Junior Management Science 9(3) (2024) 1700-1732

Junior Management Science

www.jums.academy
ISSN: 2942-1861

Accelerator Impact on Peer Networking - Examining the Formation, Use, and Development of Inter-Organizational Networks Among Early-Stage Start-Ups

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Abstract

Developing, promoting, and managing networks is a core element of entrepreneurship. Yet, limited research exists on the inherent processes and interaction dynamics underlying the social phenomenon of network formation among nascent companies over time. I conducted a qualitative inductive study with ten founding teams over three months to gain new theoretical insights into inter-organizational network formation among early-stage start-ups in an accelerator environment. The systematically derived dynamic process model proposes a framework capturing different types of peer relationships that change in response to founders' shifting personal and organizational needs over time. It highlights the accelerator's intermediary role in orchestrating network formation among founders through strategic design choices and regulatory program structure, establishing a collectivist organizational culture. Findings point to the entrepreneur's particular context in identifying relevant collaboration opportunities and navigating effective start-up networks, significantly informing the entrepreneurial career trajectory. The theoretical framework offers guidance for ecosystem builders, policy makers as well as opens possibilities for further research in social science and the entrepreneurial landscape.

Keywords: accelerator; entrepreneurial networking; inter-organizational networks; network orchestration; peer networks

1. Introduction

Entrepreneurs are commonly seen as autonomous business owners who develop innovative products or services and pursue new business opportunities, often aggressively and driven by personal interests (Engel, Kaandorp, & Elfring, 2016). While this archetype of the entrepreneur may be true for some individuals, there is much more to entrepreneurship and the individual entrepreneur. What is often overlooked in reality is the intersection between the individual entrepreneurs and the environment surrounding them (Acs et al., 2014; Adner & Kapoor, 2010). Entrepreneurs are embedded in a social network composed of a multitude of interdependencies between all actors in and around the network. Accordingly, not only social networks as a whole but, in particular, the individual sub-relationships within the network as well as within and between members of the network play an integral role in the viability and success of nascent companies (Engel et al., 2017).

1.1. Social networks in entrepreneurship

Although the general value of networks has long been recognized across the entrepreneurial landscape, much of the relevant literature continues to focus on the study of a network's diverse architecture and underlying structural properties (Engel et al., 2017). However, emerging research interest in the activities of entrepreneurs to shape their network relationships underlines the effort of scholars to move away from traditional deterministic approaches of tie formation (see Hoang and Antoncic, 2003; Porter and Woo, 2015; Stuart and Sorenson, 2007). In line with recent developments, entrepreneurs are no longer understood as passive nodes inside rigid network structures, but as self-determined agents who actively and consciously shape their individual community (Hallen & Eisenhardt, 2012; Vissa, 2012). Along with this agent-oriented view, researchers hypothesize that the individual entrepreneur tends to act strategically in forming efficient ties to gain access to resources, create beneficial partnerships, and discover novel opportunities (Hallen &

DOI: https://doi.org/10.5282/jums/v9i3pp1700-1732

Eisenhardt, 2012; Stuart & Sorenson, 2007; Vissa, 2012). Although at first glance, this seems to be a plausible theoretical approach, critical voices point to a number of related operational shortcomings: First of all, this approach reflects an outdated form of heroic behavior on the part of the entrepreneur. Second, entrepreneurial activity is associated with a high degree of outcome uncertainty (Alvarez & Barney, 2005; Burns et al., 2016; McMullen & Shepherd, 2006). In other words, start-up processes are accompanied by unpredictable events, goal ambiguity, and a highly volatile environment, making purely strategic network design increasingly challenging (Alvarez & Barney, 2007; Burns et al., 2016; Miller, 2007). Finally, early-stage start-ups and nascent founders, in particular, often lack the initial network contacts needed to pursue strategically targeted connections in the first place (Engel et al., 2017). Hence, identifying and entering into business-relevant relationships and building strategic social networks is arguably one of the biggest challenges for founding teams, particularly in the early stages of development.

1.2. Peer networks in the accelerator context

To overcome these particular difficulties faced by young entrepreneurs, numerous business support institutions have emerged over the past decade in an attempt to bridge the gap between nascent founders and the broader regional community. Beyond their ability to access a strong external network of universities, investors, and government institutions, a growing body of literature emphasizes the value of internal network structures and relationships taking place within these institutions. In this context, scholars point to the significant role of collaborative networks, whose inherent social interactions and mechanisms may have strong influence on the development of entrepreneurial ventures (Bøllingtoft & Ulhøi, 2005; Krishnan et al., 2020; Soetanto & Jack, 2013).

Facilitating social connections and building an internal community of founders is typically viewed as an essential competency relevant to the nascent phenomenon of start-up accelerators (Hallen et al., 2020). Because the accelerator is not only strongly connected to the broader regional ecosystem but also forms the center of its internal network, it seems to have a crucial role in influencing internal network structures and connectivity among founders (Soetanto & Jack, 2013). In addition, the intense cohort experience particularly evident in accelerator environments is perceived as an excellent opportunity for young founders to connect with peers and learn from the shared experiences of similar individuals (Hallen et al., 2020). Yet, relationships and networks between start-ups prove to be a very abstract and fragmented phenomenon within entrepreneurship research, particularly due to their fluid and dynamic structures associated with starting a new business (Jack et al., 2008).

1.3. Relevance of the research

In this regard, previous literature has conceptualized entrepreneurial networks from a relatively static perspective attempting to explain entrepreneurial behavior based on individual network characteristics. In other words, academic research has been primarily devoted to unlocking the structural components such as individual characteristics and goals of network building (i.e., the *what*), while relatively little is known about the procedural elements such as behaviors and processes (i.e., the *why* and *how*) underlying entrepreneurial networking (Evald et al., 2006). For example, we know little about the social mechanisms that may improve the identification and use of valuable connections in a network. Do early-stage founders find their way to relevant contacts on their own, or do they rely on external support to help them build relationships with other founders? Are memberships in entrepreneurial social networks likely to create a sense of belonging or rivalry among peers? How do relationships relate to the dynamics of the entrepreneurial process, and how do the different forms of connections evolve over time? Due to the lack of research in unlocking the dynamic components of entrepreneurial networks, scholars are increasingly pointing to the need for process-oriented research as an empirical approach to developing a more comprehensive and in-depth understanding of the entrepreneurial phenomenon (McMullen & Dimov, 2013). For this reason, the focus should shift from only examining the characteristics of particular types of relationships to the associated effects and longevity of these different forms (Aldrich & Zimmer, 1986).

Hence, to truly understand the dynamic processes of network formation and the associated social interaction mechanisms between start-ups, it is required to transfer the study of social networks to an entrepreneurial setting, locate it in the unit of analysis between emergence and development (Davidsson & Wiklund, 2001), and follow a holistic approach by examining the contextual phenomenon over time (Dimov, 2011).

1.4. Research objectives and research questions

Accordingly, this paper adopts a qualitative, inductive approach to provide information on the dynamics and change processes of relationship formation over time. The goal of this paper is, therefore, to shed light on the phenomenon of relationship formation between young founders and founding teams to develop a comprehensive understanding of the governing characteristics and dynamics in this process. The process-oriented view allows me to include the temporal context of network formation and draw theoretical conclusions about how the relationships between founders evolve from the first encounter to the end of the study period (Langley, 1999). Because entrepreneurial relationships unfold and underlie the dynamics of a continuous process, a suitable setting is necessary in order to overcome this particular limitation. Since the accelerator environment provides a social system that enables the formation of networks among early-stage entrepreneurs, it seems to be a particularly favorable research setting for observing the phenomenon under study. So far, academic literature has mainly examined accelerator networks in terms of what components they are built of (see Cohen, Fehder, et al., 2019). This paper expands on these findings to discuss how they emerge, change and sustain to understand the impact social networks may have in terms of

accelerators' effectiveness. It further illuminates the role of the accelerator in channeling collective experiences between its tenants. In this regard, I seek to answer the following research questions:

> *(1) How do early-stage start-ups form, use, and develop relationships with other founders?*
>
> *(2) How does the importance of different relationships change in light of the dynamic nature of entrepreneurial activity?*
>
> *(3) How does the involvement of accelerators impact the process of relationship building between founders?*

1.5. Data set and methodology

In line with the previously outlined research questions, I seek to understand the dynamic logic behind the development of relationships among start-ups in their early stages. Thus, since the analysis focuses on the process of relationship building and its related dimensions, I adopt a qualitative inductive approach involving semi-structured interviews with ten early-stage start-ups. In order to gain a comprehensive and transparent insight into the phenomenon under study, I choose a context that promises rich data and a high degree of explanatory power across all individual process steps associated with it (Patton, 2002; Yin, 1994). The accelerator setting provides a natural environment to observe the emergence, change and development of inter-firm[1] relationships over an extended period of time. The approach of a single case study seems most useful in describing the underlying complex process of inter-firm networking while allowing new process dimensions to emerge. Using a process approach (i.e., input-process-outcome), the various dynamic phases involved in developing start-up relationships are examined from the initial encounter to the conclusion of an accelerator program, from which a theoretically conceived framework is derived. The purpose of this framework is to gain deeper theoretical insights into the dynamic nature involved in network building among nascent entrepreneurs and the aspects of entrepreneurial behavior that may influence this process.

1.6. Research findings and contribution

This paper provides an overview of the different phases and types of network formation between early-stage start-ups in the context of an accelerator program. The theoretically derived process model illustrates the social interaction and change mechanisms of network formation between start-ups in a temporal context. Overall, the results of my study point to the importance of dynamic and long-term network building of start-ups that goes beyond their initial phase and highlight the changing importance of different types of relations depending on the respective stage of the entrepreneurial process. They also raise critical questions about the accelerator's current role in promoting network formation and indicate the need to reassess previous program design and management practices.

The theoretical findings and the conceptually derived process model provide several novel insights relevant to academic research, entrepreneurial practice, and individual founders. Firstly, they improve the holistic understanding of the dynamic forms of entrepreneurial network formation based on the changing personal and organizational needs of founders underlying the dynamic nature of entrepreneurial processes. Secondly, they contribute new theoretical insights to social science literature and previous network theory on entrepreneurship by showing that social interaction and network formation among founders is a relevant strategy for start-ups, especially in their early stages. Finally, they reveal how the social environment of start-ups, for example, the environment of an accelerator, may play an essential role in the development of collaborative networks and the strategic management of relationships between founders. Understanding these principles not only improves our understanding of the associated mechanisms within the accelerator environment but also contributes to our overall understanding of the ecosystem's complexity as a whole. It further enhances our understanding of the requirements and opportunities of building and managing an accelerator program in terms of sustainable peer-to-peer engagement. Consequently, the inherent potential of understanding how start-up networks work makes their promotion, support, and development a promising endeavor.

1.7. Structure of the thesis

The remainder of this paper is structured as follows: In the first step, I will provide an overview of theory and previous academic literature combining the established research field of social networks with the still young discipline of entrepreneurship. This part is followed by a description of the research process, providing an overview of the methodology, including the chosen techniques for collecting and analyzing the empirical material. The subsequent section introduces the results of my analysis, followed by an interpretation of the findings in the discussion section. Finally, the study concludes with limitations and possibilities for future research.

2. Theoretical background

The following section reviews the core literature on social network theory. In particular, it highlights areas relevant for a better understanding of the social nature and characteristics underlying entrepreneurial behavior, as well as those influencing innovation capacity.

2.1. Social networks

By understanding how social networks are structured, what elements they consist of, and how they function, it is

[1] I use the terms "inter-firm" and "inter-organizational" interchangeably throughout this paper.

not only possible to design them accordingly but to use them effectively. Furthermore, a better theoretical understanding helps to contextualize the complex relationships between the actors[2] within the entrepreneurial social network of an accelerator and to be able to classify the dynamics underlying the entrepreneurial journey. Since social networks are a topic in their own right and the subject of extensive research and lengthy debates, this section intentionally provides a condensed version of the theoretical underpinnings and broadly accepted concepts that remain within the scope of this paper. In particular, Granovetter's (1973) strength of weak ties theory, Burt's (1992) structural holes theory, and Coleman's (1988) theory of social capital form the starting point of the underlying work providing an approach to the topic of social networks that subsequently allows for further analysis in an entrepreneurial setting.

2.1.1. Definition of social networks

Networks channel the flow of resources, regulate access to information and constitute a significant driver of innovation (Borgatti & Halgin, 2011; Obstfeld, 2005). While some theories (see Burt, 1992) assume that structural holes help actors advance their interests, others (see Granovetter, 1973) emphasize the importance of the strength of connections between networks to obtain opportunity-related information. Although overall research on social networks has increased considerably in recent years, there is still confusion about the fundamental meaning, characteristic elements, and practical applicability underlying network theorizing (Borgatti & Halgin, 2011).

Borgatti and Halgin (2011), therefore, provide a typology regarding the relations between individuals within a network. According to the authors, a social network is characterized by a certain number of nodes (i.e., actors in the network) linked by a defined number of connections of a specific type (i.e., the type of relationship between the actors in the network). These can be distinguished in terms of their content, intensity, and form. Unlike groups, networks do not have natural boundaries and do not necessarily have to be interconnected, allowing multiple unconnected network components to coexist. However, over time, the number of fragmented network components as well as the distance between nodes can change, indicating the dynamic and fluid properties of a network (Lorenzoni & Lipparini, 1999). For instance, two individual actors may initially be characterized by their maximum disconnectedness in the network, although this state may shift or take a different form over time. This would be the case within a friendship or partnership. Essentially, it is assumed that spatial proximity and long-term connections between individuals have a strong impact on the quality of the respective relationship (Lorenzoni & Lipparini, 1999). Moreover, the authors distinguish between two main types of relationships: State-type and event-type ties[3]. States can be defined by their continuity over a specific period of time (e.g., a friend). In contrast, events are countable and transient in nature (e.g., conversations, business transactions, etc.). Both types of connections enable the flow of information, ideas, or goods through interaction between two nodes. Flow frequency, that is, the amount of exchange, can differ significantly depending on the nature and strength of the relationship between two actors (Borgatti & Halgin, 2011).

