). The more managers are aware of, motivated to, and capable of responding to competitive threats, the more likely it is that the number, speed, and diversity of competitive actions will increase (Livengood & Reger, 2010). Interestingly, competitive awareness is selective, which may result in possible omissions of relevant threats, leading to the emergence of competitive blind spots that can hurt the focal firm (Downing, Kang, & Markman, 2019).

Figure 10: Proposed model of rivalrous and relational modes of interaction.



With an exclusive focus on rivalry, the competitive dynamics literature contributes to explain the competitive architecture of markets. However, this leaves modes of interaction other than rivalry beyond the scope of attention (Chen & Miller, 2015). Indeed, firms can establish and maintain various types of relationships with various actors, including competitors, buyers,

suppliers, and wider stakeholders to jointly create value and avoid harmful competitive wars (Jarzabkowski & Bednarek, 2018). Four types of relationships have been identified: 1) competition, where a rivalrous mode is adopted in the pursuit of the same goals by many actors; 2) collaboration, where a relational mode of interaction is used to achieve individual and common objectives; 3) coopetition, which involves collaboration with competitors; and 4) co-existence, where no interactions can be noticed between firms from the same industry (Bengtsson & Kock, 1999).

To capture a more comprehensive picture of market relational architecture, researchers offer conceptual (Chen & Miller, 2015) and empirical (Stadtler & Lin, 2017; Zakrzewska-Bielawska & Lewicka, 2021) extensions. Reconceptualizing the competitive dynamics to incorporate modes of interaction other than rivalry involves a different repertoire of (Chen & Miller, 2015): a) actors such as suppliers, buyers, competitors, and other stakeholders; b) actions such as collaboration or coopetition; and c) aims such as private and common benefits as well as nonmarket outcomes. In this view, joint value-creating activities are included in the scope of firms' relational behaviors, ranging from setting technology standards (Garud, Jain, & Kumaraswamy, 2002) to developing new products (Weber & Heidenreich, 2018), sharing resources (Sonenshein, Nault, & Obodaru, 2017), resource utilization maximization (Chiambaretto & Wassmer, 2019), and combining products (Czakon, Klimas, & Mariani, 2020). These actions can be both competitive and cooperative or nonmarket (Gnyawali, He, & Madhavan, 2006). Regardless of their scope and particular objectives, the relational mode of interactions involves establishing and maintaining IORs (Cheng & Sheu, 2012; Zakrzewska-Bielawska, 2019). Differently from rivalry that is observable through firm's actions, the relational mode requires joint actions of two or more firms that is observable through IORs.

Firms' proclivity towards alliance with various partners (Bouncken & Fredrich, 2016) is reflected in purposeful IORs shaping to effectively address increase in opportunities. The recent COVID19 vaccine race provides a compelling illustration with 93 partnerships formed to develop a vaccine only in one year, which is in sharp contrast to only 101 partnerships in the period 1991–2011 (Druehl, Minssen, & Price, 2021). Ample empirical evidence suggests that IORs are important for opportunities seizing through innovation, but requires careful management of tensions (Bouncken, Fredrich, & Kraus, 2020) to effectively create and capture value. While a substantial and growing body of literature addresses the

issue of managing innovation involving IORs (Möller & Halinen, 2017) much less attention has been allocated to the behavioral drivers of relational interaction in view of market opportunities seizing.

Empirical studies on the behavioral drivers of interaction modes other than rivalry are scant (Chen & Miller, 2015). Behavioral drivers encapsulated in the AMC framework (Chen, 1996) are seminal for understanding competitive dynamics toward a given rival. Recent studies encourage exploiting the AMC framework when examining what drives collaboration. A study of 212 environmental-focused alliances reported that drivers related to awareness, motivation, and capability are relevant for adopting sustainable environmental strategies (Stadtler & Lin, 2017). Similarly, Jarzabkowski and Bednarek (2018) showed that relational awareness and relational motivations are different from rivalrous ones. Hence, the AMC framework originally developed for understanding rivalry can be useful to better understand the relational mode of interaction but calls for a granular operationalization.

Relational awareness refers to the degree to which managers consider relationships with others as instrumental in achieving strategic objectives (Bouncken, Fredrich, & Kraus, 2020). Managers understand to various degrees supply chain collaboration (Barratt, 2004) or value embedded in collaboration with competitors (Czakoń et al., 2020) and other stakeholders (Weber & Heidenreich, 2018). We follow the general meaning of awareness, not restricted to observable actions of a partner, but including “*possible actions by those who are not specifically known or who are not competing*” (Jarzabkowski & Bednarek, 2018, p. 822). Managers need to perceive prospective actors that may be involved in joint value creation (Czakoń et al., 2020). Consistently with the value network framework (Brandenburger & Nalebuff, 1996), these actors may involve customers, suppliers, competitors, complementors, or other non-market stakeholders (Chen & Miller, 2015). Recent empirical studies indicate that managers display a preference for suppliers and customers, rather than competitors or complementors, and that such a preference translates into a network myopia effect, preventing them from sensing opportunities embedded in networks (Czakoń & Kawa, 2018). Hence, similar to competitive blind spots that expose firms to unattended competitive threats (Downing et al., 2019), limited awareness of relationships surrounding firms may prevent them from effectively identifying and seizing market opportunities. All in all, managers display various degrees of relational awareness, which may be consequential for market opportunities seizing.

Relational motivation refers to the willingness to act jointly with others, rather than to act alone. In our study, we focus on direct relationships that “*result from direct negotiation among all involved organizations that remain legally independent*” (Castaner & Oliveira, 2020, p. 971). Firms use them to pursue value creation by combining resources for improved resource utilization (Chiambaretto & Wassmer, 2019), sharing knowledge (Sonenshein et al., 2017), increasing speed to market (Bouncken, Fredrich, & Kraus, 2020), and gaining access to foreign markets jointly with other actors (Barringer & Harrison, 2000). As such, IORs are instrumental in the pursuit of private benefits of the actors involved as well as common benefits that they agree upon (Khanna, Gulati, & Nohria, 1998). A recent ethnographic study identified relational motivations such as pricing motivation, market motivation, normative motivation, and client motivation when engaging in IORs (Jarzabkowski & Bednarek, 2018).

In our study, we focus on cognitive, individual-level drivers of a firm’s behaviors. We leave the third driver of competitive dynamics, that is capability, beyond the scope of this analysis, as it is located at the organizational level, and refers to resource endowments (Chen & Miller, 2015). Accordingly, we posit that relational awareness and relational motivation increase the likelihood (Jarzabkowski & Bednarek, 2018) of IORs purposeful use in view of market opportunities seizing.

7.3.2 Hypotheses Development

We follow the analytical model developed by Helfat and Peteraf (2015) to capture the relationship between managerial cognition and organizational-level outcomes. Managerial cognition is a micro-foundation that shapes dynamic managerial capabilities such as sensing, seizing, and reconfiguring. In turn, these individual-level capabilities shape organizational-level strategic change, reflected in opportunity recognition and creation, strategic investment and business model design, or strategic asset alignment.

Consistently with the AMC framework (Chen & Miller, 2015), which involves awareness and motivation to enter either a rivalrous or a relational mode, we focus exclusively on the relational mode in order to rigorously match the scope of IORs. Hence, rather than considering competitive actions number, speed, and diversity as outcomes of behavioral drivers, we focus on actions relative to IORs’ durability and heterogeneity (Figure 9). Instead of acting against others, relationally oriented firms aim at working with others by developing and maintaining IORs to achieve their objectives (Cheng & Sheu, 2012).

Essentially, IORs are instrumental in pursuing market opportunities. Establishing an IOR can yield various benefits, collectively labeled as relational rents (Dyer & Singh, 1998). Firms establish IORs when it is more efficient in terms of costs, or in terms of resource access, to work with others as compared to individual operations by the focal firm (Parmigiani & Rivera-Santos, 2011). This encourages managers to develop relational strategies that may provide a competitive advantage, even if this is a challenging task (Fawcett, Hofer, & Fawcett, 2014). We focus explicitly on IORs' market outcomes that may manifest directly as seizing opportunities (Helfat & Peteraf, 2015). Therefore, we hypothesize that:

Hypothesis (H1a). The higher is managers' relational awareness, the more firms seize market opportunities.

Hypothesis (H1b). The higher is managers' relational motivation, the more firms seize market opportunities.