Beyond these formal and rather abstract definitions, researchers suggest that the overall structure of the relationships determines the possibilities and constraints for the actions of individuals in the network (Borgatti & Halgin, 2011). Studies in this context primarily focus on so-called network structures (i.e., the patterns of relationships between actors) and node positions (i.e., the location or distribution of nodes in the network) and relate them to group and node outcomes. Accordingly, the effect of the structural properties of a network depends on the meaning of the relationships in a particular social context. For this reason, network structures do not have universal but dependent social meanings and consequences (Pachucki & Breiger, 2010). Relational theories are devoted explicitly to the social consequences of structural network properties. In this regard, Granovetter's (1973) strength of weak ties theory and Burt (1992) structural holes theory are two well-known approaches that explain individual advantages such as access to information, bargaining potential, or career opportunities with increasing centrality of actors. In contrast to relational theories, network theories are dedicated to explaining the structural properties of networks from categorical initial conditions. They show that relationships emerge, for example, as a function of spatial proximity, similar social status, or shared organizational affiliation (Borgatti & Halgin, 2011).

2.1.2. Importance of strong and weak ties

A key property of social networks, first addressed by Granovetter's (1973) paper and now a centerpiece of network research, is the strength of relationships. The author developed his interpretation of the degrees of strength of relationships and their usefulness by drawing on findings on processes of relationship formation in social psychology. In doing so, he referred to Heider's (1958) theory on the structural balance of relationships among peers and Davis's (1963) application of this theory to the formation of groups involving individuals with similar interests and interacting partners. The resulting strength of weak ties theory (Granovetter, 1973) has since become an established paradigm and has been increasingly applied as part of the broader theory of social networks (Borgatti & Halgin, 2011). In particular, researchers have focused on the varying degrees of strength of relationships and their impact on the interpretation of network structures or the function of individual elements within a network. In

[2] I use the terms "entrepreneurial actor", "entrepreneur" and "founder" interchangeably throughout this paper.

[3] I use the terms "tie", "connection" and "relationship" interchangeably throughout this paper.

this context, the terminology of strong and weak relationships has been widely adopted by multiple authors in the field when referring to the viability or quality of relationships as part of a social network. Based on Granovetter's (1973) assumptions, the most important factors that influence the strength of ties are the amount of time two people spend together, the degree of intensity and intimacy in terms of the content of time spent together, and the amount of mutual exchange between the actors involved. His research suggests that the stronger the bond between two actors, A and B, the more likely they will share the same social world in which they connect with the same third party, C. In other words, if A knows B and B knows C, chances are high that A and C also know each other. This typification of ties characterizes strongly intertwined networks in which the actors are socially involved with each other, such as within a family or a close circle of friends. Strong emotional bonds of this type enable people to trust others with confidential, private, or otherwise important matters. However, Granovetter (1973) assumes that strongly connected individuals with the same interests and circumstances would frequently share information that is already known and thus redundant. In contrast, the more diverse the personal network between two actors A and D, and the lower the frequency and intensity of their encounters, the more likely they will possess different sets of information and knowledge. He, therefore, assumes that weakly connected individuals can derive more significant benefits from each other by exchanging novel ideas, non-redundant information, or contacts by creating a bridge between their two individual core networks.

This metaphorical bridge between two actors in a social network was further elaborated in Burt's (1992) theory of structural holes. He argued that weak ties only gain significance when serving as bridges for structural holes between multiple networks, allowing the flow of knowledge, information, and value between them. According to the author, innovation takes place at the edges of social networks. In particular, he assumes that people at the edges, near the structural holes, can act as intermediaries or brokers between otherwise unconnected network clusters allowing new opportunities to develop. Overall, their argument differs in that Burt (1992) defines proximity to structural holes, and thus social position in the network, as central, while Granovetter (1973) assumes the strength of ties between individual actors as the key to value creation. Figure 1 and Figure 2 illustrate the different rationale behind the two premises in a simplified fashion.

While both authors emphasize the importance of weak or bridging ties, recent research increasingly advocates the need for strong ties in a network. Krackhardt (1992), for example, agrees with the authors that weak ties are essential for obtaining information but additionally underlines the role of strong ties in exploiting that information as they build trust and function well together.

Although overall, the classification of relationships as strong or weak influences the understanding of network structures and the role of actors within a social network, critics question the practical applicability of the theory, as the notions remain fuzzy in content and therefore allow for different interpretations and applications. In addition to studying social networks in terms of their composition and structures, other streams of research within network analysis examine the quality of the individual connections they are comprised of. Looking at relationships from an instrumental perspective, their value can be measured in terms of social capital, comprising all resources available within the actors' social connections. The following section provides an overview of the concept of social capital as well as an understanding of how it is created and used throughout a social network.

2.2. Social capital

Social capital is integrated into a social structure through interpersonal relationships rooted in social networks (Coleman, 1988). In fact, most individuals are embedded in social contexts and therefore maintain social relationships, the benefits of which they can take advantage of (Kim & Aldrich, 2005). The concept of social capital is arguably one of the fastest-growing research domains in network studies and has significantly increased interest in sociology, political science, and business (see Burt, 1992). Most theories in this area examine how relationships between actors can be used as capital and how the value of these relationships can be determined. Thus, in its broadest sense, social capital can be defined as the value of connections or the sum of resources resulting from relationships with others (Baron & Markman, 2003; Borgatti & Foster, 2003). According to the argument on structural holes, social capital can also be created through a network in which actors (i.e., brokers) can mediate connections between otherwise separate segments (Burt, 2001). Burt (2001) believes that through the function of brokerage, the construct of social capital is given a more precise meaning than through a network of strongly connected actors.

To answer the questions of where social capital comes from, how it can be used, and what criteria to apply to assess its value, network theories often draw on influential terminologies and concepts of James Coleman (1988, 1990), Pierre Bourdieu (1983, 1985) and Robert Putnam (1993, 1995). However, as with other prominent sociological concepts, the term itself has become increasingly vague, and the underlying meaning is elusive due to its extensive application in many fields. To date, a number of definitions have evolved over the years, demonstrating the concept's widespread use within the academic community. For the underlying research topic, however, it seems necessary to establish a consistent understanding to be able to follow the subsequent theoretical considerations. A few of the most established definitions are outlined in the following to illustrate the diversity of perceptions on this topic and to subsequently establish a terminological consensus for the course of this thesis.

2.2.1. Definition of social capital

Coleman (1988), one of the pioneering theorists in the field of social capital, defines the term as a function of social structure creating advantage: "Social capital is defined

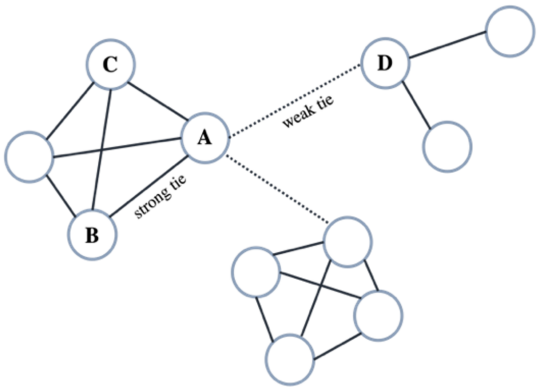

Figure 1: Strong and weak ties in a social network
(Source: Own illustration modified from Borgatti and Halgin (2011, p. 4))

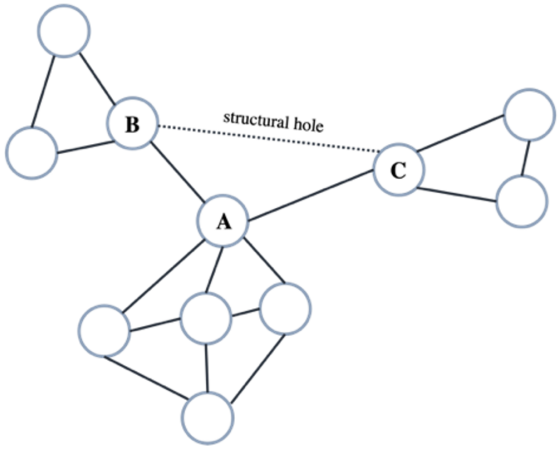

Figure 2: Node A's bridging role in a social network
(Source: Own illustration modified from Borgatti and Halgin (2011, p. 4))

by its function. It is not a single entity but a variety of different entities, with two elements in common: They all consist of some aspect of social structures, and they facilitate certain actions of actors - whether persons or corporate actors - within the structure" (p. 92). Bourdieu's (1985) definition refers less to the individual action but relates the concept of social capital to the social environment within which an actor is located: "Social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (p. 248). Following Putnam's (1993) definition, the concept of social capital usually includes norms and values that arise within a relationship structure and have a positive effect on people's solidary action: "Social Capital here refers to features of social organizations, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated action" (p. 167).

Even though the perspectives cited above have different definitions and approaches, they agree on the generation of social capital. The available social capital is derived from individual social relationships that create advantages for the individual or group. Accordingly, social capital can be broken down to the general idea that some people enjoy advantages because of their relationships with others (Burt, 2004; Lin, 2001).

2.2.2. Characteristics and forms of social capital

Development of Social Capital

When studying the origins and formation of social capital, sociologists tend to follow a bottom-up approach (Coleman, 1988; Portes, 1998), while it is predominantly political scientists who take the contrary view of the top-down approach (cf. Evans, 1996; Levi, 1996; Woolcock, 1998). According to the bottom-up perspective, social capital is primarily the result of individual social relationships. By cultivating these relationships, social capital can be aggregated into a collective resource creating shared benefits (Burt, 1992; Portes, 1998). This approach assumes that networks are formed through cooperative action, which constitutes the basis for social behavior and generalized trust. Especially trust between people is an essential element in social relationships and affects the

extent to which social capital is maintained or decays (Putnam, 1995; Yen et al., 2015). In contrast to the bottom-up approach, the top-down perspective views social capital as created by state or public institutions promoting standards and values through regulation and fostering trust in the wider community (Levi, 1996).

Both approaches are based on the idea that the more social capital a group has, the stronger its cohesion. However, the controversial question discussed in both approaches is whether there is a predominant direction from which social capital is generated. Thus, the question remains whether a state's or organization's respective governance leads to mutual trust within social networks or whether the individual actors and the relationships at the micro-level drive the emergence of social capital (Fuchs, 2020). Especially in network analyses, it, therefore, seems crucial to account for the context in which social capital is being studied and to consider the corresponding level of investigation (micro-, meso- or macro-level).

Forms of Social Capital

Another dimension based on which social capital can be distinguished is the type of connection between individuals or groups. Putnam (2000) differentiate between bridging and bonding social capital. The former can be attributed to Burt's (1994) notion of structural holes between networks, describing relationships with external people outside the individual's core network (Adler & Kwon, 2002). This type of bond is typically reflected in heterogeneous group compositions in which members differ, for example, in terms of status, generation, or gender. On the other hand, bonding social capital is based on reciprocity and norms of trust. It refers to cooperative behavior or support measures toward people similar to oneself, often acquaintances, relatives, or friends. As the names already reveal, bonding social capital, in contrast to bridging social capital, has an effect on an actor's internal or existing network. It can, therefore, also strengthen identity or cohesion within the network based on shared norms and a mutual sense of trustworthiness (Coleman, 1988). Bonding social capital is what Coleman (1988) defines as closure within a network.

While the two forms of bridging and bonding social capital can be separated in theory, they are not necessarily mutually exclusive in practice (Fuchs, 2020). In particular, both views can provide significant value depending on the context and the objectives of the relevant people involved (Adler & Kwon, 2002). On this basis, the theoretical distinction allows us to examine the characteristics of social capital from multiple perspectives in different contexts.

Value of Social Capital

In network research, social capital is often ascribed an inherent benefit. It can be used as a resource to maximize utility underlying the economic principle of rational action and expressed in support or assistance services between two or more individuals (Coleman, 1988). Coleman (1988) similarly assumes that with the help of interpersonal relationships and networks, goals can be achieved that would otherwise be unattainable. The resources resulting from social capital may be another person's knowledge, social or financial support, or other forms of assistance (Putnam, 2000). In addition, social connections between actors within or between networks can facilitate the acquisition of valuable information, which is also an incentive for cooperative action. This form of social capital is consistent with the findings of the theories of Granovetter (1973), who places information sharing at the center of his approach. However, according to Burt (1997), such information advantages do not necessarily arise through an increased number of network connections but through strategic positioning within the network. In particular, heterogeneous relationships can help gain access to more varied information. Beneficial opportunities, such as referrals, often accompany these benefits as individuals with a diverse portfolio of contacts are often more attractive to external parties. Additionally, individuals with networks rich in structural holes benefit from the complementary properties of social capital. Compared to individuals with a relatively homogeneous or limited network, these people are more likely to identify and exploit rewarding opportunities, further leveraging their individual capabilities, usually referred to as human capital (Burt, 1997).

The abstract and versatile nature revolving around the concept of social capital is nothing new. What is new about it, however, is that established theories of social capital are increasingly leaving their traditional areas of application and moving into new areas of sociology, including start-up research. Still, the literature on entrepreneurial networks currently seems to hold different perspectives regarding the underlying principles of social capital and the importance of different types of networks throughout the entrepreneurial process (Scott, 2011). The following section, therefore, aims to improve the understanding of the role of social networks and collaborative relationships in the context of entrepreneurial activities.

2.3. Social network theory and entrepreneurship

The success of start-ups depends, among other things, on the ecosystem surrounding them, that is, the relationships and interactions between actors that shape their immediate social network (Greve & Salaff, 2003). The widespread image of the entrepreneur as an independent and autonomous leader is long outdated. Entrepreneurship is a social phenomenon embedded in a social context. Indeed, following premises from social network theory, entrepreneurship is a phenomenon embedded in networks of enduring social relationships (Walker et al., 1997). The inclusion of actors in networks of different relational content has recently prompted a large body of research that has shifted the focus from examining the individual characteristics of entrepreneurs to understanding the relationships between them. Most researchers agree that the individual entrepreneur should no longer be viewed in isolation but as a social entity enclosed

by a broader social environment, the effects of which influence the entrepreneur's behavior and actions (Aldrich & Zimmer, 1986).

2.3.1. Entrepreneurial networks and networking

In the context of entrepreneurship research, network theorizing has received wide recognition and has long been argued as one of the essential factors for acquiring resources, providing emotional and professional support, reducing the risk of failure as well as improving innovation performance and competitiveness (Baum et al., 2000; E. L. Hansen, 1995; Jack et al., 2008; Pittaway et al., 2004). Theories of alliance networks, in particular, assume that the formation of alliances, especially among young and resource-constrained firms, will help them overcome liabilities of newness and smallness and increase their overall chances of survival (Gulati, 1998; Teece, 1992). Accordingly, entrepreneurs organize and coordinate available resources in the social network by interacting with others to pursue or exploit an entrepreneurial opportunity (Baum et al., 2000).

To date, most studies of entrepreneurship and entrepreneurial behavior from a social network perspective are concerned with investigating and understanding different types of relations between actors in the network who provide the resources and knowledge necessary for starting a business (Johannisson, 1988; Larson, 1991). In this regard, Aldrich and Zimmer (1986) suggest that the strength of these types of relationships primarily depends on the frequency and reciprocity of the relationship (i.e., the expectation of the favor being returned). According to the authors, a network of strong relationships helps the entrepreneur to activate cognitive and emotional resources such as self-confidence and to remain motivated throughout the entrepreneurial journey (Aldrich & Zimmer, 1986). Due to high information redundancy, however, networks whose actors are highly interconnected are assumed to have lower innovation capacity. For this reason, entrepreneurs do not necessarily seek the support of those closest to them but instead form weak ties with actors they believe will rationally benefit their business. Although weak relationships are less reliable, they are a particularly important source of relevant and diverse information for the entrepreneur (Aldrich & Zimmer, 1986; Granovetter, 1973). Rost (2011) likewise examines the strength of ties in the entrepreneurial environment. She argues that combining strong and weak ties is crucial for enhancing knowledge transfer and innovation capacity. According to the author, weak ties facilitate access to peripheral network positions and thus to new knowledge and ideas, while strong ties ensure the translation of these ideas into innovative solutions, indicating the complementary potential of both conditions. Overall, a personal network structure with a balanced mix of strong connections within the core cluster and a large number of weak ties that form bridges to other network clusters has been found to be particularly conducive to the founder's economic success (Rost, 2011; Uzzi, 1997, 1999).

2.3.2. Entrepreneurial network dynamics

Aside from the difficulty of studying the different structures of start-up relationships and classifying them adequately, a relatively recent line of research focuses on examining how different types of relationship networks change over time (Jack et al., 2008). As Burt (1982) noted, in addition to examining the structural properties of networks, network analyses should also consider associated procedural changes. Understanding how relationship structures change over time can provide insights not only into how relationships are formed but also into how they affect subsequent relationship formation. Typically, two fundamentally different perspectives are considered in this context. The former identifies network structures based on the development of the entrepreneurial project. The opposite view attempts to describe the types of relationship structures that impact the development of the venture (Lamine et al., 2015). While some researchers argue that relationship structures may change over time due to external influences, others assume that entrepreneurs consciously adapt their network structures based on strategic decisions (Jack et al., 2008; Stuart & Sorenson, 2007). At the same time, however, critics in this context point to the limited applicability of rational network design due to the uncertainty underlying the entrepreneurial processes (Engel et al., 2017). In this context, for example, Nebus (2006) posits a heuristic theory of network formation arguing that in information-poor or uncertain situations, new connections must be made before their potential value can be assessed.

Although ideas for efficiently building and managing relationships improve our general understanding of how network structures work, individuals' networks often lack the necessary efficiency. Building and maintaining meaningful relationships requires competencies not necessarily derivable from social behavior.

2.4. Start-up accelerators as social networks

Creating an enabling environment for new and emerging companies to overcome some of these challenges is precisely the approach relevant to the accelerator phenomenon. Accelerators play an essential role in this context facilitating access to valuable network contacts and thus shortening the path to appropriate resources. Unlike the established research and literature on social networks, accelerators are a relatively new form of entrepreneurial support organization and are still an insufficiently researched field in which terms and definitions are constantly changing (Goswami et al., 2018). For this reason, it is necessary to only address the critical findings of network theories in the context of accelerator research and to confine myself to one accepted definition of an accelerator to guide the remainder of this thesis. The underlying section, therefore, only presents the broader understanding that provides the necessary framework for examining more specific questions in the context of one particular accelerator.

2.4.1. Definition of accelerators

Start-up accelerators are a relatively novel but rapidly spreading phenomenon within the entrepreneurial landscape, helping prospective founders recognize and navigate the business challenges faced in their early stages of growth (Cohen, Fehder, et al., 2019). Proliferating over the last decade, they have become synonymous with any form of initiative designed to help nascent entrepreneurs compensate for their lack of knowledge, financial resources, and contacts with relevant partners within a protected environment (Cassar, 2004; Shepherd et al., 2000). Because of the novelty of the phenomenon, a considerable amount of recent research has been devoted to answering relevant questions about what accelerators are, what they do, and to what extent they effectively deliver on their core message of accelerating businesses (see Cohen, Bingham, and Hallen, 2019; Cohen, Fehder, et al., 2019). Inside the complexity of answering these questions, a widely accepted definition has emerged identifying accelerators as fixed-term, cohort-based initiatives, providing mentorship and educational components, concluding in a public pitch event, commonly referred to as demo-day (Cohen, Fehder, et al., 2019). In this sense, the accelerator differs from other entrepreneurial support institutions, such as incubators, particularly in terms of its finite duration and cohort-based structure. Beyond that, however, accelerators exhibit some common characteristics with those of incubators. For example, the provision of networks is considered an essential element of entrepreneurial support in both incubator and accelerator environments (M. T. Hansen et al., 2000; Soetanto & Jack, 2013). As with most incubators, participants in accelerators receive access to the accelerator's broader external network, such as universities, companies, and investors. Although access to external networks remains crucial for entrepreneurs to source potentially relevant contacts, recent studies have increasingly turned their attention to investigating internal networks, that is, networks between the founders operating in an accelerator environment (Bøllingtoft, 2012; Krishnan et al., 2020; Soetanto & Jack, 2013). Particularly given the fact that many accelerators co-locate their members under one roof for the duration of the program, the associated emergence of internal networks not only seems obvious but deserves closer examination in this regard.

2.4.2. Networking in accelerators

The success of start-ups essentially depends on the ecosystem surrounding them, that is, the nature of interactions between the actors as part of the local environment and the network connections they create. Making network connections is typically viewed as an essential competency of accelerators (Hallen et al., 2020). Compared to the ubiquitous role of accelerators in connecting founders to the regional ecosystem, the role of the accelerator also includes its ability to foster internal network connections among founding teams (Soetanto & Jack, 2013). There is hardly a mission statement of an accelerator that does not emphasize the importance of social collaboration with peers experiencing similar challenges (Krishnan et al., 2020). While this characteristic may hold for different types of start-up support institutions, social networking seems to be even more prevalent in accelerators due to the intensity of the program, the short duration, the cohort-based structure, and the inherent nature of accelerators to encourage their members to interact and support each other. On this premise, accelerators create collaborative environments for nascent founders, often in the form of an enclosed spatial setting designed to promote physical proximity and opportunity for interaction (Saxenian, 1994). In this context, peer connections between founders constitute a key source of social exchange in terms of advice, professional guidance, and emotional support (Hallen et al., 2020; Huang & Knight, 2017; Saxenian, 1994). Other authors increasingly point to the importance of peer effects in the context of learning from each other and sharing mutual experiences (Kacperczyk, 2013; Nanda & Sørensen, 2010). Ahmad and Ingle (2011) even consider internal social networks between founders as the most essential element of entrepreneurial support organizations. The exact nature of the network and the degree of interaction among founders, however, depends largely on the composition of the cohort in terms of its relative similarity, prior experience, and technical expertise as well as the accelerator's overall organizational and structural design (Cohen, Fehder, et al., 2019).

2.5. Research questions

Despite common academic agreement on the inherently collaborative nature of the accelerator environment, little is known about the respective mechanisms of collaboration and the interactive behavior of accelerator tenants: How do start-ups connect? How do networks of founders form? And what role does the accelerator play in channeling collective experiences among its tenants? In this study, I use a process-oriented qualitative approach (Denzin & Lincoln, 2005) to develop an inductive theoretical model (Strauss & Corbin, 1990) seeking to shed light on the various interaction dynamics among founders. The accelerator context seems to provide an excellent ground for studying social interaction mechanisms, internal relationships, and the emergence of founder networks. In particular, locating the accelerator at the meso-level of analysis allows for an in-depth assessment of its mediating role between individual actors and the broader social network of founders. In this regard, I seek to answer the following research questions:

> *(1) How do early-stage start-ups form, use, and develop relationships with other founders?*
>
> *(2) How does the importance of different relationships change in light of the dynamic nature of entrepreneurial activity?*
>
> *(3) How does the involvement of accelerators impact the process of relationship building between founders?*

3. Research methodology

I adopted a qualitative inductive approach embedded in a single case study to gain a deeper understanding of the underlying social mechanisms related to the accelerator landscape and to formulate new theoretical foundations on the dynamics of the entrepreneurial process.

3.1. Research context and design

Compared to the amount of quantitative variance-based theories providing answers to the *what*, entrepreneurship research often fails to account for the underlying temporal nature of the phenomena under study (Gartner & Birley, 2002; Van de Ven, 1992). In addition, phenomena in entrepreneurship, including concepts such as social capital or entrepreneurial activity, often exhibit unusual characteristics or substantial variations in the data (Crawford et al., 2015; Davidsson, 2016). In such cases, quantitative research approaches often involve cumbersome modeling procedures to adjust for biases and outliers in the data. In contrast, qualitative research is less restrictive and allows for a more detailed examination and interpretation of deviant findings or extraordinary outcomes (Aguinis et al., 2013). Therefore, to advance the study of research and to fully unravel the complexity of entrepreneurial dynamics, researchers are increasingly advocating the use of process-oriented qualitative methods to capture processes and sequences of events holistically and over time (Shepherd et al., 2015; Van de Ven & Engleman, 2004). Due to the lack of in-depth understanding of network development processes in entrepreneurial research, I employ a qualitative, exploratory single, and holistic case study approach. Qualitative data collection proves to be a particularly suitable method for studying complex processes, as it allows phenomena to be holistically captured, taking into account their development over time (Langley, 1999). In particular, choosing a single case is justified when the relevant case provides access to a social field that is still relatively young in nature and/or lacks theoretical understanding (Eisenhardt, 1989). In addition, case-based data offers explanations for the *how* and *why* of the phenomenon under study as they guide the underlying work (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). These explanations often form the basis for the emergence of theoretical constructs that highlight the deeper narrative description of the process under study expressed in an underlying pattern of events (McMullen & Dimov, 2013; Miles & Huberman, 1984; Pentland, 1999).

3.2. Sample selection and data collection

Given my interest in exploring and understanding the dynamic phenomenon of networking among start-ups at the micro level, I adopted a purposive sampling approach. This approach seemed most promising for obtaining rich data about the phenomenon under study and a high degree of explanatory power across all individual process steps associated with it (Patton, 2002; Yin, 2009). To initiate my research, it is essential to identify an appropriate research context that would (1) allow a transparent and in-depth view of the underlying dynamics in a real-life setting and (2) provide access to both potential sample candidates as well as other relevant stakeholders involved in the formation process (Yin, 2003).

Start-up accelerators provide the natural context that satisfy both criteria. The particular setting and dynamic nature of an accelerator offer various insights into the characteristics of start-up relationship formation: How relationships are formed, used, and sustained. Studying the accelerator environment in this context not only helps to understand certain determinants such as individual characteristics and cognitive processes involved in relationship building among founders but also provides the basis for systematically managing both contextual and sociological conditions, such as information and resources availability, that influence the formation process (Dimov, 2011). Additionally, the fact that start-ups typically do not know each other personally prior to joining an accelerator program increases the likelihood of natural network effects being observed (Cohen, Bingham, & Hallen, 2019). Finally, by providing a comprehensive and thorough account of the entrepreneurial experience in a real-world setting, observable principles and interrelationships among internal actors also suggest transferability to other contexts (Gioia et al., 2013).

I initiated my research by investigating an accelerator of a large technical university in a German metropolitan region. The accelerator provides access to a mature institutional ecosystem that supports young entrepreneurs in implementing and scaling up technology-driven business ideas. In particular, the accelerator focuses on high-tech start-up teams from diverse industries in their early formation phase. Key support areas include customer acquisition, business model development, and venture capital funding. As part of a larger entrepreneurial network, the accelerator serves as an interface for start-ups to connect with investors, business angels, mentors, industry partners, and innovative companies. The program includes a 12-week curriculum during which founding teams benefit from various coaching, mentoring, and workshop formats. During this time, they also have the opportunity to use the accelerator's services and office space, with the option of a three-month extension of use upon completion of the program. At the time of the study, the accelerator accommodated a total of 14 early-stage (i.e., pre-seed or seed stage) technology-based start-ups, half of which participated in the program on-site and half remotely, attending events or workshops only on a bi-weekly basis. All participants identified themselves as founders or co-founders of the company while none of the respondents reported any previous exit through the sale of an earlier venture ensuring homogeneity of teams in terms of their entrepreneurial experience. I contacted all 14 start-ups, 10 of which were available for the complete duration of the study and willing to communicate their experiences and attitudes transparently and reflectively, which I considered necessary for the formation of a reliable theoretical framework (Bernard, 2017).

To best capture participants' voices and give theoretically scientific meaning to their experiences, I conducted two rounds of semi-structured interviews with one representative from each start-up, which serve as the primary source of data for my study (Gioia et al., 2013). Interviewing participants twice is consistent with my goal of exploring the dynamic process and development behind the phenomenon of relationship formation. The first round of interviews was conducted three weeks after the program began to ensure a certain level of familiarity among the participants, and another round at the end of the program to capture possible changes in relationships among founders. Studying network formation in real time helps me overcome the methodological challenges of hindsight or recall bias common in retrospective studies (Davidsson & Honig, 2003). An overview of the relevant start-ups can be found in Table 1.

As the qualitative single case study is not a method as such but rather a procedure in which different methods can be combined, I collected data from three types of sources, all in the form of semi-structured interviews: (1) Start-up representatives from the active cohort at the time of the study, (2) start-up representatives from the previous cohort, as well as (3) representatives from the accelerator team. Interviewing previous start-ups allows me to assess the validity of the research results by comparing retrospective and real-time accounts while serving as valuable input for the guiding questions addressed in the second round of interviews. The five representatives of the accelerator team were chosen as key informants based on their extensive insights into relationship building among start-ups and/or familiarity with internal strategies and policies around network building within the organization. Informants were recommended by program management to ensure their eligibility and competence in answering my questions about the topic under study. This led to the identification of two venture consultants (later referred to as coaches), two external advisors (later referred to as mentors), one of whom was the former head of operations, as well as the managing partner of the program. By incorporating multiple data sources from different individuals into the data collection process, additional perspectives can be added to the empirical foundation of the findings from participant interviews to account for a nuanced understanding of the phenomenon of interest (Neergaard & Ulhøi, 2007; Yin, 2009). This type of data source triangulation allows for validating the data by minimizing the possibility of data bias due to falsified or distorted responses from interviewees (Kumar et al., 1993). Appendix 1 and Appendix 2 provide an overview of the start-ups from the previous cohort and accelerator team members, including a summary description of their roles and associated tasks within the program.