Furthermore, we hypothesize that market opportunities seizing is mediated by the specific characteristics of the IORs. This assumption matches the fundamental tenet of the AMC framework of competitive dynamics (Chen & Miller, 2015) that awareness and motivation lead to action, which in turn brings outcomes. In the relational mode of interactions, firms establish IORs to jointly pursue opportunities (Figure 9). Prior literature identifies IORs' durability (Rahman & Korn, 2014) and heterogeneity (Corsaro, Cantù, & Tunisini, 2012) as key choices managers make when considering the pursuit of goals with partners. Durability is connected with time, as IORs are not static nor are they established to complete a single transaction, but they are meant to endure over time (Barringer & Harrison, 2000) in an attempt to outcompete rivals working on a transactional logic (Möller & Rajala, 2007). Durability implies a long-term orientation in a relationship (Ritter & Gemünden, 2003) and sustained pursuit of opportunities. Additionally, the formation of IORs depends on the prior history of the relationship between partner firms (Parmigiani & Rivera-Santos, 2011). Time is a key structuring dimension for IORs and involves such elements as change, evolution, or progressive setting of priorities (Lumineau & Oliveira, 2018). As prior literature shows, those IORs, which are oriented at learning and innovation necessary to seize market opportunities, can be of long or short duration (Parmigiani & Rivera-Santos, 2011). IORs are challenging because of tensions that may emerge between partners over time; therefore, successfully addressing tensions over time is seen as a prerequisite for virtuous-circles

leading to successful value creation and value capture (Niesten & Stefan, 2019). Building on this tenet, we hypothesize that:

Hypothesis (H2a). The durability of IORs mediates the relationship between managers' relational awareness and market opportunities seizing.

Hypothesis (H2b). The durability of IORs mediates the relationship between managers' relational motivation and market opportunities seizing.

Relationships maintained by a firm are likely to be numerous, with varied actors. While the level of analysis in IOR research has most often been the dyad (Ring & Van De Ven, 1994), researchers recognize the embeddedness of firms in a complex set of relationships that can be viewed from either a portfolio perspective or a network perspective (Cheng & Sheu, 2012; Möller & Rajala, 2007; Ritter & Gemünden, 2003). When looking from a portfolio perspective, firms use different relationships to pursue different objectives, manage the interconnectedness of the relationships, given the variety of time perspectives, and the diversity of the actors involved (Parmigiani & Rivera-Santos, 2011). For instance, empirical studies suggest that while firms' innovative performance is associated with IORs (Faems, Van Looy, & Debackere, 2005), this association differs depending on the partners involved: for example, suppliers, universities, or competitors (Palumbo & Manna, 2018), making heterogeneity an important factor in innovation development (Zhao, Wei, Xi, & Wang, 2020). Previous studies indicated that vertical collaboration can improve innovation performance (Tsai, 2009) and suggested that managers can pursue opportunities through vertical IORs along the supply chain—by involving suppliers and customers in value creation activities (Czakoń & Kawa, 2018). For instance, the practice of working with suppliers to develop new products is widely advocated, even if not all such endeavors are equally successful (Yan & Dooley, 2014). Vertical relationships can bring both short- and long-term benefits, including successful exploration (Aoki & Wilhelm, 2017), addressing disruptions (Duong & Chong, 2020), or sustainability performance (Lintukangas, Kähkönen, & Hallikas, 2019). Accordingly, we hypothesize that:

Hypothesis (H3a). The supply chain relationships of IORs mediates the relationship between managers' relational awareness and market opportunities seizing.

Hypothesis (H3b). The supply chain relationships of IORs mediates the relationship between managers' relational motivation and market opportunities seizing.

However, IORs are embedded in value networks, a framework introduced to capture the set of actor- and relationship-related options that managers should be considering when shaping their business strategies (Nalebuff & Brandenburger, 1997). The value network suggests that managers can pursue opportunities through vertical IORs along the supply chain, or for horizontal IORs, by involving competitors, or even by involving the producers of complementary goods that increase the value for the end customer (Czakoń & Kawa, 2018). Previous studies have indicated that a behavioral disposition toward working with competitors is associated with product complexity (Czakoń et al., 2020). Similarly, establishing horizontal IORs contributes to higher value for customers reflected in longer overnight stays (Falk, 2017), higher supply chain performance (Rodrigues, Harris, & Mason, 2015), and innovation (Bouncken, Fredrich, Ritala, & Kraus, 2018). Recent empirical studies have indicated that firms can benefit from collaborating with both suppliers and competitors for service innovation, but that product innovation should prioritize establishing IORs with competitors (Markovic et al., 2020). A more complex view suggests that heterogeneous networks yield a higher potential for value creation than simple horizontal or vertical IORs (Möller & Rajala, 2007). Recent studies have suggested that by adopting various modes of interaction, firms may increase their value-creating potential (Wang, Persson, & Huemer, 2016). Therefore, following relationships established in the IOR-innovation literature, we predict that the degree of IOR heterogeneity, especially in value network relationships, is consequential for market outcomes. Therefore, we hypothesize that:

Hypothesis (H4a). The value network relationships of IORs mediates the relationship between managers' relational awareness and market opportunities seizing.

Hypothesis (H4b). The value network relationships of IORs mediates the relationship between managers' relational motivation and market opportunities seizing.

Figure 10 depicts our conceptual model that is a visual representation of our considerations and hypotheses.

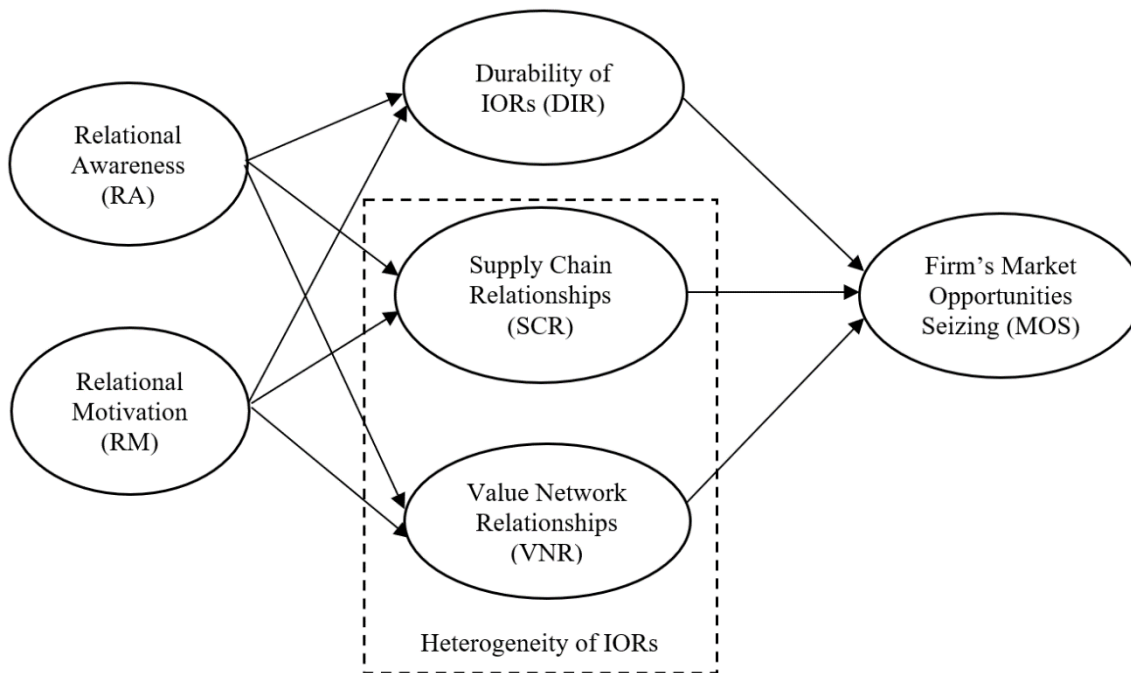


Figure 11: Conceptual model.

7.4 EMPIRICAL RESEARCH DESIGN

To test our hypotheses, we used perceptual data collected through a survey, given that managers' perceptions reflect relational rivalry (Kilduff, 2019). In IOR research, questionnaires are commonly used to measure a variety of phenomena, as evidenced by the meta-analytical studies that combine the results of different quantitative studies (e.g., Chang, Ellinger, Kim, & Franke, 2016; Parmigiani & Rivera-Santos, 2011; Pippel, 2013).