In total, I conducted 24 semi-structured interviews (including both interview rounds), each of which lasted 20-90 minutes (excluding introductory conversations), was digitally recorded, and transcribed to ensure the completeness and accuracy of the data. Except for one interview, which took place in person, all interviews were conducted via the video communication tool MicrosoftTeams or GoogleMeets, with permission to record the interviews obtained in advance. The statements of the interviews conducted in German were translated into English. To create a common ground on which interpretive comparisons could be made, I followed a similar set of questions across all interview groups essential to answering the research questions while leaving enough room and openness for new perspectives and concepts to emerge. Therefore, I revised the initial interview protocol several times to adjust specific questions, sharpen the focus in light of my research question, or account for possible twists and turns in the process (Glaser & Strauss, 1967). Appendix 3 to Appendix 5 include the general interview protocols for the three groups of respondents, with adjustments to the initial questions indicated in italics. The individual questions of the first round of interviews were divided into two main categories addressing (1) the start-ups' perception regarding the internal network within the accelerator and (2) the role of the accelerator in forming and developing relationships between the start-ups. Follow-up questions were asked in the second round of interviews to capture any changes in the relationships between the start-ups at the beginning and end of the program. Constant comparison allowed me to iteratively compare the data across informants and over time (Strauss & Corbin, 1990). To ensure anonymity, the real names of the respondents were replaced by consecutive digits.

3.3. Data analysis

Following a grounded theory approach allows theoretical models to be derived from the available data in order to explain social phenomena in their natural environment (Strauss & Corbin, 1998). Additionally, it is one of the few methods that specify not only how data should be collected, but also how it should be analyzed, which directly involves the researcher's inner attitude toward the subject. In this context, it is particularly important to separate the data from existing cognitions and attitudes (Suddaby, 2006). Therefore, in order to analyze the underlying process in an unbiased and open-ended manner and to provide sufficient explanatory theoretical insight, I deliberately refrained from a quantitative research approach at this point. Instead, I applied an inductive coding approach by strictly following the underlying data throughout the process of data analysis to allow theoretical constructs to emerge (Glaser & Strauss, 2008). Moreover, an inductive approach is particularly appropriate when the specific context can provide additional important insights into the studied phenomenon (Saunders et al., 2012). Previous theories were only considered after the evaluation process was completed in order to allow for the comparison of my own findings with those of the literature. Since the underlying accelerator involves a larger social unit, it was important to compare patterns of interpretation and action of the individual founders in order to develop propositions about the respective social unit and the patterns of action and selection decisions typical for it. Superordinate patterns and constructs within the social network emerged from the com-

Table 1: List of interview partners - start-up sample

(Source: Own illustration)

Interview Partner	Role	Venture Stage	Technology	Industry	Type of Participation
Start-up 1 (S1)	Co-Founder, CFA	pre-seed	BioTech	Diverse	remote
Start-up 2 (S2)	Co-Founder, CEO	pre-seed/ close to seed	AI, NeuroTech	Gaming	on-site
Start-up 3 (S3)	Co-Founder, CEO	pre-seed	AI, DeepTech	Inventory, Sustainable Production	on-site
Start-up 4 (S4)	Co-Founder, CEO	pre-seed	Robotics	Mobility	on-site
Start-up 5(S5)	Co-Founder, CEO	pre-seed/ close to seed	LogTech (Logistics), SaaS	Transportation, Supply Chain	on-site
Start-up 6 (S6)	Co-Founder	pre-seed	HealthTech	Healthcare	remote
Start-up 7 (S7)	Co-Founder	pre-seed	FoodTech	Food	remote
Start-up 8 (S8)	Co-Founder	pre-seed	AgTech (Agriculture)	Agriculture	remote
Start-up 9 (S9)	Co-Founder, CTO	pre-seed	LegalTech	Diverse	on-site
Start-up 10 (S10)	Co-Founder	pre-seed/ close to seed	UrbanTech	Construction	remote

parison of roles and action patterns of the individual members.

I began my data analysis with an open coding approach by assigning codes to the collected data in order to break down the overall phenomenon into sub-processes and to develop possible explanatory building blocks for the evolving theoretical framework (Strauss & Corbin, 1998). Categories were created based on the in vivo coding approach adhering to the terms and language used by the informants (Strauss & Corbin, 1998). I used descriptive expressions when an in vivo code did not seem useful or was not available. These resulting first-order codes allowed me to create narratives while aligning the data as closely as possible to respondents' perspectives (Langley & Abdallah, 2011). In the next step, I applied axial coding (Strauss & Corbin, 1998) to search for possible connections between the developed categories, finally grouping them into so-called second-order themes at a higher level of abstraction (Gioia et al., 2013). By further comparing the data, I was eventually able to reduce the data to a minimum of seven aggregate dimensions which form the basis for the theoretical data structure. The graphical representation of the data not only allows to understand the elaborated logic of the data but also to visually recreate the process of analysis - a crucial element in demonstrating qualitative rigor in research findings (Pratt, 2008; Tracy, 2010).

I coded the data using MAXQDA, a qualitative data analysis program. This allowed me to structure the data and group related concepts into categories. Throughout the coding process, I followed an iterative approach, repeatedly reviewing and revising the codes and categories that emerged from the data to identify potential distinguishing features and/or commonalities (Strauss & Corbin, 1998). I followed this process until theoretical saturation was reached and no more new substantive insights could be gained through further interviews (Glaser & Strauss, 1967). The resulting coding scheme comprised 55 summarized first-order codes derived from the individual respondents' statements. I clustered the first-order codes into second-order themes until no more new themes could be identified. This resulted in a total of 21 second-order themes that were evident across all interviews. Finally, the themes were grouped into seven overarching aggregate dimensions. Only findings that could be confirmed by multiple responses from different interview partners are provided in the subsequent quotes. The overarching data structure derived from the data collection and analysis is depicted in Figure 3.

The following section presents the main findings that emerged from the extensive coding and analysis of my data. I then interpret the results to derive a central theoretical construct as a basis for practical application and subsequent research.

4. Results

Before delving into the detailed presentation of the results of my data, I would like to point out that the interviewed start-up teams had already been actively participating in the accelerator program for three weeks prior to the start of the first round of interviews. This was an essential prerequisite for the initial data collection to assume a certain level of interaction between the teams. In the case of my sample, the majority of all start-up teams were at an early stage of the development process (pre-seed or between pre-seed and seed stage) with a professional network that was not yet well established. This fact, coupled with the teams' full-time participation in the program, fostered an environment that allowed the teams to initiate networking activities and build relationships with their peers. All interviewed

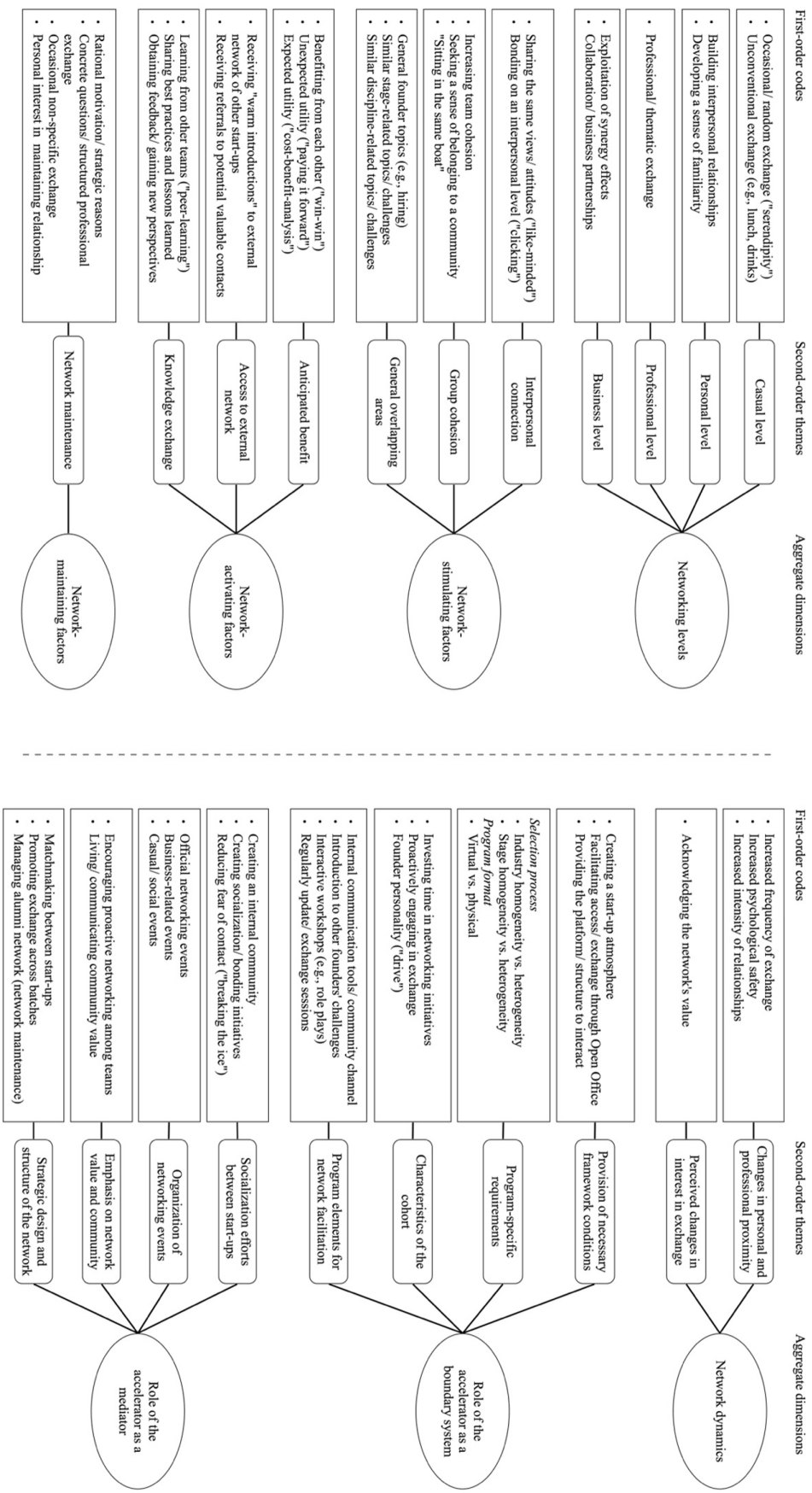

Figure 3: Data structure (Source: Own illustration)

start-ups confirmed that the individually attributed value of networking with other founders increased over the course of the program.

But how did networking efforts evolve from the teams' initial encounters to later points in the program? What individual attitudes underpinned the various forms of interaction and relationships? And what role did the accelerator team play in this context? In analyzing the dataset, distinctive patterns emerged that I considered relevant to understanding the phenomenon under study and answering the research questions. The relevant patterns were grouped into the following seven overarching themes: (1) *Networking levels*, (2) *network-stimulation efforts*, (3) *network-activating efforts*, (4) *network-maintaining efforts*, (5) *network dynamics*, (6) *role of the accelerator as a boundary system* and (7) *role of the accelerator as a mediator*. The respective patterns identified within the dimensions are presented in the following sections, along with an overview of illustrative statements that underpin the findings (Appendix 6 to 26). Subsequently, propositions and a process model are derived to allow meaningful contextualization of the research findings and to better understand the dynamics of network formation over time. To preserve anonymity, I replaced the program's official name with the fictitious name "X Combinator" in the following sections.

4.1. Networking levels

When analyzing the founders' statements about their perceived interaction mechanisms with other founders both during and after the program completion, I identified four different networking types that could be classified into the following dimensions: (1) *Casual*, (2) *personal*, (3) *professional*, and (4) *business level*.

Casual level

The *casual level* of networking refers to loose, unconventional interactions between teams or individual founders. Exchanges of this type mostly occur randomly and unplanned. The casual nature of this type of networking is reflected in the form of interaction, which is limited primarily to conversations before or after workshops, business meetings, or other program-related activities, as one of the founders put it: "It's just being in the [office] and you randomly see someone and it's like, 'oh, you want to grab lunch or how's it going?' [...] You have these bit more random conversations, which are also really nice" (S7). Irregular interaction could indicate a negative impact on the intensity of the relationship. However, when asked about the impact of this type of relationship, most founders did not confirm this assumption. For example, one founder reported an unconventional exchange with another team at the coffee machine, after which one of the team members shared personal contacts of the team's investors. Such incidents suggest that it is not necessarily the nature of the relationship that influences information sharing among teams. Overall, it appeared that, in fact, most of the relationships could be classified as informal, casual relationships that helped founders "break down barriers" (S4) and "facilitate communication after" (S4). A key difference I found in the data was that on-site founders, in particular, mentioned this type of relationship, as opposed to virtual teams, which experienced less daily interaction with teams due to geographic distance.

Personal level

As the name suggests, the *personal level* of networking refers to a type of connection that is primarily interpersonal in nature and closely linked to building trust and mutual emotional support. During the interviews, I noted that a personal relationship was less due to the start-ups' focus or thematic overlap but a result of personal interest or individual attraction to certain character types: "In the end, you make friends with people or not. I don't think it necessarily had to do a lot with the start-up they were doing" (S7). Overall, data revealed that, in particular, relationships that included both overlap in content and a personal connection was found to be most valuable for teams to support each other throughout the program.

When asked at what point personal relationships developed, informants agreed that the initial opening event essentially helped to build an emotional connection and establish a certain level of trust between the founders. The benefits of a personal relationship were particularly evident on a psychological level, helping founders "deal with stress and pressure" (O-M) throughout their entrepreneurial journey. Finally, a clear positive relation between personal connection among the teams and the longevity of the relationships beyond the program was found. In contrast, virtual teams developed fewer personal relationships relative to on-site teams. As already mentioned above, this may be due to the fact that virtually participating teams had fewer opportunities to attend in-person events and face-to-face interactions. Physical proximity thus seems to constitute an essential element for the development of personal bonding among founders.

Professional level

The *professional level* of networking forms the third category of network relationships and summarizes the professional-thematic interactions between teams or exchanges in the form of business-relevant information. In particular, program formats such as workshops or expert talks, which were thematically based on the given curriculum, served as a starting point for further content-related discourse among the teams: "We had different modules, fundraising, sales, business development, team building, and product [...] we structured the program systematically or strategically so that people then [...] exchanged ideas about a particular topic" (O-M). The bi-weekly update sessions between the teams to share progress and challenges proved particularly useful for sharing specific thematic issues with the teams. Founders noted that the thematic exchange was beneficial to get "different impressions" (S7) on open

questions of general topics such as "financing strategy" (S7), "accounting" (S2) or "hiring" (S9). Based on the interview statements, I observed that the thematic exchanges on a professional level primarily took place with founders who had "similar topics" (S1) or "overlaps" (S1) in terms of content.