7.4.1 Data Collection

We followed a conventional approach to develop our measurement scale (Churchill, 1979). Given that there are no existing instruments in the literature, we developed and validated our own measurement scales (Danneels, 2016). We used a conventional validation procedure for our scale involving content, face, and construct (both discriminant and convergent) validity as well as a nomological validity (Czakoń et al., 2020) by testing our hypotheses. First, we generated an initial inventory of items useful in capturing relational awareness, relational motivation, durability, and heterogeneity of IORs and market opportunities seizing. The literature-driven (Andersson & Mattsson, 2010; Dyer & Singh, 1998; A. M.; Fawcett et al., 2014; Hardy, Phillips, & Lawrence, 2003; Lavie, 2006; Livengood & Reger, 2010; Ravasi, Tripsas, & Langley, 2020; Rengger, 2015; Ritala & Ellonen, 2010) inventory included 8

items for relational awareness, 8 items for relational motivation, 4 items for IOR durability, 5 items for IOR heterogeneity, and 7 items for market opportunities seizing.

Secondly, we conducted a face validity assessment with expert judges (Hardesty & Bearden, 2004). Experts from the Polish management research community were selected as valuable informants (Kilduff, 2019) by using typical criteria for expert research (Belton, MacDonald, Wright, & Hamlin, 2019; Rowe & Wright, 2001), such as relevant academic publications within the strategic management of IORs or networks and professional experience/activity in this field of interest reflected by research projects and grants. Hence, our experts meet both the criteria of familiarity with theory and knowledge of the empirical setting. The recommended number of experts should range from 15 to 30 for homogenous panels; therefore, we collected inputs from 20 experts (Clayton, 1997). We asked the experts to express opinions on the items describing particular constructs (i.e., the relational awareness, relational motivation, durability, and heterogeneity of inter-organizational relationships as well as the market outcomes of implementing the strategy) in terms of their legitimacy, theoretical validity, and understanding by business practitioners. Moreover, we asked the experts to assess the constructs as a whole, and if any issue was missed in their opinion, we asked them to complete it. Following the expert comments, we modified our measurement scale accordingly: in the formulation and number of items per variable, and developed 10 items for relational awareness, 8 items for relational motivation, 6 items for IOR durability, 7 items for IOR heterogeneity, and 8 items for the market opportunities seizing.

Thirdly, we conducted a pilot test to assess the adequacy of our scales as well as to check its analytical potential (Blessing & Chakrabarti, 2009; Collins, 2018). The research sample was random and included medium-sized firms (i.e., those with 50–249 employees) with operations in Poland. Firms of this size were chosen specifically because they are characterized by a high level of diversity. In this group, both small and large firms' respondents were represented. The respondents were owners or represented the top management. Consequently, we modified the survey based on our pilot test.

The data collection was carried out from December 2018 to May 2019. We used a multi-mode method of data collection that combines two survey techniques in parallel: Computer Assisted Web Interview and Computer Assisted Telephone Interview. This data collection method can yield a much higher quality of data than other survey techniques in terms of precision, accuracy, error rate, reliability, and validity (De Leeuw, 2005). At the beginning

of each interview, respondents were asked to confirm that they are knowledgeable about the firm's strategic issues and asked to indicate whether they are top managers (33.5%) or firm's owners (66.5%) responsible for strategy creation and implementation.

The sample included 400 Polish companies. We used probabilistic stratified random selection (Groves et al., 2011). This method involves dividing a population into homogeneous subgroups, or strata, and then taking a simple random sample in each subgroup. Strata are formed based on the firms' size, i.e., the number of employees. Three subgroups were formed: small (10–49 employees), medium-sized firms (50–249 employees), and large firms (more than 249 employees). Previous studies of inter-organizational relationships and relational strategies have focused on large organizations (e.g., Davis, 2016; Dyer & Chu, 2003), have excluded micro-firms (Connor, Lowry, & Treiblmaier, 2020), or have not considered firm size (Handfield & Bechtel, 2002). We decided to eliminate micro-firms (i.e., with up to 9 employees) from our sample because such entities are characterized by fewer and less complex inter-organizational relationships due to their limited resources, managerial slack, and range of operation (Baumann & Kritikos, 2016; Hanna & Walsh, 2008; Tan & Peng, 2003b). Additionally, the sector (production, services, or retail) and industry of their business activity according to the Polish Classification of Activities code (PKD; "Polish Classification of Activities," 2018) were included to eliminate excessive concentration in one group.

The sampling frame was the database of the National Business Register (REGON) from which the gross sample was obtained. The initial database contained 1856 firms, however, only 400 responses were obtained. The penetration rate was 1:7, and the response rate was 21.5%; this is comparable to other studies concerning inter-organizational relationships, in which the response rate fluctuates from 10% to 30% (Jones, Fawcett, Wallin, Fawcett, & Brewer, 2014; Turker, 2014; Weber & Heidenreich, 2018). The study population was mainly small and medium-sized enterprises that dominate their industries in the Polish economy. Most firms in our sample are mature, i.e., they have been operating in the market for 11–20 years (45.25%) or over 20 years (33.5%) (Figure 11).

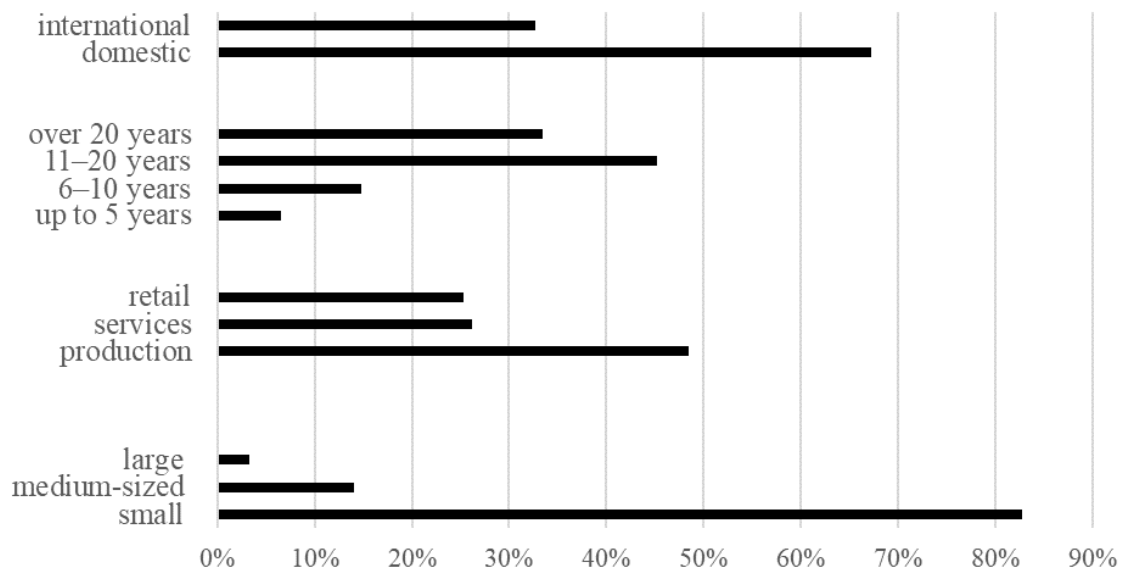


Figure 12: Characteristics of studied companies.

It confirms their experience in forming, developing, or dissolving inter-organizational relationships. In almost half of the firms, activities related to production dominated, and most firms were active in the domestic market (67.25%). The firms represent a broad spectrum of activities, belonging to 14 different PKD groups (Table 33).

<i>Industry, according to the Polish Classification of Activities (PKD)</i>	N	%
Agriculture, forestry, and fishing	11	2.75
Manufacturing	112	28
Construction	57	14.25
Wholesale and retail trade; repair of motor vehicles and motorcycles	100	25
Transportation and storage	18	4.5
Accommodation and food service activities	19	4.75
Information and communication	11	2.75
Real estate activities	12	3
Professional, scientific, and technical activities	22	5.5
Administrative and support service activities	16	4
Others	22	5.5
Total	400	100

Table 33: Company profiles according to Polish Classification of Activities code.

To assess the nonresponse bias, we compared the first and last 25% of the respondents in our sample (Werner, Praxedes, & Kim, 2007). Results of the Mann–Whitney U tests show that the respondents do not differ significantly ($p < 0.05$) in terms of organizational age and size. We concluded that nonresponse bias was not a likely issue in our data.

To minimize the potential common method bias, we employed procedural methods in our data collection. Following Podsakoff, MacKenzie, and Podsakoff (2012) advice, we used multiple-item constructs to capture all the key variables, and we formulated particular items as simple as possible. We also performed confirmatory factor analysis (CFA) for control of an unmeasured latent common method. All these indicate that a common method bias is not a serious problem in our study.

7.4.2 Data Analysis

To address latent variables and measurement error (Antonakis, Bendahan, Jacquart, & Lalive, 2014), we utilized a reflective multiple-indicator-measurement approach. We used a multi-items questionnaire based on a 7-point Likert scale, with responses ranging from 1 (strongly disagree) to 7 (strongly agree). We followed a rigorous procedure to purify and validate the measurement scale items, as advocated by Gerbing and Anderson (1988), and Hair, Black, Babin, and Anderson (2010). We performed exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to assess the unidimensionality of each construct.

First, EFA using principal component analysis for factor extraction and the Varimax technique for factor rotation (Schumacker & Lomax, 2012) was used to check whether our items loaded onto particular latent constructs. This resulted in the extraction of five factors (Table 34). For relational awareness (RA), the Kaiser–Mayer–Olkin (KMO) test value—tested to determine whether the sample size was sufficient—was 0.895, above the threshold of 0.5 (Kaiser, 1974) and greatly exceeding the sample’s constraint condition for factor analysis. The Bartlett sphericity test value was 2922.153 ($df=45$; $p<0.000$), demonstrating that the items are mutually correlated and suitable for the extraction of common factors. Based on the EFA results, we removed five of the ten items, and the remaining five items made up one factor explaining 75% of the variance.

In the case of relational motivation (RM), the KMO test value was 0.890, and the Bartlett sphericity test value was 3035.229 ($df=45$; $p<0.000$). We removed four items, and the remaining four items made up one factor with a proportion of variance explained of 78%. For the durability of inter-organizational relationships (DIR), the KMO test value was 0.816, and the value for Bartlett’s sphericity test was 1862.553 ($df=15$; $p<0.000$). We removed three items, and the remaining three items made up one factor with a proportion of explained variance of 85%.

Items	Component					
	1	2	3	4	5	6
RA1	<i>purified</i> ^a					
RA2	0.744					
RA3	<i>purified</i> ^a					
RA4	0.765					
RA5	0.825					
RA6	0.669					
RA7	0.711					
RM1		0.741				
RM2		0.817				
RM3		0.902				
RM4		<i>purified</i> ^a				
RM5		0.855				
RM6		<i>purified</i> ^a				
DIR1			0.786			
DIR2			0.713			
DIR3			0.741			
DIR4			<i>purified</i> ^a			
SCR1				0.830		
SCR2				0.659		
SCR3				0.796		
VNR1					0.861	
VNR2					0.897	
VNR3					0.787	
MOS1						0.870
MOS2						0.868
MOS3						0.729

Table 34: Results of exploratory factor analysis (EFA).

Note: Coefficients below 0.4 were suppressed.

^a Items were purified, based on cross-loadings.

For the heterogeneity of the IORs, the KMO test value was 0.717, and the value for Bartlett’s sphericity test was 1758.498 (df=21; p<0.000). The EFA resulted in the extraction of two factors in this case, and one item was removed. We named the first factor supply chain relationships (SCR; AVE=0.853) and the second one value network relationships (VNR; AVE=0.755). Both factors consist of three items. For market opportunities seizing (MOS), the KMO test value was 0.654 and the value for Bartlett’s sphericity test was 2492.278 (df=28; p<0.000). We removed five items, and the remaining three items made up one factor with a cumulative variance of 82%. All extracted factors were found to have eigenvalues greater than 1.0 with loadings greater than 0.7.

Next, we conducted a confirmatory factor analysis (CFA) separately for each construct to check whether the items were correctly grouped to assess the discriminant validity of our scale and assess the validity and reliability of the constructs. All factor loadings for the

underlying constructs were significant ($p < 0.001$), and the overall model fits the data satisfactorily: $\chi^2(350) = 853.441$; the goodness of fit index (GFI) was 0.900; the comparative fit index (CFI) was 0.912; the Tucker–Lewis index (TLI) was 0.902; and the root mean square error of approximation index (RMSEA) was 0.061 (Gerbing & Anderson, 1988; Harrington, 2009). Our results confirm the unidimensionality of each construct.

We also used CFA to test the convergent and discriminant validity of the study scales. The convergent validity was assessed by standardized path loadings, which should be greater than 0.7 and statistically significant (Gefen, Straub, & Boudreau, 2000), and the average variance extracted (AVE) for each factor, which should exceed 0.50 (Bagozzi & Yi, 1988). All factor loadings for the constructs were close to 0.70 or higher ($p < 0.001$) with cross-loadings below 0.40 and AVE values higher than 0.50. Consequently, the convergent validity of the constructs was supported. Further, we performed a test for discriminant validity and found that the square roots of the AVE along the diagonal of the correlation matrix were greater than all other entries in the same row and column (Table 35), which satisfies the criterion of discriminant validity (Fornell & Larcker, 1981; Hair et al., 2010; Henseler, Ringle, & Sarstedt, 2015).

No	Variables	1	2	3	4	5	6
1	Relational Awareness (RA)	0.867					
2	Relational Motivation (RM)	0.866	0.886				
3	Durability of IOR (DIR)	0.718	0.684	0.925			
4	Supply Chain Relationships (SCR)	0.787	0.757	0.717	0.923		
5	Value Network Relationships (VNR)	0.265	0.207	0.204	0.327	0.868	
6	Market Opportunities Seizing (MOS)	0.706	0.652	0.610	0.656	0.163	0.905
	Mean	5.46	5.21	4.98	4.92	3.17	4.98
	s. d.	0.961	1.124	1.179	1.004	1.045	1.129

Table 35: Descriptive statistics, correlations, and values of discriminant validity.

Note: N = 400; s. d. – standard deviation; Correlations greater than 0.145 are statistically significant at $p < 0.01$; the diagonal values (in bold) present the square roots of AVE.

Finally, we used Cronbach’s alpha and composite reliability (CR), which allowed us to test the reliability of each latent construct. In all cases, the values for Cronbach’s alpha were above 0.70, suggesting good reliability. Similarly, the CR values were all above the recommended minimum level of 0.70 (Fornell & Larcker, 1981). The variables we studied, with measurement items, factor loadings, convergent validity, and reliability assessment are presented in Appendix (Table 36). To test for omitted variables, we added several control variables to our model. We controlled for company size and age, as these measures might be

expected to influence the extent to which opportunities are seized (Baumann & Kritikos, 2016; Hanna & Walsh, 2008; Saemundsson & Candi, 2017; Tan & Peng, 2003a). We controlled for firm's capital (domestic=0 and foreign=1), as firms with international capital structure pursue different objectives than those with domestic capital structure and accordingly we assume an effect on opportunity seizing, which we consider in our model. Furthermore, we controlled for market (local=0 and global=1) and sector (manufacturing, services, retail) of the companies, as these measures determine the framework in which the companies can identify and consequently seize opportunities. Because the extent to which opportunities are seized is determined whether a company operates locally or globally or produces or fulfils a service. Finally, we controlled for the environment (predictable=0; unpredictable=1), because uncertainty and unpredictability about possible dynamics in the environment significantly influence the extent to which opportunities are seized (Saemundsson & Candi, 2017).

We used structural equation modeling (SEM) that offers the advantage of flexibility in matching the theoretical model with the data and allows the description of unobservable latent variables (Hirschmann & Swoboda, 2017; Martínez-López et al., 2013). First, we assessed whether the durability (DRI) and heterogeneity of the IORs, as expressed by the supply chain relationships (SCR) and value network relationships (VNR), are moderators or mediators. We performed several SEM models tests of DRI, SCR, and VNR moderating relationship between the relational awareness (RA) and relational motivation (RM), and the firm's market opportunities seizing (MOS). The models' fit was unsatisfactory, and most of the dependency paths were insignificant ($p > 0.05$), which confirms that DRI, SCR, and VNR are not moderators, but mediators. Therefore, we built one SEM model to check all path dependencies. We employed two statistical packages to conduct the statistical tests: Statistica and Amos.

7.5 RESULTS

The descriptive statistics of latent constructs, correlations, and the discriminant validity test are reported in Table 35. All correlations are significant ($p < 0.01$) and positive.

To test our hypotheses and analyze the mediation effect of DIR, SCR, and VNR based on empirical data, we used SEM with maximum likelihood (ML) estimation and covariance matrix as data inputs. The ML estimation method is often indicated as well suited to theory testing and development (Schumacker & Lomax, 2012). The final SEM model is presented

in Table 36 and Table 37. In Table 36, the direct effects between independent variables, mediators, and dependent variables are shown; in Table 37, the mediation (indirect) effects between independent and dependent variables are introduced. The model fit statistics were satisfactory: $\chi^2(294)=867.74$; GFI=0.908; CFI=0.913; TLI=0.907; and RMSEA=0.058.