Business level

> "There were two start-ups doing certain manufacturing of components. One of them was doing subtractive manufacturing, and the other one was doing additive manufacturing. And it happened that the additive manufacturing guys needed a piece of a certain material, they couldn't do with additive manufacturing. So they got it from the subtractive manufacturing, guys. So they both work together to please an external third party client. So that's, for example, another type of business relationship." (C1)

As seen from the above example, the *business level* of networking describes a business connection between start-ups. Business relationships within the accelerator program involved collaborations or partnerships between teams based on complementary skills, but also in "cross-hiring activities" (C2), when one team hired an employee from another team, which usually happened when one team did not perform as expected. One of the founders reported a possible collaboration with another team after the program: "It could be that we also do a project with [S5] after the program because it fits very well into our strategy. Without [X Combinator], I don't think the contact would have ever happened" (S3). Another founder mentioned considering teaming up with an alumni founding team to offer a "more differentiated value proposition in the marketplace" (S6). In addition, there were also instances where a start-up offered its product or service to another team, which was a common occurrence throughout the program, as reported by one of the coaches. Although business-level interactions accounted for the least amount of networking activity, founders overall confirmed that they could generally imagine potential partnerships with particular start-ups. Illustrative quotes of the different types of *networking levels* are summarized in Appendix 6, 7, 8, and 9.

4.2. Network-stimulating factors

After identifying four main categories of networking levels, I looked for emerging patterns in the different stages of relationship formation to assess potential changes in the course of the program.

Network-stimulating factors emerged as the first pattern in the data, describing the initiators or motivational reasons on the part of the start-ups for reaching out to other founders throughout the program. The main reasons for initiating contact can be classified into the following five groups: (1) *Interpersonal connection*, (2) *group cohesion,* and (3) *general overlapping areas*.

Interpersonal connection

Interpersonal connection defines an incentive to connect with certain start-ups based on interpersonal motives and shared beliefs. This type of initiator is evident mostly at the personal network level: "There are a few people that you just click [. . .] I think that's natural. I mean, same with you, you have a few friends, and those are people you click, it's nothing against the other people, it's just you simply click" (S5). Especially at the beginning of the program, initial relationships were built based on interpersonal connections rather than thematic overlap or personal interest in the other start-ups' businesses. Although personal relationships with start-ups were established primarily at the beginning of the program, some founders reported that as the frequency of contact with other start-ups increased, personal relationships continued to develop weeks later. This could be related to the fact that the start-ups communicated more openly with each other as the program progressed, allowing for similarities to be discovered among the founders over time.

Furthermore, one founder indicated that the perceived level of mutual sympathy and the interpersonal bond between teams also seemed to impact their willingness to collaborate throughout the program. In addition, private matters were more likely to be shared with teams with whom there was a personal relationship: "With some, we basically have a very friendly relationship because they're funny brands with whom you want to spend time together. [. . .] With them you feel more free to discuss private things, like, P&L and stuff like that" (S5). This was confirmed by another founder, who associated relationships based on interpersonal attraction with higher levels of trust than those he experienced with less closely connected teams.

Group cohesion

The start-ups' initiative to network with other founders within the accelerator was also related to their desire to feel part of a group of like-minded people, as one of the founders described:

> "One of the benefits of being part of the program is that you're actually part of the batch [. . .] you are together with like-minded people, you know, your friends do not understand, your family does not understand what you go through as a founder. People who are part of the batch do because they're doing exactly the same thing. So I think it's super valuable, the networking, and there's a lot of understanding between the founders." (S5)

From the team members' descriptions, it appeared that they initially felt a sense of loneliness upon entering the accelerator. The contact and networking with other start-ups

in a similar situation helped the teams overcome this subjective feeling, especially at the beginning of the program. The shared focus on overcoming individual challenges in a group created an initial bond between the founders maintained throughout the program. This involved not only supporting each other as a group in overcoming similar challenges, but also psychological and emotional support through a sense of "shared experience" (C2). The founders reported that the purpose of belonging to a group helped them not to lose focus during challenging times, indicating the motivational nature of a cohort, as one of the mentors put it:

> "At some point, there's a curve where it also goes down because then they realize that everything's a little bit more challenging than maybe suspected. And in curves like that, it's always good to meet other like-minded people and realize they're working too and they all have the same problem [...] this provides a very supportive platform for a team." (M)

Overall, the founders' responses indicated that the need for belonging reinforced the ongoing process of relationship building and the intensity of bonds throughout the program.

General overlapping areas

From the team members' descriptions, the degree of *general overlap* emerged as another key reason for reaching out to founders from other teams and similarly informed the intensity of interactions throughout the program. *General overlap* includes common issues start-ups face at the beginning of the founding process, such as how to "approach investors" (S1), what "hiring strategy" (C2) to follow, or how to set up the "fundraising" (C2) process. These types of similarities were cited as a good starting point for contacting other companies working on similar issues or who had previous experience in particular areas. Founders perceived sharing common start-up issues with other teams as helpful in benefitting from each other's experiences, as illustrated by one founder: "You go through certain topics, which every company goes through in the start-up phase, more quickly [...] and often more cost-effectively" (S8). One of the mentors pointed out that early-stage start-ups, in particular, seem to benefit from collaborating with other founders, as the problems "are all still relatively similar" (O-M), in contrast to later-stage start-ups, which require increasingly individualized assistance. In particular, the fact that most teams were in their early stages and thus faced similar challenges increased their willingness to reach out to other teams and talk openly about these issues. In addition, one founder noted that he was initially more attracted to founders who were similar to him in terms of their field of expertise: "Of course, it could be that I unconsciously focus more on these people right from the start" (S8). In general, it turned out that overlapping subject areas or similar areas of expertise significantly influenced the team's willingness to approach each other. Appendix 10, 11, and 12 provide illustrative quotes of the different *network-stimulating factors*.

4.3. Network-activating factors

Network-activating factors form the second category of inherent motivations for founders to form networks with peers. In contrast to *network-stimulating factors*, focusing on intrinsic motivations, network-activating factors describe strategic drivers for participation in network activities beyond the initial contact. These can be divided into: (1) *Anticipated benefit,* (2) *access to external network,* and (3) *knowledge exchange*.

Anticipated benefit

The *anticipated benefit* describes the willingness of the individual founder to build connections with other founders based on the perceived outcome of each relationship. Some founders reported building relationships with their peers without ulterior motives and offering frequent assistance without expecting anything in return, which one of the coaches defined as a "paying it forward" (C2) or "give first" (C2) mentality. This attitude was reflected, for example, in founders forwarding contacts to investors, sharing relevant templates, or providing targeted assistance for business-related topics. One founder shared an example of providing specialized support to another team that was less knowledgeable in a particular area: "We helped clear up the myth of T&Cs simply because we hired costly lawyers who solved the problem for us. And the start-up that asked us how we did the T&Cs now benefits because they can tell their lawyers much more detail about how they want it" (S6). In particular, respondents' statements indicate that start-ups were often willing to share their expertise with others who had less experience in certain areas without necessarily asking for compensation in return.

In contrast, there were cases in which founders only entered into a relationship when the mutual benefit of that relationship was evident, as one of the founders indicated: "They also know that they will benefit if they ever need something that you also help them in return" (S7). Knowing you will get something back indicates a certain level of trust, which seemed to be a fundamental requirement for the development of the relationship, as one of the mentors stated: "In the first phase of relationship building, trust has to be built. Trust as to whether the relationship is somehow reciprocal, that is, whether both benefit from each other, like some kind of win-win" (O-M). This form of reciprocal relationship was evident in internal program sessions in which teams gave presentations to each other and shared content or experiences they found valuable with the rest of the cohort. One of the mentors felt that this kind of connection not only helped founders inspire each other but to tackle certain "questions, topics, problems or challenges as a group" (M). Overall, the interviewees reported several scenarios in which start-ups had benefited from mutually supporting each other. For example, one of the founders of a hardware company mentioned

having helped with the installation of a hardware device for a software-oriented start-up. In return, they received advice on logistical operations, an area within which the other team was comparatively more experienced. It was interesting to learn that the idea of collaboration between teams seemed to be very strong within the cohort, which could be explained by the fact that the founders did not make any statements about competitive behavior throughout the program: "I think once you're an entrepreneur, you're part of a community and this is maybe not the last start-up I do. Maybe I'll do another one. Maybe it's with some of them, maybe not. I see it more as a community, you give and take" (S5). An additional example of the overall cooperative nature of the cohort was found in one of the other founder's narratives: "Some of them had finished pre-seeding right before us. [...] We then benefited from their pre-seeding experience. [...] We have adopted a lot of things that were recommended to us and have also recommended a lot of these things [to the other founders]" (A1). This example suggests that a reciprocal relationship may not necessarily be bilateral, meaning that knowledge was not inherently shared between two parties but at different levels within the cohort.

Access to external network

As an additional reason for networking with other start-ups in the program, founders expressed an interest in expanding their existing portfolio of relevant business contacts. Making new connections and gaining access to a broader network is usually considered one of the essential values of accelerators. Like the accelerator being an intermediary to the regional ecosystem, founders acted as brokers to each other's professional network contacts, such as customers, suppliers, investors, or other business-related contacts. In this regard, founders agreed that reciprocal "referrals" (C2) or "warm introductions" (S4) provided an efficient way to attract potential network contacts and facilitated access to relevant experts:

> "In the end, it's all about connections and about networks in the start-up world. So if you're a founder, the more connections you have, the better off you are. I think it's very cool that now, we know 10 to 12 different start-ups, who I hope will be in business for long, and then you can multiply or expand your network exponentially through others. It's really cool." (S5)

However, as most of the founders were still building on a relatively limited professional network, additional support from the accelerator team was considered relevant in this context to effectively connect the start-ups to the regional ecosystem.

Knowledge exchange

In addition to facilitating network expansion, founders reported the active use of concentrated expertise as one of the key factors in seeking networks with other founders. One of the informants reported initiating a regular roundtable for CTOs to discuss technology-related topics with founders from different teams to benefit from each other's experiences and expertise. Another founder explained that he was particularly looking to connect with teams that were slightly advanced in terms of maturity and expertise to adopt best practices and learn from their experience and insights. Interest in the experience and knowledge of later-stage start-ups included building relationships with alumni start-ups, as one informant reported: "You also can meet the start-ups from previous batches. [...] I think that's really nice because you get that expertise in a way, of people that have been in the same shoes that you are and then you just see them like one or two years later" (S7). In addition to bilateral technical dialogue, founders also cited the importance of networking with other founders for obtaining general information about relevant business tools, key channels for finding investors, or best practices for investment strategies. Similarly, founders reported formulating new use cases or improving their products or services through explicit ideas and tips from other start-ups within the cohort. One founder, for example, recounted a case in which another start-up made him aware of the applicability of his product in a new industry: "I didn't know they had this problem. And that's how we came up with this new solution" (S3).

Overall, the exchange between the teams seemed to be very open and cooperative throughout the program, which could be related to the fact that the teams did not see each other as competitors, allowing for an open exchange of experiences with other teams. A key benefit of sharing ideas at a professional level was learning from each other's mistakes or building on each other's experiences, to quote one of the informants: "After all, they all have similar challenges and everyone has already learned and tried something different and can pass it on. And then the others can learn from it much faster than if everyone has to make the same mistakes again" (MP). Illustrative quotes of *network-activating factors* are summarized in Appendix 13, 14, and 15.

4.4. Network-maintaining factors

Regarding the fact that the program was limited to three months, I was especially interested in the founders' intention to continue using their network relations established throughout the program. Since the second interview phase took place shortly after the end of the program, the data could only be based on assumptions made by the founders. However, I was able to gain further insight into the topic of relationship maintenance through additional interviews with alumni founders and informants from the accelerator team who had already supported several cohorts in the past. Overall, it became apparent that there were significant differences

in the founders' intentions and inherent reasons for maintaining their network, from personal interest to rational or strategic motives.

Network maintenance

The founders' personal interest in *network maintenance* was expressed in particular in their consideration of moving into a shared office with other founding teams after the program. One alumnus mentioned a few "intense relationships with start-ups" (A1) from his cohort, with whom he still regularly exchanges information, provides support, or passes on valuable contacts from his network. One of the mentors, who had worked in the accelerator for several years, reported some very close relationships between individual teams: "Even one or two years after the program, some of them are in daily contact. I know of one example, where five start-ups from one batch moved into an office space afterward because they wanted to continue to have this proximity to the other teams" (O-M). Some of the start-ups reported taking over the planning of networking events beyond the program to keep up with the other teams' journeys. In this context, one founder of the current cohort shared the idea of setting up a regular virtual coffee meeting to keep each other up to date on current topics and challenges, similar to the biweekly update sessions they took part in during the program. Other start-ups, in contrast, showed less incentive to actively maintain relationships but still expressed the added value of established relationships with other teams: "You know, these people are the future. So the fact that we know each other and we can reach out to each other, that's already a lot. We don't have to be best friends. But the fact [...] that we feel free to reach out, I think matters" (S5). Still others felt that without a given structure by the accelerator team, post-program exchanges would most likely become occasional. Finally, some start-ups reasoned that maintaining relationships with other founders was based on rational considerations, such as emerging collaborations, partnerships with start-ups, or perceived cost savings from sharing an office space. Appendix 16 summarizes the illustrative quotes of the *network-maintaining factors*.

4.5. Network dynamics

One of the primary goals of my work was to understand the underlying changes in network formation among early-stage founding teams. By interviewing the start-ups at the beginning and end of the program, several distinctive characteristics emerged about the dynamics of relationship formation, which can be further categorized into (1) *changes in personal and professional proximity* and (2) *changes in perceived networking value*.

Changes in personal and professional proximity

Compared to the beginning of the program, start-ups agreed that the frequency of exchanges between teams increased over the course of the three-months program. In particular, the bonds formed between teams at the beginning seemed to be sustained throughout the program. The first encounter between start-ups, in the form of a two-day kick-off event, was perceived by the founders as essential for building an initial bond between the teams that significantly influenced the further course of the relationship. This was also confirmed by one of the coaches, who observed that as start-ups became more familiar with each other over time, they began to "form typical, inner groups of people that like socializing, the ones that like drinking, the ones that go down smoking, the ones that are just talking about software architecture, the ones that are discussing high-level business" (C1). Besides the kick-off event, which constituted a core driver for relationship building and further network development, I could not find any other pivots in the data that significantly shaped the network, pointing to a relatively gradual process of relationship building. One founder noted that interactions between teams became more efficient over time, as people knew more about the other teams and were thus able to express concerns more specifically or reach out to relevant founders.