	Durability of Inter- organizational Relationships (DIR)	Supply Chain Relationships (SCR)	Value Network Relationships (VNR)	Market Opportunities Seizing (MOS)
<i>Control variables</i>				
Company Size	0.087 (0.032) p<0.01	0.013 (0.029) p=0.659	0.164 (0.048) p<0.001	-0.104 (0.035) p<0.01
Capital (domestic, foreign)	-0.014 (0.032) p=0.654	0.012 (0.028) p=0.657	0.001 (0.047) p=0.970	0.001 (0.034) p=0.820
Market (local, global)	0.018 (0.033) p=0.578	0.001 (0.028) p=0.978	0.070 (0.047) p=0.142	0.058 (0.034) p<0.1
Sector (production, services, retail)	0.061 (0.033) p<0.1	0.001 (0.028) p=0.880	0.031 (0.047) p=0.506	-0.079 (0.034) p<0.05
Environment (predictable, unpredictable)	0.021 (0.032) p=0.509	-0.041 (0.028) p=0.156	-0.013 (0.047) p=0.782	0.010 (0.034) p=0.752
Company age	0.038 (0.032) p=0.238	0.001 (0.018) p=0.882	0.018 (0.047) p=0.705	0.038 (0.034) p=0.265
<i>Independent variables</i>				
Relational Awareness (RA)	0.286 (0.071) p<0.001	0.342 (0.060) p<0.001	0.137 (0.105) p=0.193	0.399 (0.076) p<0.001
Relational Motivation (RM)	0.164 (0.067) p<0.05	0.243 (0.057) p<0.001	-0.127 (0.098) p=0.197	0.026 (0.071) p=0.708
Durability of Interorganizational Relationships (DIR)		0.275 (0.041) p<0.001	-0.103 (0.073) p=0.159	0.161 (0.053) p<0.01
Supply Chain Relationships (SCR)	0.369 (0.055) p<0.001		0.350 (0.082) p<0.001	0.223 (0.061) p<0.001
Value Network Relationships (VNR)	-0.049 (0.035) p=0.159	0.125 (0.029) p<0.001		-0.039 (0.036) p=0.285
R ²	0.583	0.688	0.128	0.544

Table 36: Direct effect between controls, independent variables, mediators, and dependent variables.

Note: SEs in parentheses; p-value on third row

Mediators	Dependent variable Market Opportunities Seizing (MOS)	Mediation type ^a
Independent variable – Relational Awareness (RA)		
<i>Single Mediator</i>		
DIR	0.046 p<0.05	complementary
SCR	0.076 p<0.01	complementary
VNR	-	direct-only
<i>Double Mediator^b</i>		
DIR→SCR	0.018 p<0.01	
SCR → DIR	0.020 p<0.01	
Independent variable - Relational Motivation (RM)		
<i>Single Mediator</i>		
DIR	0.026 p<0.05	indirect-only
SCR	0.054 p<0.01	indirect-only
VNR	-	no effect nonmediation
<i>Double Mediator^b</i>		
DIR→SCR	0.010 p<0.05	
SCR → DIR	0.014 p<0.05	

Table 37: Indirect effect (mediation) between independent variables and dependent variables.

Note: p-value in second row

^a Typology according to Zhao, Lynch & Chen, 2010

^b Only significant double mediations are provided

The manager's relational awareness is significantly associated with market opportunities seizing (H1a: $\gamma=0.399$; $p<0.001$), supporting Hypothesis H1a. This implies that the more managers are aware of opportunities and benefits available through IORs, the more they seize market opportunities. However, we do not find support for H1b ($\gamma=0.026$; $p=0.708$), thus rejecting our hypothesis that the manager's relational motivation positively and significantly relates to market opportunities seizing. Hypothesis H2a, which predicts a mediating role of IOR durability between managers' relational awareness and firms' market outcomes expressed by market opportunities seizing, is supported. DIR mediates this relationship ($\gamma=0.046$; $p<0.05$) with a total effect of 0.433, indicating a complimentary mediation (Zhao, Lynch, & Chen, 2010). Regarding the relationship between managers'

relational motivation and firms' market outcomes (H2b), DIR also mediates this relationship ($\gamma=0.026$; $p<0.05$), resulting in an indirect-only mediation (Zhao et al., 2010). Our results show that the more managers are aware of the benefits achieved through collaboration and the higher their relational motivation is, the more durable are the IORs they develop and the more market opportunities they seize.

The heterogeneity of IORs was determined by two factors (SCR and VNR). Hypotheses H3a and H3b that postulated SCR as a mediator were confirmed. Accordingly, SCR mediates the relationship between managers' relational awareness and firms' opportunities seizing (H3a: $\gamma=0.076$; $p<0.01$), resulting in a complementary mediation (Zhao et al., 2010). Furthermore, SCR mediates the relationship between managers' relational motivation and firms' opportunities seizing (H3b: $\gamma=0.054$; $p<0.01$), indicating an indirect-only mediation (Zhao et al., 2010). However, hypotheses H4a and H4b were both rejected, indicating that heterogeneity expressed by value network relationships was insignificant as a mediator for the relationship between managers' relational awareness and firms' opportunities seizing, and the relationship between managers' relational motivation and firms' opportunities seizing. Therefore, for H4a, there is a direct-only effect and for H4b no effect nonmediation (Zhao et al., 2010). Our results are presented in Figure 12.

This shows that a stronger relational awareness and relational motivation result in higher heterogeneity of IORs, but only for those with suppliers and customers. Managers' relational awareness and relational motivation had no impact on the heterogeneity of relationships within a value network, in which the IORs are more complex and multilateral. Therefore, we then tested the mediation effects by employing DIR, SCR, and VNR as double mediators (Table 37). It should be noted that in SEM, a direct relationship between the independent variable and the dependent variable is not expected when testing mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). However, when we took durability and heterogeneity expressed by supply chain relationships together to test their mediating role in the relationships between RA and MOS (DIR \rightarrow SCR: $\gamma=0.018$; $p<0.01$; SCR \rightarrow DIR: $\gamma=0.020$; $p<0.01$) and between RM and MOS (DIR \rightarrow SCR: $\gamma=0.010$; $p<0.05$; SCR \rightarrow DIR: $\gamma=0.014$; $p<0.05$), the path dependencies were significant.

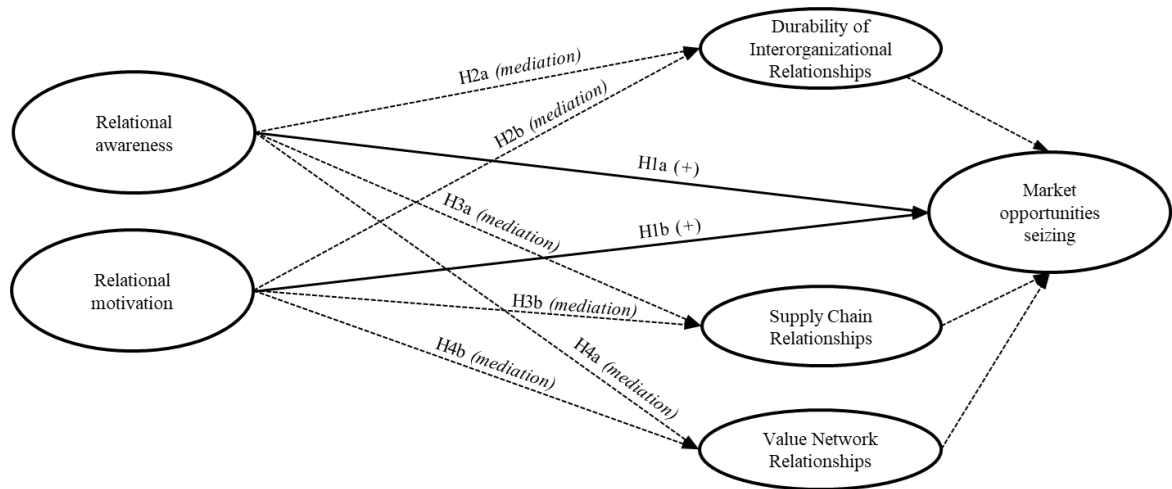


Figure 13: Tested model.

7.6. DISCUSSION

The objective of our study was to examine the impact of relational awareness and relational motivation on opportunities seizing. In doing so, we tested a set of hypotheses to find full or partial support for some of the hypothesized relationships.

Firstly, our study contributes to filling a conceptual gap in relational competing understanding by deriving the relational awareness and relational motivation constructs as behavioral drivers of relational modes of firms' interactions. In line with the original, rivalry-oriented definition of competition behavioral drivers (Chen, 1996) which identified only rivals, we add a relational dimension to incorporate prospective partners in the analysis. To our best knowledge, our study is the first to formally define the relational awareness and relational motivation constructs, empirically examine managers with regard to these constructs, and substantiate these constructs' relevance for strategic action. In doing so, we conceptually invigorate the development of relational competition (Jarzabkowski & Bednarek, 2018). Our results show that managers vary in terms of relational awareness and motivation, but while awareness matters for market opportunity seizing, relational motivation does not. This supports prior findings that managers develop their own representations of IORs surrounding the firm (Abrahamsen et al., 2012). Their perception of networks is incomplete (Knoben, Gilsing, & Krijkamp, 2019), which makes managers network-myopic to varying degrees (Czakoń & Kawa, 2018) and in turn able to seize market opportunities to varying degrees.

Secondly, we have demonstrated that IORs are instrumental in pursuing market opportunities. Our results show that depending on managers' relational awareness and motivation, IORs exploited by firms are durable and heterogeneous to varying degrees, and they mediate the relationship between relational awareness and relational motivation with market opportunities seizing.

Our study results are in line with theoretical claims based on game theory (Parkhe, 1993) that the pursuit of collaborative benefits (Barringer & Harrison, 2000) requires durable i.e. long-term—relationships. The more managers relationally aware are, the more durable are the IORs that they establish. This association also holds for relational motivation. Time is a key structuring element in IOR research (Lumineau & Oliveira, 2018) because relationships evolve in order to effectively reach the objectives of involved firms. While these theoretical claims are established in the literature, our study substantiates that IOR durability mediates between relational awareness as well as relational motivation, and market opportunities seizing. In other words, those managers who establish and maintain durable IORs are more likely to seize market opportunities than those who do not. We thus bridge the stream of research focused on managerial cognition (Helfat & Peteraf, 2015) with the stream focused on time (Aguinis & Bakker, 2021). While research on role of time perceptions and speed in competitive actions is emerging (Nadkarni, Chen, & Chen, 2016), our study adds that time matters also for relational modes of interaction. However, it matters in a different way because instead of speedy addressing competitive threats in a competitive logic, the relational logic favors durability in reaching out for market opportunities.

Interestingly, relational awareness and relational motivation are associated with IORs' heterogeneity only with regard to the supply chain firms. Despite normative claims that managers can better seize value creation opportunities by engaging with various actors in the value network (Nalebuff & Brandenburger, 1997) our results show a clear preference for working with supply chain partners, rather than the wider value network. These findings are coherent with prior studies suggesting that managers are more aware of their supply chain relationships and remain network myopic with regard to other potential partners (Czakoń & Kawa, 2018). Despite recent examples of increased activity in jointly pursuing market opportunities (Druehl et al., 2021), our data indicate that managers largely fail to perceive all network actors and attribute various degrees of usefulness to IORs, depending on whether these relationships are vertical (supply-chain-related), horizontal (competitors), or other

(with other actors) in the pursuit of market opportunities. One explanation might be that across the study population, networks are important to varying degrees, thus making some managers more open to value networks while many others are somehow stuck in supply chains perceptions. Another explanation might be that the value network (Brandenburger, Nalebuff, 1996) remains mainly a theoretical proposition, which requires a long time and effort to spread across firms in their strategic behaviors. Nonetheless, our results are not in line with prior literature suggesting that horizontal relationships foster innovation (Bouncken et al., 2018) and can be beneficial for performance if effectively managed (Le Roy & Czakon, 2016). Therefore, a third explanation might be that market opportunities seizing is a dependent variable substantially different as compared to performance measures used so far in the literature.

Thirdly, by adopting a cognitive perspective (Helfat & Peteraf, 2015), we link the behavioral drivers of relational modes of firms' interactions with opportunities seizing, one of the key components of dynamic capabilities. In this view, managerial cognition is related to dynamic capabilities such as opportunity sensing and seizing, and resource reconfiguring. Our results provide an empirical test that supports the conceptual association of relevant managerial cognition factors: relational awareness and relational motivation with market opportunities seizing. This suggests that IORs are indeed instrumental in pursuing a particular goal with partners that are embedded in the firm's supply chain. By testing the mediation relationship that durable IORs display between relational awareness, relational motivation, and market opportunities seizing we substantiate that managers seem to prefer the pursuit of opportunities with their "old guards" rather than looking for new partners. Additionally, we find that supply chain relationships play a mediation role, which even strengthens the view that "old guards" are seen as valuable. At the same time, looking for partners within the broad value chain did not appear to play a significant role, which suggests that in the pursuit of market opportunities, "new friends" are not seen as a valid option by managers.

7.7 CONCLUSION

Our study responds to recent calls for research on the relational architecture of markets (Sonenshein et al., 2017) and on the relational modes of interaction (Chen & Miller, 2015). If competitive dynamics needed extension to incorporate actions other than rivalry, in the pursuit of goals other than value appropriation, then the behavioral drivers of strategic action also need further conceptual and empirical development (Chen & Miller, 2015).

7.7.1 Theoretical Implications

Our results have important implications for several streams of strategy literature. First, we addressed the conceptual and empirical gaps that emerged in the competitive dynamics literature when it was extended from a uniquely rivalrous mode of interaction to incorporate the relational mode of interaction (Chen, Michel, & Lin, 2021). The behavioral framework useful in predicting the likelihood of a competitive attack or response aims essentially at value appropriation, leaving value creation with others beyond the scope of attention (Chen & Miller, 2015). We contribute to filling this gap by introducing behavioral drivers of market opportunity seizing: relational motivation and relational awareness. Second, we contribute to the IOR literature by examining their key characteristics. Our study suggests that they are important for market opportunities seizing through durable IORs maintained with suppliers and customers. Third, we contribute to the literature on coopetition by establishing that establishing and maintaining heterogeneous IORs with value network partners is not perceived as relevant for market opportunities seizing.

7.7.2 Managerial Implications

Our study substantiates the role of relational strategies in reaching out for market opportunities. It is important to design and implement relational strategies through durable IORs with supply chain partners in view of seizing market opportunities. Indeed, relational strategies complement the competitive approach managers typically adopt. While competition refers mainly to threats, while IORs refer to opportunities. We encourage the managers to develop relational strategies and to purposefully use IORs to seize market opportunities. Relational awareness and relational motivation are behavioral drivers for relational strategies; therefore, it is important for managers to pay attention to those drivers.

At the same time, traditional thinking about firms being embedded in supply chains prevails over value-network thinking. Our study substantiates that managers underestimate the opportunities embedded in value networks. There is potential for value creation that managers systematically fail to notice and do not attribute relevance to. A blind spot in opportunities seizing emerges, because potentially useful partnerships remain out of managers' attention. We emphasize that during the recent COVID-19 vaccine race, an increased partnering activity between various actors has been observed by the World Health Organization (Druehdahl et al., 2021) and that the globally successful vaccine has been developed by competitors working together. Therefore, we encourage managers to expand

their perception of business surroundings towards various actors other than immediate links in the value chain. This may involve competitors and complementors in various forms of collaboration.

7.7.3 Limitations and Future Research Agenda

We believe that the behavioral stream of strategy research offers tremendous opportunities for a more realistic theory of what managers choose to do as well as why and when. Our understanding of relational awareness and relational motivation are general, that is, we embrace possible partnering even with unknown partners. However, the original AMC framework was designed to explain competitive dynamics toward a given target firm. This limitation of our conceptual take on relational awareness and motivation opens avenues for developing those concepts and deriving a targeted potential for partnering from prior literature on partner fit.

For parsimony reasons, we focused our research on relational motivation and relational awareness only, leaving out the competitive behavioral drivers. By extending the scope of these behavioral drivers, we open avenues for further scrutiny. One line of research may seek to integrate competitive awareness and motivation, with relational awareness and motivation. A further step might seek to explore how managers navigate the two modes of interaction to better understand the strategic behavior of firms. We encourage further research on relational awareness and relational motivation behavioral drivers.

Another line of research may explore the link between relational awareness and relational motivation with dynamic capabilities. While our study established associations between relational awareness and relational motivation with opportunities seizing, additional research may explore these associations with opportunities sensing and resource reconfiguration. Thus, our study might be extended toward incorporating the third component of the AMC framework, which is capability to partner.