Regarding the changes in the intensity of relations, founders expressed different opinions. While only a minority of founders did not experience a significant increase in the intensity of relationships over time, most start-ups reported a positive correlation between the frequency of interactions due to professional or personal overlaps and the intensity of these relationships. Founders reported that relationships intensified the more they learned about the start-ups and their individual challenges. In addition, the data showed that interest in networking with other start-ups increased with the frequency of exchanges. This could be due to the fact that the increased interactions revealed commonalities between the teams, which they could build on over time, as one informant verified: "At the beginning, we didn't have a clue who our people are. [...] Given that we had more interactions throughout these eight weeks you do have the feeling you know people" (S5). Interestingly, one of the alumni founders indicated that the relationships in his cohort became looser and more isolated as the program progressed. This might suggest that the strength of the network equally depends on the individual characteristics of relationships among teams and thus of the cohort as a whole.

This is also in line with what one of the coaches reported in terms of ongoing network activity beyond the official program. According to him, sustained exchange seemed to strongly depend on the composition of the cohort and the underlying intensity of relationships between teams. One of the founders expressed a similar view: "I don't know if I would call them my friends [...] you just support each other and you follow journeys because you're on the same path, like a travel buddy. But, I don't know if necessarily after the journey, we will still be in that close contact" (S7). In addition, one member of the accelerator team reported an example of an "extremely close cohort" that met regularly after the program and proactively maintained intensive contact to maintain technical dialogue. Both statements reinforce

the accelerator team's assumptions about the longevity of relationships as a function of relationship intensity as well as the interpersonal bond built during the program. This was also confirmed by an alumnus reporting on his existing relationships with start-ups with whom he had a very personal relationship and who followed a similar business philosophy to his team. One interesting finding was that despite the continuity of the relationship, the frequency of exchanges decreased significantly after the program. This could be partly related to the fact that start-ups spend less time on networking activities after the program or an indication of the need for long-term networking support from the accelerator. In addition, one alumnus reported the decreasing frequency of exchanges after the program due to the lack of proximity to the start-ups.

The most significant differences in relationship development throughout the program were found between on-site and virtual relationships. Overall, both the frequency and intensity of relationships with virtual teams were uniformly classified as generally weaker by the founders.

Perceived changes in interest in exchange

The *perceived changes in interest in exchange* emerged as the second category when examining the dynamics of the network process. This category describes the increasing recognition of network benefits that emerged among start-ups as the program progressed.

> "It was just when we were still in the pre-seed phase, still very early, I wasn't such a networker, I didn't quite realize how important networks actually are, but then in the stage where we are now, pre-market. That's an optimal place to connect about the same topics that you have in the start-up." (A3)

When asked about the founders' primary motivation for participating in the accelerator program, networking with other founders was rarely mentioned, as one of the founders' statements illustrates: "I didn't mention it [...] because I think it's lower on the priority list. That's not to say it's completely irrelevant, but it certainly hasn't been a deciding factor in applying for [X Combinator]" (S2). Similar statements emerged from the interviews with other founders, who also rated the aspect of the founder network as less relevant. This was partly explained by the lack of knowledge regarding other teams' business models and thematic challenges. In the second round of interviews, the start-ups rated the added value of the network comparatively higher than at the beginning of the program. Founders stated that their interest in the network changed over time when they recognized the added value of exchanging ideas and benefitting from each other's know-how. Informants on the accelerator team also confirmed that the founder's awareness of the value of community was typically not present in the early stages of a start-up. However, the managing partner reported that at the end of the three months, founders frequently named the peer network as the most important added value of the program. A possible explanation for this could be that teams seem to be initially unaware of the thematic overlap with other start-ups and only realize the potential of mutual support over time. Therefore, increasing knowledge about the teams can be classified as a crucial factor influencing the personal perception of the founder network's value. Illustrative quotes of the *network dynamics* can be found in Appendix 17 and 18.

Having explored (1) why and how entrepreneurs interact with other start-ups and (2) how the nature of relationships may change throughout the program, I now elaborate on the role of the accelerator in the context of start-up relationship formation to report on the necessary framework conditions and strategic mechanisms and how these relate to the outcomes of founders' dynamic demands. This serves to answer my third research question: *How does the involvement of accelerators impact the process of relationship building between founders?* As can be seen from my data, accelerators can take on two primary roles. The role of the *accelerator as a boundary system* deals with the underlying conditions necessary for the possibility of network formation, while the role of the *accelerator as a mediator* derives from the practical strategies and reactive activities of the accelerator to the demands of the start-ups.

4.6. Role of the accelerator as a boundary system

Provision of necessary framework conditions

> "We are the orchestrators. So I mean, if we're not there, how are they going to meet, right? We're going to put the excuse event where everybody can join. Who's gonna show them that there are more teams coming, stepping on their steps and standing on their shoulders. What's gonna motivate them to keep saying we were part of [X Combinator]. [...] So we want to make it present because if the incubator is gone [...] who is gonna put them together - nobody." (C1)

The entrepreneurs interviewed agreed that the existence of the accelerator and thus the provision of the framework conditions, including the accelerator environment, was an indispensable prerequisite for forming a network among founders. With regard to the provision of the platform conditions accelerators seek to offer, one of the start-ups' coaches confirmed that the program constituted the main reason for the start-ups to come together. "Without [...] this program, they would have no reason to come together in the first place. So basically, the relationship wouldn't exist at all" (C2). In this context, however, it was also emphasized that the given structure of the accelerator and the involvement in relationship building should be designed in a way that "it is easy for people to interact" (S5) but still allows room for

flexibility and proactivity on the part of the start-ups (S9). This flexibility seems to be provided by the openly designed accelerator environment. In particular, the shared office space offered the start-ups an unconventional atmosphere that enabled the teams to exchange ideas outside the structured program content. When asked to what extent there were differences between the start-ups' on-site relationships, most respondents pointed to the closer relationships and more frequent interactions with their immediate seat neighbors. At the same time, the open environment encouraged teams to occasionally meet with different founders, "join in on a conversation" (S8) or spend time together "beyond their working hours" (C1). Finally, the accelerator setting conveyed an inspiring start-up atmosphere fostering motivation and inspiration among the teams: "It's super important [...] just for motivation or inspiration, it's also important to see what the other founders have achieved" (C1). Another informant confirmed this view: "Well, I think it's, you get this feeling that people come early, stay late. I think you get this feeling that people are working hard, and then you are also motivated to work harder [...] that's a positive thing" (S5). Overall, the open-space climate allowed the teams to follow the progress and daily activities of the other founders, which ultimately increased overall "motivation" (A3), kept "morale" (A3) high and allowed new "perspectives" (S9) to emerge.

Finally, teams indicated that the structure at the beginning of the program was critical to ensure that start-ups had an "initial incentive to connect" (S7), which would "simply take way more time" (A1) to achieve naturally. At the same time, accelerator support still seems to be important later in the program, after founders expressed that they were often overwhelmed with the increasing "start-up hype" related to the maturation of their start-up. However, beyond providing the networking platform and associated structure, one of the start-ups' mentors questioned the program's role in terms of its impact on "how relationships are shaped in depth" (O-M).

Program-specific requirements

An important aspect of examining the role of the accelerator is the program-specific selection process and thus the formation of the cohort to assemble a specific group of founders. The selection process is not only important for obtaining financial sponsorship or increasing overall innovation capacity but also has a significant impact on building collective social capital during and after the program. It is therefore critical in that it can channel early access to new and non-redundant information. Analyzing the data, I found that the level of interaction between teams depends in part on the format of the accelerator, which essentially falls into the following three categories: (1) Niche or generic, (2) stage heterogeneous or homogeneous, and (3) physical or virtual. In addition to these format-related categories, cohort size also appeared to affect the level of team interaction.

The overall difference observed across the first category is reflected in the characteristics of niche accelerators that select teams with a sense of "uniqueness on their way they do things" (C1) and allows to "distinguish them from [...] other companies" (C1) relative to a generic program that does not follow a specific theme. Since the identified case is a technology-focused accelerator, teams are selected based on their technology product or service, combining different industries such as DeepTech, MedTech, Robotics, or AI, as well as different focuses in terms of hardware or software. In this context, one of the managing partners of the program explicitly pointed out the importance of technological heterogeneity, which was deliberately sought to help teams "get out of their bubble, talk to other teams" (MP) and "broaden their horizons" (MP) in terms of expertise and topics. One of the mentors also emphasized the emergence of natural "variance" (M), which, in addition to content-related diversity, can also be achieved through a heterogeneous "personal composition" (M) of teams, bringing together "more experiences, characteristics, ideas, motives, and competencies" (M) and raising the overall learning curve across teams. Surprisingly, unlike what was mentioned among informants of the accelerator team, some start-ups did not perceive this type of selection strategy as conducive to relationship building, mutual interaction, and the emergence of synergy, as put by one of the founders: "For us personally, it would have been better if there had still been companies operating in a similar field to ours. Either in terms of the market or the technology" (S2). He further argued that "if, for example, we had another 14 game studios here, neuro tech or any AI companies that are much closer in terms of technology or content to what we do, then there would certainly be some kind of cooperation that could be pursued further beyond the program" (S2). Another founder agreed with this view due to lower overall "strategic engagement" (S6) among start-ups but noted that having too many similarities between teams would "probably make the exchange less open" (S6). Overall, however, a clear tendency emerged between the different views. The diversity of the teams in terms of market and industry proves to be beneficial in terms of an "open exchange" (S6), reduces the potential of "portfolio conflicts" in the form of competitive thoughts among the teams, and enables the flow of new information. Simultaneously, however, there has to be some form of overlap in terms of similar challenges and issues to be able to discuss general topics on an abstract level and to benefit from the experiences and feedback of multiple "sparring partners" (S9). This goes hand in hand with what founders noted when asked about the impact of different maturity of teams. In particular, the similarity in needs of the start-ups in their early stages allows for an open exchange on industry-independent topics, as one of the founders noted: "For our start-up, I think it was helpful the brainstorming sessions with other start-ups on funding strategy and all of those things. Because then you kind of at the same stage in your start-up and just getting like another perspective [...] and just really chatting openly about it to someone else that is also kind of in your shoes and understands what you're actually going at" (S5). From a strategic point of view, the accelerator team also ensured that all groups were, on average, at a similar stage by delib-

erately hosting "a few earlier-stage teams" (MP) and "a few later-stage teams" (MP) to encourage the flow of knowledge and experience among them.

In addition to the effects of industry and phase-related factors, the data analysis revealed differences in the intensity of relationships and interactions depending on the physical proximity or distance of teams. Overall, sharing a physical space resulted in more frequent and intense interactions between founders on-site than between founders who only participated in the program virtually. In particular, virtual participation prevented unconventional and unstructured opportunities for exchanges in the hallway, at "the coffee machine" (S1), or over "lunch" (S3), that only happened between the on-site teams, through which more informal relationships could be established. The teams that were primarily on-site reported that they had few interactions with the virtual teams because they were simply not "on top of [their] minds" (S5), whereas the connections with the on-site teams became "much closer, more collegial and friendly" (S2) over the course of the program. One founder, who was only able to participate virtually, lamented the lack of closeness to the other teams: "They have these jokes and stuff where you just notice they've spent time together [...] So I think definitely virtual interactions are not as strong for relationship building. [...] I do see it as a disadvantage that I'm not here" (S7). Also, from a psychological perspective, the on-site interactions seemed to significantly impact interpersonal bonding which, according to the founders, had a considerable effect on the strength and maintenance of relationships after the program. In this regard, the accelerator team stressed that a personal bond between participants needed to be established early on to counteract the disadvantages of a virtual setting as efficiently as possible. X Combinator thus introduced an obligatory offsite event at the beginning of the program exclusively to facilitate networking among the start-ups: "Once you've established this bond, which usually works out quite well in two days, they'll stay in touch virtually as well. But you need that in-person contact once, especially at the beginning of the program" (MP). One of the mentors agreed that the development of relationships in a virtual environment would "take much, much longer" (O-M) and make the exchange between teams "less intense" (O-M) than in a physical environment. This highlights the accelerator's function as a broker between start-ups, facilitating networking and exchange, especially between virtual teams.

Finally, the size of the cohort was mentioned as crucial for the exchange, which was summarized by one of the mentors as follows:

> "In my opinion, there is a pareto optimum, which means that too large does not work, because the teams then simply lose the overview of who is doing what, who is facing which challenges, whom can I approach with what [...] and the other side is, if the batch is too small, then you simply have too little overlap of topics, and challenges. In other words, size plays a very important role in my opinion." (O-M)

At the time of the survey, the accelerator comprised 15 start-ups, half of which participated remotely and the other half on-site. When start-ups were asked how satisfied they were with the current size of the cohort, most of them agreed that a larger group could lead to "more professional overlap" (S4), while making it more difficult to "get in touch with everyone" (S2).

Characteristics of the cohort

Consistent with the selection of teams by industry or stage is the *characterization of the cohort*, which can substantially influence the intensity of interaction between founders. This second-order concept essentially comprises the personal attitudes and founder types and the associated proactivity in terms of relationship building with other founders or founding teams. The data suggest that the extent and depth to which connections are formed depends in part on the founders' personalities and interest in other start-ups, as one of the coaches expressed as follows: "You just know that if you hire the right people, the place will run. If you hire the wrong people, it won't run" (C2). Whether a founder is "socially outgoing [or] sharing" (C2) cannot be measured by specific rational criteria, but much more on "human intuition or empathy" (C2) on the part of the accelerator team, which defines the personalities of the founders as a key selection criteria for participation. In this context, it is necessary "just to [have] a few people in the batch who drive [social events]" (MP). Not only the motivation to interact socially with each other was considered a key role, but also the founders' willingness to exchange ideas and share their knowledge with other teams openly. One start-up also noted that in each cohort, "there is always someone in the start-up [who] is responsible for networking and just likes to get everyone connected and likes to address everyone" (A3). The accelerator plays a comparatively subordinate role, as illustrated by the statement of one coach: "So it varies a lot, we just offer the possibility for them to do it and foster these activities. But not everybody's willing to help everybody, but we try to make it happen" (C1). This suggests that the role of the facilitator is required not only within the accelerator team but also within the cohort to ensure bilateral exchange even without active engagement on the part of the accelerator. A different level of proactivity was also found between on-site and virtual teams, with the main factor for lower proactivity primarily attributed to "physical distance" (S9). In addition, some informants among the start-up teams cited insufficient free time as a barrier to personal engagement and building relationships through own efforts. One of the founders noted, "maybe at some stages, you notice that there's other priorities. For example, if it's a very intense stage for a start-up, you will notice that they are less active in these meetings or contribute a bit less, or don't do the networking sessions or whatever" (S5). This difficulty was also acknowledged on

the part of the accelerator team. According to the feedback of the managing partner, it is essential to "convince the teams that [networking] is worth their time" (MP), which often proves challenging, especially for start-ups at a later stage. Also, in this context, the accelerator team emphasized the importance of early bonding between teams, which allows the "relationship, once established" (O-M), to be "leveraged in the future" (O-M) while minimizing the amount of time spent on networking activities. At the same time, a flexible and time-limited program structure also offers teams the opportunity to participate in networking activities according to their available time in order to make relationship building as efficient as possible. Due to time constraints, many interactions happened "door-to-door" (S2) without start-ups explicitly leaving room for networking activities. In contrast, some start-ups proactively and independently organized social events or activities such as bar evenings or thematic get-togethers outside the accelerator setting.

From the overall results, it can be deduced that the difference in proactivity is not only determined by the motivation and interest of the founders but is also a function of different personality types.

Program elements for network facilitation

In addition to the program-specific requirements and the strategic composition of the cohort, X Combinator offered several measures to make it easier for the founders to engage with each other. For example, there was an online communication tool that teams could use to chat with each other or ask specific questions. This was evaluated as a straightforward way for the teams to communicate with each other. In addition to the program-internal channel, there was also a separate mobile application that contained the company profiles of the individual teams, which could be accessed "if [the teams] were looking for something particular" (S8). In addition to listing the company profiles, the accelerator also ensured that teams were regularly informed about the individual challenges and current status of the other founders in bi-weekly stand-up meetings: "So once they are selected, we make them interact more with each other, we have different parts of the program including a presentation from the start-ups to the start-ups, they have the stand-up, they talk to one another" (C1). One of the mentors added that it was essential to introduce the teams to each other: "If the teams know what challenges the individual start-ups are currently facing, they can better assess what specific questions they need to approach the teams with" (O-M). The founders' feedback on the regular update sessions varied. Some of the informants found it helpful in so far as "to better understand the idea of other start-ups" (S10). Others, however, criticized the lack of time in the sessions as well as a pure "working through and reporting things" (S1), which prevented the teams from "dealing with [the problems] in detail" (A2). The lack of structure on the part of the accelerator suggests that these sessions were primarily for the start-ups to help and proactively reach out to each other, which was confirmed by one of the founders: "If you think you can use or need support, you can just reach out to the pool [of founders], do the deep dive, and explicitly ask for [help]" (S6). Overall, start-ups perceived the regular exchange sessions as "good for building relationships" (S7) and allowed teams to share ideas and provide targeted support.

In addition to the stand-ups, workshop formats provided another starting point for founders "to open up, present their challenges to each other, and thus build relationships much more quickly" (O-M). One X Combinator coach reported that such sessions also serve as a foundation for further conversations about the topics discussed: "It's like going to the movies or meeting friends and then talking about it" (C1). Another informant of the accelerator team emphasized the importance of interactive workshops in strengthening relationships. He argued that workshops provided a setting to discuss intimate topics that "probably don't get talked about as much at a pizza night" (M) but are "crucial for further exchange" (M). He explained that superficial topics are usually discussed in the context of unconventional "pizza or beer nights" (M) while addressing deeper issues requires mentor guidance to truly create "value" (M) and "connection" (M) between teams. In particular, sessions with interactive elements such as role-playing provided a way for teams to get closer and "build a personal relationship" (S8). As one of the founders pointed out: "On the first day, one will play a role, the other person would play a different role [...] you get to meet each other in a completely different setting" (S5). This type of interaction encouraged the start-up teams to not only "step out of their comfort zone" (S8) but to solve tasks collaboratively and thus strengthen their personal bond. Illustrative quotes of the *role of the accelerator as a boundary system* are provided in Appendix 19, 20, 21, and 22.

4.7. Role of the accelerator as a mediator

In addition to the necessary but rather passive *role of the accelerator as a boundary system*, a closer look at the data revealed an active role on the part of the accelerator in strategically shaping the network and actively responding to the needs of the start-ups. As evident in my data structure, the *role of the accelerator as a mediator* underlies four second-order themes: (1) *Organization and management of networking events, (2) socialization efforts between start-ups*, (3) *emphasis on network relevance and community* and *(4) strategic design and structure of the network*.

Socialization efforts between start-ups

Socialization between start-ups describes measures to promote personal interactions between the teams, intended to draw the start-ups closer together and break down initial barriers. Ongoing socialization is an integral part of the program and seemed particularly important at the start of the program. Socialization is not only about introducing the start-ups and each other' challenges, but also about spending time together over an extended period of time to "build a community" (O-M) and "create a bond within the group" (O-M). The

teams should be given the opportunity to get to know each other, find out what they have in common, and overcome any fears of contact, as one of the founders described: "What was very good about the program is that the whole event began with this offsite. First of all, there was a very informal atmosphere where everyone could meet on an interpersonal level. And from then on, 80% of the inhibitions were already gone. And people knew each other, they shared the same bedrooms. I think that was a strategically good move by [X Combinator]" (S2) and had a significant impact on how "the dynamic developed over the months" (S2). One of the founders described the event as a type of "speed dating event on a networking level" that helped "break the initial ice" (S2) and "reduce the fear of contact with the other teams tremendously" (S6). The founders agreed on the importance of the "informal, fun setting" (S7) of the kick-off event, which motivated the teams to also talk about "personal things" (S7), to "open up more easily" (S10) and to build "more intense relationships" (A1). One of the founders added that the social meetings at the beginning were important to "better understand the ideas of other start-ups" (S10) in order to reach out to the teams in the further course.

Overall, the data suggest that the progression of relationship intensity and frequency of interactions over the course of the program can be explained in part by the initial socialization of the start-ups, a point confirmed by one of the mentors: "We found that it took much, much longer when it couldn't happen at Corona times. The exchanges were much, much less intense than in those physical batches" (O-M). Another informant emphasized that, overall, physical proximity to the other teams was crucial in this context: "Again, the fact that they took us away to meet and to create a bond from the start, I think that was crucial [...] that's where everything started. We got to know each other, and then we build upon that through the program" (S5).

Organization and management of networking events

The accelerator's measures of team socialization were closely tied to the data that fall into the category of *organization and management of networking events*. In this context, X Combinator places great emphasis on hosting different types of events specifically designed to build and strengthen the internal network and relationships among founders. These events range from casual social gatherings to structured networking sessions to formal business-related events, as one of the mentors explained: "So our networking events are not necessarily just serious events in which they pitch, or they do some formal activities, we always combine them with social events. Dinner, evenings, pizza evenings, drinks, evenings, games. So there is always a socializing factor so that they can get to trust each other" (C1). Opportunities for founders to interact on a social and unconventional level proved particularly helpful in building personal connections and fostering open exchange. With respect to the value of social interactions, one informant noted: "I think it helps the most when we can talk informally with the start-ups in the evenings, because then everyone is a bit more open than when it's immediately clear that it's about a business topic" (S9). Often, the social gatherings were scheduled after more formal meetings or workshops, so start-ups were encouraged to continue discussing the topics in a more informal setting, as one of the founders reported: "We also do a lot of things together in person, also after the networking sessions, just having a beer and pizza and whatever. [...] I think a lot of personal relationships are built up [...] and you just talk on another level with people" (S7). Furthermore, founders reported that also successes of individual teams were frequently celebrated in a joint unconventional setting when, for example, "a start-up closed a financing round" (A1). Celebrating each other's achievements showed the cohorts' strong community spirit and commitment to motivate and support each other.

In addition to the unscheduled social formats, the X Combinator team organizes a series of mandatory networking events specifically focused on "community building and peer exchange" (MP). In particular, an opening event at the beginning of the program, during which the teams spend two full days outside the accelerator environment, serves as a way to get to know each other and make initial contacts with other founders. As already evident from the previous data, the personal bond between the founders, which is often built during these first days, seems critical to building initial trust and further intensifying relationships throughout the program. In addition, founders have the opportunity to exchange ideas and benefit from the experience and expertise of other founders at more formal events. One such event aims for start-ups to "prepare a presentation [of something] they have found valuable" (C1), "organize a thematic roundtable [...] play a game or [...] anything to promote the community idea" (MP). This approach was consistently found to be particularly helpful by start-ups. Here, too, the active role of the accelerator as a facilitator becomes clear, as one of the founders confirmed: "The incentives were set very clearly, you just had to accept them" (S2).

Emphasis on network relevance and community

In addition to organizing and managing events to actively connect the cohort, a key aspect of the accelerator's role seems to be motivating the teams to independently build relationships with each other during the program. In this context, a key concern of the accelerator was to help the start-ups understand the value of networking with each other from the beginning, thus encouraging proactive exchange between teams: "We always strongly justified the community aspect at the beginning. That's also part of our value proposition that we promote and that we then also emphasize very strongly in the intro events [...]" (O-M). In this sense, the main added value of the communication was to articulate the benefits of a community to the start-ups. One of the coaches emphasized that the value of community "is perceived as relatively irrelevant, at least at the beginning when they haven't experienced it yet" (C1). He went on to say: "We actively encourage

them so we keep them informed on what's happening [...] all the available events and we invite them to participate" (C1). The perceived necessity of encouraging teams to engage in mutual networking may be due to the fact that most teams were participating in an accelerator program for the first time and, therefore, had no prior experience in a similar setting. This was also evident in the participants' statements when asked about their initial reason for participating in the program. Teams that had already been part of a funding program noted the added value of building relationships with other start-ups. In contrast, some teams indicated access to the network of investors, partners, and customers as the primary reason for joining the program while assigning less value to connecting with other start-ups. The managing partner also confirmed the different views on network value among the teams: "At the beginning, you still have to force them to actually exchange information. And that is our role [...] so that they realize the value and then continue from there" (MP). In this context, she also noted the difficulty of fostering virtual teams in the same way: "On-site, if you have to, you can get them off their desks and say, 'so, we're going to have a stand-up and you're going to enjoy that eventually'" (MP), which "is not possible with virtual teams" (MP). Equally important seemed to be the insider role of the mentors and coaches, who worked closely with the teams and, therefore, often recognized "content overlaps" (M) or "synergies" (S10) between the founders much earlier. This was also confirmed by one of the cohort's informants: "It's like, 'oh, you know, I just talked to them', and then you have connections. So I think that the mentors and the coaches, they play a vital part in the formation of the networks" (S7). Fundamentally, however, the accelerator team sought to ensure the start-ups' independence and often only encouraged dialogue between the teams without actively connecting them.

Strategic design and structure of the network

Although start-ups were incentivized to network independently throughout the program, data analysis revealed some actions on the part of the accelerator that can be classified as deliberate *strategic design and structure of the network*. Strategic network structures in this context refer to the accelerator's efforts to connect teams precisely according to their technical expertise, thematic overlap, or experience in order to ensure targeted exchange. As one of the mentors mentioned: "The more precise and better matchmaking takes place, the better challenges can be overcome" (O-M). Matchmaking describes the process of bringing together two or more teams that the accelerator expected to maximize synergy and mutual support. One of the coaches provided a tangible example:

> "I happened to learn that they have [X] as a common investor and that they are both active in the tech industry and [...] could maybe learn from each other or even work together, [...] that's such a great match, [...] and then you get the ball rolling. And then all of a sudden, they're in their little world, and of course, they're now working closer together and regularly talking on the phone." (C2)

He further noted that in some cases, the accelerator's intermediary role may even extend beyond the internal network by facilitating relationships with external founders who are operating in the same industry, offer a similar product or service, or are already at an advanced stage and willing to share their experiences with younger founders. He argues that "proactively identifying the needs of founders and then connecting them with the community in a way that adds value to one or both sides" (C2) is a crucial part of the process. Regarding the efficiency of matchmaking, the founders' feedback was mixed. One founder, in particular, criticized the potential creation of "dependencies" (S4), especially when creating partnerships between start-ups, which he experienced within another accelerator program. In contrast, specific formats that brought together groups of founders with thematic overlaps were felt to be helpful in "facilitating conversations" (S10) and "enabling knowledge transfer" (MP). However, one of the founders felt that thematic exchanges needed to be structured in a way that allowed for "discovering the specific problems as efficiently as possible, defining them and articulating them in an appropriate framework, in order to discuss" (S1) them efficiently.

Matchmaking occurs not only within the current cohort but also across cohorts, allowing younger start-ups to connect with start-ups von previous cohorts. One way to create this exchange is for later founders to share their experiences with current teams through "workshops, talks, or one-on-one mentoring" (C2). One of the founders observed that it's not so much the idea of connecting start-ups at the same stage that adds value, but rather the contact with experienced start-ups "that are maybe a year or two ahead of us, because they went through the things that we are going right now" (S5). He further noted that alumni support would represent a form of "paying back" (S5) toward the accelerator "to help the next generation of founders" (S5), reflecting his intention to stay in touch with the accelerator and the teams even after the program. In this context, however, he stressed the need for efficient design of exchanges, especially in view of the lack of time:

> "In reality, I have a business to run day to day. So this is the top priority, but given that I was helped, I'm more than willing to pay back and as long as it's made easy for us to do so. I think that's maybe what [X Combinator] should focus on. [...] Don't ask me for 10 times one-hour meetings, but actually, invite me at an event and I will then mingle with these people and share everything I know." (S5)

The data showed that founders disagreed on what constituted accessibility to alumni teams. Some founders pointed to the relatively loose contact with alumni and blamed it on

the lack of support from X Combinator, while other founders felt no difficulty making contact on their own. In terms of wanting to get alumni teams more involved in the program, one of the founders had the idea of creating a "space [for alumni]" (S2) to facilitate access to the teams while "serving as motivation" (S2) for the younger start-ups. Overall, most start-ups felt that alumni teams were generally willing to share their experiences with younger founders and were responsive to their questions.

The accelerator team not only provided start-ups with the opportunity for cross-cohort exchange but also emphasized relationship maintenance and follow-up support, as one of the coaches noted: "it poses an opportunity for them to reconnect again. [...] At least we give them an excuse to come by and say hi to each other. [...] So they get to interact for as long as the accelerator is still alive" (C1). Some start-ups frequently remain close to the accelerator after participating in the program by joining another related program, allowing them to maintain contacts more easily. Other start-ups often decide to move into a joint office or to cooperate in some way after finishing the program, although this is mostly arranged bi-laterally between the teams, without active support from the accelerator side. However, alumni find the events organized by the accelerator team helpful, as they provide them with a framework for long-term exchange. After the three-month program, start-ups also have the option of extending their stay at the accelerator and using its facilities for an additional three months. However, the intensity of relationships did not seem to increase significantly in this context, which could be partly explained by the founders' increasingly busy schedules. Appendix 23, 24, 25, and 26 summarizes the illustrative quotes of the *role of the accelerator as a mediator*.