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7.9 APPENDIX

Latent Variable/Items		Loading	Convergent validity	Reliability
<i>Independent variables</i>				
<i>Relational Awareness (RA)</i>				
RA1	Inter-organizational relationships influence the firms' competitive advantage	0.931	AVE = 0.723	$\alpha = 0.946$ CR = 0.947
RA2	Inter-organizational relationships allow managers to sensing more opportunities in the environment.	0.931		
RA3	Inter-organizational relationships support the seizing of opportunities in the marketplace.	0.883		
RA4	Relationships with suppliers are a source of additional benefits, e.g., better access to resources, cost reduction, access to new markets, mutual learning, etc.	0.804		
RA5	Relationships with customers are a source of additional related benefits.	0.754		
RA6	Relationships with other entities (e.g., R&D units, trade organizations, social and financial organizations, etc.) are a source of additional benefits.	0.761		
RA7	Indirect relationships (the partners of our partners) are a source of additional benefits.	0.864		
<i>Relational Motivation (RM)</i>				
RM1	We monitor the expectations and intentions of our suppliers.	0.693	AVE = 0.774	$\alpha = 0.949$ CR = 0.953
RM2	We monitor the expectations and intentions of our customers.	0.771		
RM3	Our strategy takes into account the expectations of key partners (the most important to us) who we collaborate with.	0.946		
RM4	Our individual goals for collaboration with various entities are clearly defined.	0.962		
RM5	Common goals for collaboration with various entities are clearly defined.	0.951		
RM6	Together with our partners, we achieve goals/processes that we could not accomplish by ourselves at the same level of quality.	0.920		
<i>Mediators</i>				
<i>Durability of Inter-organizational Relationships (DIR)</i>				
DIR1	Our strategy includes only long-term relationships.	0.842	AVE = 0.788	$\alpha = 0.933$ CR = 0.93
DIR2	Our strategy includes relationships in which our trust in the partner is high.	0.923		
DIR3	Our strategy includes relationships in which the partner shows commitment to cooperation.	0.909		
DIR4	Our strategy includes relationships from which we benefit.	0.875		
<i>Supply Chain Relationships (SCR)</i>				
SCR1	Our strategy includes relationships with many entities (not only the key ones for us).	0.945	AVE = 0.799	$\alpha = 0.911$ CR = 0.922
SCR2	Our strategy includes relationships with suppliers.	0.740		
SCR3	Our strategy includes relationships with customers.	0.979		
<i>Value Network Relationships (VNR)</i>				
VNR1	Our strategy includes relationships with various types of partners who we cooperate with.	0.845	AVE = 0.652	$\alpha = 0.835$ CR = 0.846
VNR2	Our strategy includes various forms of relationships (e.g., consortia, clusters, franchises, outsourcing).	0.905		

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VRN3	Our strategy includes indirect relationships, i.e. the partners of our partners.	0.651
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Dependent variables

Market Reputation (MR)

MR1	Our strategy results in improving the firm's image.	0.881	AVE =	$\alpha = 0.809$
MR2	Our strategy results in strengthening our market position.	0.934	0.651	CR = 0.843
MR3	Our strategy results in increased flexibility of our activities.	0.748		

Market Opportunities Seizing (MOS)

MOS1	Our strategy results in access to new markets/customers.	0.965	AVE =	$\alpha = 0.887$
MOS2	Our strategy results in access to new contractors (new partners).	0.968	0.778	CR = 0.908
MOS3	Our strategy results in better seizing of market opportunities.	0.772		

Table 38: Factor loadings, convergent validity, and reliability assessment of latent variables.

Note: AVE – Average variance extracted; α – Cronbach's alpha; CR – Composite reliability

8 CONCLUSION

8.1 SUMMARY AND CONTRIBUTIONS TO THEORY AND IMPLICATIONS FOR PRACTICE

The objective of this thesis is, on the one hand, to identify the phenomenon of coworking as an organizational concept that is highly fluid and flexible (Dobusch & Schoeneborn, 2015; Schreyögg & Sydow, 2010) in nature and embedded in the New Work context (Bergmann, 2019). In this vein, this thesis explores the duality between fluidity and stability in post-bureaucratic organizations by examining the stability-promoting structures and processes in coworking-spaces. Further, it answers the research question of which structures and processes can be used at which level to reconcile fluidity and stability.

On the other hand, this thesis considerably expands the knowledge about coworking-spaces for theory and practice by identifying novel relevant factors as well as combining them in deductive quantitative-empirical studies. Thus, these contribute to a better understanding and identification of research gaps for future research avenues. Therefore, the theoretical implications are numerous, as the presented papers contribute to the overarching theme of researching structures and processes of fluid post-bureaucratic organizations and provide specific insights for different research streams rooted in different theoretical backgrounds. These findings contribute to the research streams of organizational development, strategy, entrepreneurship, and innovation. Additionally, the presented papers offer practical implications for providers of coworking-spaces as well as for companies that have adopted coworking-like structures or are planning to do so. Furthermore and more generally, relevant implications can also be drawn for any fluid form of organization.

The legacy of human history reaches back to Ancient Greece (Plato, 1921), and the research of the last 20 years revealed that, especially in the light of an increasingly dynamic world (Autio et al., 2021; Hanelt et al., 2021; Kellogg et al., 2006), contemporary organizations need to constantly adapt and be open for change – then nothing endures but change (Plato, 1921). Modern post-bureaucratic organizations exhibit greater liquidity or fluidity and are developing structures and processes that are characterised by low formality, low authority, and low bureaucracy (Schreyögg & Sydow, 2010; Weber, 1947), enabling horizontal participation and improvisation (Pesch et al., 2021; Kellogg et al., 2006). Nevertheless, fluid organizations face instability based on fewer rules, less fixed structures, or less hierarchy, indicating that structures and processes are necessary to create stability (Dobusch &

Schoeneborn, 2015; Schreyögg & Sydow, 2010). Fluidity and stability are mutually enabling and thus form a duality (Pesch et al., 2021; Aroles & McLean, 2016; Farjoun, 2010). Therefore, it is essential for fluid organizations that structures and processes can be flexibly implemented to achieve a context-related balance between stability and fluidity, ensuring the organization's performance and productivity.

Generally to the proposed research question, the thesis provides in its first article (Chapter 2; Bouncken & Gantert, 2021) a conceptual model that embeds coworking in the New Work context, identifies coworking per se as a concept while addressing its strengths and challenges for implementation in organizations, and thus enabling coworking-spaces to be viewed as a fluid form of organizations. The second article (Chapter 3; Bouncken et al., 2023) is a qualitative study that seeks to identify the structural as well as procedural aspects of coworking-spaces that provide stability in the otherwise fluid organizational structure. Building on these insights, articles three (Chapter 4; Bouncken et al., 2024) and four (Chapter 5; Gantert et al., 2022) both utilize deductive-quantitative methodologies to gain findings into the stability through structure aspect. These aspects include spatial design, narratives, values, rules, and regulations used by coworking-space providers. Lastly, articles five (Chapter 6; Kopplin et al., 2022) and six (Chapter 7; Zakrzewska-Bielawska et al., 2022) focus on the stability through processes aspect, also using deductive-quantitative research designs. They examine the role of digital technologies, their acceptance in coworking-spaces, as well as relational awareness and relational motivation among collaborators, in contributing to stability in fluid organizational environments through fostering social processes, like the sense of community (Bouncken et al., 2024; Bouncken & Gantert, 2023; Garrett et al., 2017). Conclusively, fluid organizations have several opportunities to implement stability-enhancing structures and processes that do not contradict their fluid nature but enable their fluidity to remain flexible in the flux of change.

More specifically, this thesis also provides deeper insights into the coworking phenomenon per se.

First, by providing a conceptual model that identifies coworking as an organizational concept while addressing its strengths and challenges for implementation in organizations, thus enabling coworking-spaces to be viewed as a fluid form of organizations. In the course of the article, alongside the new theoretical concept of hybrid multi-local work, the article also provides concrete implementation options of hybrid multilocal work and coworking-like

structures for SMEs (Bouncken & Gantert, 2021). The article distinguishes between three different design levels for implementation: the functional level, the cultural level, and the creative level. On the functional level, SMEs should adapt their structures to more flexibility and responsibility of employees, combined with decentralisation and power distribution. Nevertheless, SMEs should also introduce formal rules which regulate the processes at work and ensure a certain level of productivity (Bouncken & Gantert, 2021; Kossek et al., 2010). As a result of the changes at the functional level, SMEs should also adopt common values, norms, and attitudes – on the cultural level – with regard to their requirements and needs (Schönebeck & Kratzer, 2010; Schein, 1984). However, also the workplaces should be designed appropriately – on the creative level – by adapting concepts similar to coworking (Bouncken & Gantert, 2021).

Second, an inductive qualitative study was used to identify coworking-spaces' structural and procedural aspects that contribute to a stabilizing effect of the otherwise fluid organizational structure. In this vein, propagated logics and identity-claims, as in narratives or interior design, which build on basic assumptions and values and manifest themselves in behavioral guidelines, provide structural and processual stability in an otherwise fluid setting. Further, this second study revealed that factors influence the relationship between sustainability and knowledge transfer in coworking-spaces. Significantly, according to the diversity of coworking-space users and whether the sustainability logics are propagated, knowledge transfer differs in coworking-spaces (Bouncken et al., 2023). These findings extend knowledge creation theory (Nonaka & Toyama, 2003; Nonaka & Takeuchi, 1995) and theory about sociomateriality (Bouncken et al., 2021; Orlikowski & Scott, 2008).

Third, within a sample of 317 entrepreneurs who work from coworking-spaces, this article contributes to the stability through the structure aspect by identifying narratives, values, rules, and regulations by coworking-space providers as relevant factors. Moreover, this article also theorizes and tests relationships between these stability-enforcing structural factors (narratives and social identity) and the sense of community as well as the growth of new ventures (Bouncken et al., 2024). This study contributes to theory dealing with aligning founder identity with context. It shows that an integration of sociological and psychological identity theories is needed, where we do not focus on the individual or the environment solely but examine the whole person-environment dynamics by considering the simultaneous influence (Fox et al., 2021).

Fourth, to better understand the possible combinations of different relevant factors in coworking-spaces, the fourth study aimed to use a neo-configurational research design to identify recipes that lead to the desired outcome of the dependent variable. This study identified the moral foundations and corporate social responsibility within spaces as an unconventional source of innovation, especially for large user groups that would be constrained in their performance if the provider did not provide stabilizing factors. Further, this study shows how users' innovativeness can improve through various configurations but is not dependent on necessary condition (Gantert et al., 2022). This article expands the understanding of how innovativeness can be fostered in modern post-bureaucratic organizations and contributes to entrepreneurship research (Bouncken et al., 2021; Bouncken et al., 2018) and innovation research (Svensson & Hartmann, 2018; Cabral & Van Winden, 2016) in particular.

Fifth, to shed light on coworking-spaces' processes that give users a sense of stability, the fifth article provides insights into the usage and acceptance of matchmaking tools in coworking-spaces. In more detail, matchmaking tools are appropriate instruments to connect users in a flexible and fluid organizational work context. In this vein, matchmaking tools simplify forming teams within coworking-spaces and ensure greater stability. Significantly, when users are focused on their productivity, the acceptance of matchmaking tools is increased, as well as when users follow a hedonic motivation or show a high level of personal innovativeness. From a practical perspective, coworkers are willing to use matchmaking tools in their daily activities, primarily influenced by utilitarian factors and hedonic motivation. Satisfaction with offline events, such as workshops or pitch sessions, does not affect their view of matchmaking tools, suggesting that physical and digital activities complement each other rather than substitute one another. Coworking-space providers should facilitate this by offering accessible, up-to-date member databases that can be analysed with matchmaking tools and support simple queries about coworkers' activities and presence. Thus, matchmaking tools are valuable additions to coworking-spaces alongside physical social events (Kopplin et al., 2022). This paper extends the research on matchmaking tools and their use in coworking-spaces (Kopplin, 2021) but also complements the research in the context of knowledge sharing and knowledge combination through the sense of community and knowledge exchange (Garrett et al., 2017; Waters-Lynch & Potts, 2017), which in turn is supported by technology (Venkatesh et al., 2012).

Sixth, the last paper in this thesis provides insights into how relational awareness and relational motivation affect the durability and heterogeneity of relationships that managers build to seize market opportunities (Zakrzewska-Bielawska et al., 2022). In particular, relational awareness and relational motivation point to the processual aspect of coworking-spaces, which reduces uncertainty due to fluidity and flexibility in team formation through stability and ensures longer and more diverse relationships.

Both the specific contributions of the individual studies and their contribution to the overarching research question of the duality between fluidity and stability in modern post-bureaucratic organizations have their implications for research and practice and thus make a significant contribution to further research into fluid organizations as well as research into coworking-spaces in particular.

8.2 LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

This thesis, with its various studies, combines different theoretical backgrounds and different data to gain comprehensive findings from the coworking-space context and to transfer these to the overarching framework of fluid forms of organization. Despite its numerous contributions, limitations remain, providing avenues for future research.

This thesis contains initial studies examining coworking-spaces in the context of fluid organizations and New Work (Bergmann, 2019; Dobusch & Schoeneborn, 2015; Schreyögg & Sydow, 2010). This thesis generally contributes to the research question of which structural and procedural factors can be applied in modern post-bureaucratic organizations to achieve a certain balance between fluidity and stability. However, further research is required to identify additional prevailing causal relationships in this context. This thesis marks the first consolidated research on this novel subject, suggesting that future studies should delve deeper into the dynamics between fluidity and stability. Nuanced research might contribute to how different stabilization factors jointly contribute to balancing fluidity and stability and identify context-specific solutions. This thesis approaches the research question from different theoretical perspectives to gain coherent insights and adequately answer the stated research question. Further research might also draw on this and gain further insights by considering other theoretical perspectives. Fundamentally, this thesis aims to gain insights into coworking-spaces, a sufficiently large field for research (Statista, 2023)

that generally applies to various forms of fluid organizations. Despite the overall generalizability of the findings of this thesis, there are limitations due to differences among fluid organizations. Future research should systematically analyze other fluid organizational forms to identify specific stability factors for fluidity in these contexts.

A significant portion of the empirical-quantitative data in this thesis originates from Europe, potentially limiting its applicability to coworking-spaces outside Europe. However, the worldwide enthusiasm for coworking and the initial spread of a uniform coworking-concept through globalization reveals many still prevailing parallels supporting the findings' generalizability (Bouncken & Reuschl, 2018). Nevertheless, future research should address this and extend the research to other regions to verify the previously identified factors. In this course, panel dataset-theoretic research could better reveal the temporal ordering and dynamics and help to circumvent any weaknesses in small sample sizes (Gantert et al., 2022; Castro & Arino, 2016).

As research into coworking-spaces is still relatively new, the studies in this thesis did not further differentiate between different coworking-spaces subcategories. Neither whether they are coworking-spaces by labels such as FabLabs, makerspaces, hackerspaces, or DIY-laboratories, nor categories by type of coworking-space or other differentiating criteria such as country versus city or general coworking-space versus coworking-space with a thematic focus. Therefore, the results for distinct subcategories might be different (e.g., Gantert et al., 2022). Future research should focus on this and further differentiate and systematize the abundance of coworking-spaces and their concepts in order to gain more detailed insights. In particular, future research might increasingly focus on contemporary companies characterized by a fluid organizational design or by adapted coworking-like concepts. Accordingly, it would broaden our understanding of whether introducing stability factors is thriving or what coherent effects exist.

Furthermore, there are some limitations in the studies with regard to the operationalization of the used variables. These limitations relate primarily to the narratives, rules, and norms generated by the providers, which were collected via computer-aided text analysis (CATA) from publicly available websites (McKenny et al., 2018; Short et al., 2010). Because website information may not provide an accurate picture of the factors, future research should consider a more detailed measurement of narratives, rules, and norms that examine a broader range of materials. Furthermore, coworking-space users were not surveyed on their

perception of the coworking-space environment. Consistent with the person-environment fit theory, other factors may play a role in attracting users to particular coworking-spaces, and future research could isolate and test other mechanisms that play a role in this regard (e.g., Bouncken et al., 2024; Edwards, 2008).

Conclusively, this thesis outlines several avenues for future research related to coworking-spaces and fluid organizational forms in general.

8.3 CONCLUSION AND CONCLUDING REMARKS

In conclusion, this dissertation underscores the perpetual necessity of change within contemporary organizational forms, reflecting Heraclitus's timeless assertion that nothing endures but change. In an era defined by uncertainty, rapid technological advancement, and globalization, the ability of organizations to adapt fluidly is paramount. Nevertheless, the findings of this dissertation reinforce that fluidity is essential and that embracing stability-enforcing organizational structures and processes is not merely a strategic choice but a fundamental imperative for sustaining competitiveness and fostering growth in an ever-evolving world.

The tension between stability and fluidity, rigidity and flexibility, constancy and adaptability affect not only organizational research. This tension is far-reaching, all-encompassing, and always in search of balance. When my PhD journey began in 2019, I could never have imagined that I would not only gain a plethora of knowledge but also be enriched by many forming experiences. These experiences have shown me that this balance between stability and fluidity is also paramount for a successful and happy life. Stay up to date, embrace change, be adaptable, be open-minded, and for the utmost, be curious, but remain loyal to yourself and your values – always.

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