4.8. Propositions and process model development

The results underlie the seven aggregate dimensions presented in the data structure. In essence, they provide insight into (1) how start-ups proactively develop networks with other founders and the motivations underlying network development, (2) the ways in which different network connections are strategically leveraged and change over time, and (3) the role of the accelerator in network formation to effectively and timely respond to the relevant needs of start-ups. Based on the analyzed results, I derived four main propositions.

Dynamic networking behavior

As I sought to understand with whom, when, and for what purpose the entrepreneurial teams networked during the interviews, it became clear that the configuration of relationships and interactions over the course of the program was related to each team's inherent motives at a particular point in time. Through closer analysis of the interviewees' statements, I found that the process of networking could be broken down into three major phases. As already evident in the data structure, these can be delineated based on *network-stimulating*, *network-activating*, and *network-maintaining* motives, which are determined by the inherently different requirements on the part of the founders. Based on these findings, I argue that

> **Proposition 1** - P1 (Network Stimulation, Network Optimization, Network Maintenance): *Networks among early-stage founders transition through various stages of formation to accommodate shifting organizational demands and challenges over time.*

Strategic Network Management

Furthermore, the results of the data analysis suggest that the accelerator plays the role of a powerful connector between the start-ups in an ecosystem by creating a protected environment that encourages actors to collaborate, share knowledge, and exchange information. What looks like a passive assembly of individual actors is based on the idea of active cognitive navigation between complementary know-how and behaviors that holistically strengthens the overall value of entrepreneurial connectivity.

The data suggest that the upstream selection process, and thus the strategic formation of a cohort of founders, enables the efficient coordination of complementary knowledge and skills. In addition, the accelerator's case-by-case assessment of whether a team fits into the overall founder network strengthens trust among founders and a sense of collective identity beyond the accelerator's boundaries. From these results, I deduce that

> **Proposition** - P2a (Network Composition): *Strategic network composition is an effective tool to filter qualified start-ups based on their network fit to ensure targeted interaction among founders and catalyze long-term connectivity.*

As described by informants, founders seek to dynamically align their peer network connections with their perceived needs. However, early-stage founders, typically face the difficulty of anticipating strategically valuable relationships based on unpredictable challenges (Engel et al., 2017). At this point, the responsibility shifts to the accelerator, whose insider role can align the interests of one founder with the experiences or capabilities of another. In other words, the accelerator's expertise in strategically connecting start-ups contributes to optimized network formation and thus effective exchange and collaboration among founders. I, therefore, suggest that

> **Proposition** - P2b (Network Orchestration): *Matchmaking between start-ups constitutes a cognitive mechanism for enhancing the efficiency of entrepreneurial networks and ensuring a facilitated flow of information between founders.*

Socialization Incentive

While strategically motivated connections among start-ups are associated with reciprocity in exchange processes, intrinsically motivated connections form the basis for personal ties that create trust and emotional bonding. As the informants' statements indicate, professional-level connections, that is, calculative relationships, emerged temporally only after the start-ups had connected on a personal level during the initial encounter. This suggests that strategically motivated exchange dynamics between start-up members are usually a downstream event in the development process that requires a previously established form of interpersonal bond between the start-ups. Moreover, the data showed that the regularity and intensity of the relationship were based not only on professional compatibility but also on personal connections between the founders. This observation underscores the importance of fostering early social interactions to strengthen interpersonal bonding. These findings lead me to conclude that

> **Proposition** - P3 (Network Activation): *Mediating early network formation among early-stage founders increases the likelihood of interpersonal bonding and thus the frequency and intensity of mutual collaboration over time.*

The propositions derived from the results can be presented as a dynamic input-output model of inter-firm network formation. The process model shown in Figure 4 depicts the various phases of network formation in chronological order. In practice, the boundaries of the phases may not be as discrete, suggesting possible shifts or adjustments depending on the particular context. For example, relationships at the business level are not necessarily limited to the network maintenance phase but may already be formed earlier in the process.

The interaction dynamics between the founding teams at the different networking levels form the core of the model. *Start-up inputs* describe the intrinsically and extrinsically motivated incentives of start-ups (*initiators*) to build connections with other founders. *Accelerator inputs* represent the strategic mechanisms (*initiatives*) designed in response to the start-ups' expected needs and specific circumstances. Finally, the *accelerator output* comprises the corresponding outcome obtained through the different types of connections within the overall founder network.

The applicability of the model can be illustrated with a simple example (highlighted in blue in the model): At the beginning of the program (*stimulation phase*), most start-ups are confronted with a new situation in which they primarily seek contact with like-minded people in their immediate environment (*start-up input*). Accordingly, strategically initiated socialization, in the underlying case, the opening event at the beginning of the program (*accelerator input*), helps to create early interpersonal connections between the founders. Ultimately, these initial connections create an emotional bond and mutual trust between teams (*accelerator output*) that builds the foundation for deeper connectivity.

The theoretical and practical implications of the theses developed, and the process model will be examined in more detail below.

5. Discussion

The goal of this thesis was to develop a deeper understanding of different types of relationships between early-stage founders and the associated *dynamic changes over time: How do early-stage start-ups form, use, and develop relationships with other founders? How does the importance of different relationships change in light of the dynamic nature of entrepreneurial activity? And how does the involvement of accelerators impact the process of relationship building between founders?* This research not only examines the procedural dynamics in developing relationships between start-ups but simultaneously challenges the effectiveness of contemporary support programs for entrepreneurs.

Positioning the accelerator at the meso-level of analysis allowed me to examine its intermediary role between the network's actors. Studying a realistic case in its natural setting was consistent with the overall goal of studying the process and associated temporal dynamics of inter-organizational relationship formation among start-ups over time (Denzin & Lincoln, 2011). Semi-structured interviews with founders and representatives of the accelerator team formed the basis for an inductive, qualitative research study.

The developed theoretical process model represents a significant contribution to the vast literature on entrepreneurial networks and provides valuable guidance to the new generation of ecosystem designers, policymakers, and prospective entrepreneurs. In the following section, I outline the implications and assumptions derived from the results before presenting limitations and suggestions for further research.

5.1. Theoretical implications

The results of the underlying study provide a number of insightful findings for the broader academic literature on entrepreneurial networks and the nascent field of accelerator research. Overall, they expand the definition and understanding of social founder relationships and illustrates the complementarity of networks in entrepreneurial processes.

First, they conceptualize entrepreneurial networking as an inherently adaptive behavior of individual actors along the entrepreneurial process. Much of the prevailing empirical research emphasizes the centrality of networks in all stages of the entrepreneurial process (Stuart & Sorenson, 2007). However, most of the literature on entrepreneurial networks has focused on defining the structural characteristics of entrepreneurial networks as an outcome of entrepreneurial activity rather than considering entrepreneurial networking as the activity itself (Engel et al., 2017). As previously mentioned, academic research has been primarily devoted to the

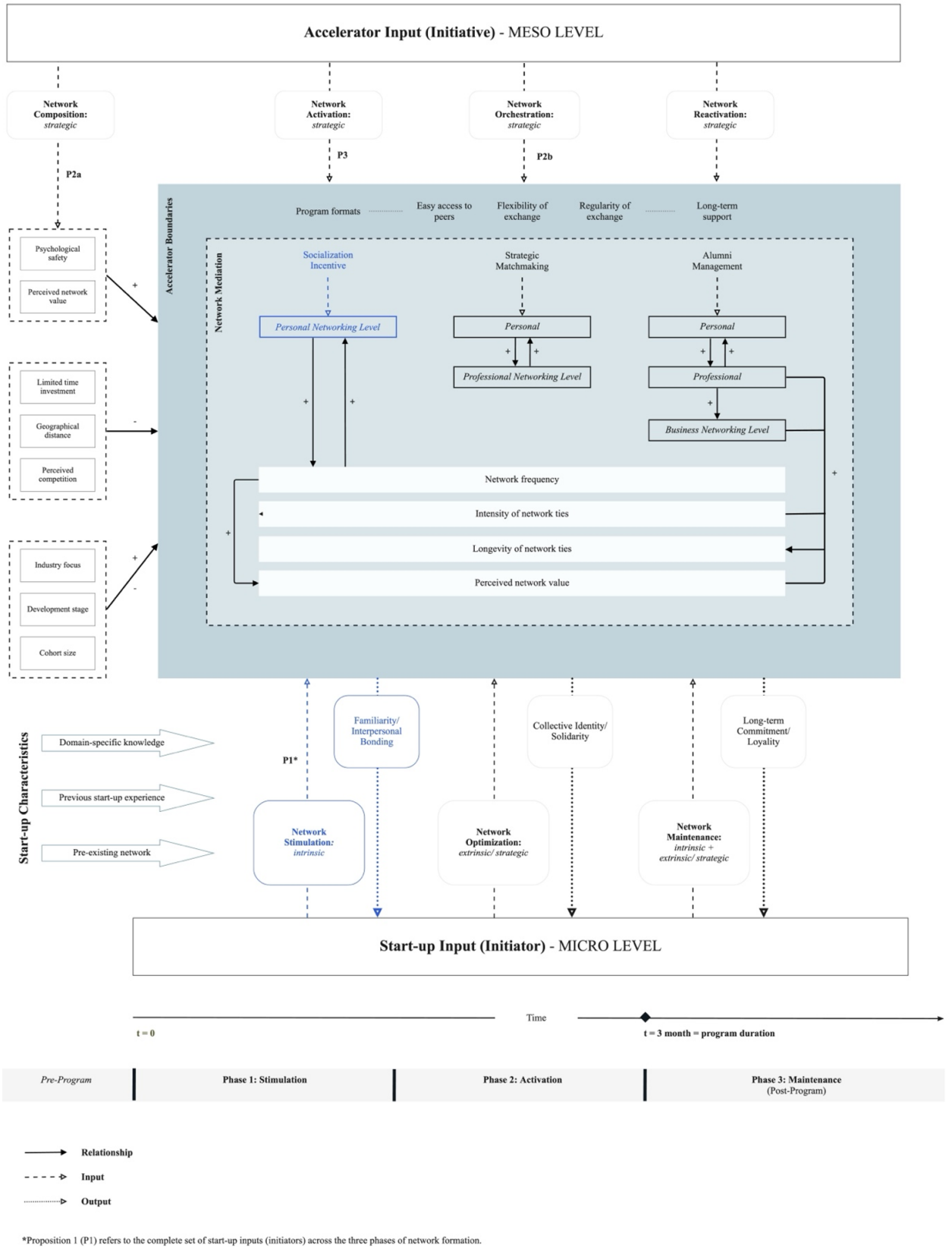

Figure 4: Process model - Dynamic input/output model of inter-organizational network formation (Source: Own illustration)

what, that is, the structural characteristics of entrepreneurial networks, while relatively little comprehensive knowledge exists of the *why*, that is, procedural elements and behaviors underlying entrepreneurial network activity (Evald et al., 2006).

Especially in the entrepreneurial context, however, it seems important to not only understand how nascent companies gain initial access to established networks but also how they proactively build effective networks from scratch. Therefore, in contrast to previous research, this study refrains from viewing network structures as exogenously given but rather characterizes entrepreneurs as active actors within a social network proactively seeking connectivity with their peers. Consequently, the active role of the entrepreneur in connecting with other founders takes a central role in my study. From the perspective of the active entrepreneur, the proposed theoretical framework should, therefore, be able to answer key questions about strategic goals, required resources, and potential uncertainties, but also provide insights on how to leverage and further develop the network. The model not only provides a basic representation of the various input and output factors guiding the different social interaction mechanisms but also extends our theoretical understanding of potential variability within founders' interaction mechanisms as well as along the stages of network formation.

Second, the findings illuminate and explore the flexible forms of inter-firm relationships that emerge in response to changing requirements at different stages of the development process. Moving away from a structural view and adopting a procedural perspective was necessary not only to understand the inherent reasons and motives of emerging founders for forming networks with their peers but also to gain a more comprehensive picture of the associated dynamic change processes over time. While most theoretical concepts examine networks at a single, fixed point in time (Evald et al., 2006), the underlying study provides new theoretical insights into the dynamic nature of the entrepreneurial network process. The results show that relationships between start-ups evolve organically and change over time in response to the agile nature of entrepreneurial processes and the underlying transformational needs of founders.

In particular, the results contribute to previous theories on entrepreneurial networking by providing a conceptual framework for the different types of relationships between founders in the initial phase of their development, as well as an explanation for the associated change processes in the related structures. In this regard, the study's results reveal the different stages of relationship formation from the first encounter to the end of the program. In addition, they show how the different types of interactions arise throughout the process as well as the associated relationship levels along which founders typically navigate during the course of the program. Based on the study results, the process model not only provides information on the chronological sequence of the networking phases and the different characteristics but also depicts the corresponding content, motives, and outcomes underlying the respective relationships between the actors. Essentially, the results suggest two main building blocks of inter-organizational relationship building: Personal relationships (personal network level) and company-specific relationships (professional and business level). Overall, these findings expand our holistic understanding of the different types of social interaction mechanisms and networking processes within the accelerator environment.

Third, the findings underscore the practical and theoretical importance of the accelerator's role in strategically supporting relationship building among founding teams to ensure optimized exchange and collaboration. The approach of describing the accelerator as a closed social network allowed the phenomenon to be studied in terms of underlying dynamics rather than specific structural components and design elements. Certainly, one of the greatest difficulties in forming social networks is the ability of nascent entrepreneurs to identify and enter into appropriately relevant relationships for the optimized development of their business. Compared to the ubiquitous role of accelerators in connecting young founders with relevant contacts in the regional ecosystem, the role of the accelerator also includes its inherent ability to catalyze internal network connections between teams of founders. While recent research on accelerators has provided evidence of the potential added value of collaborative peer environments (Cohen, Fehder, et al., 2019), no clear evidence exists on whether these benefits were achieved through proactive collaborative efforts by founders or strategic management of reciprocal exchanges and interactions on the part of the accelerator. Hence, this study sought to resolve this particular ambiguity by examining the evolution of the founders' relationships over time. Exploring the dynamics of peer interaction within social events allowed me to determine the respective conditions under which the accelerator's role became evident.

Findings show, how accelerators can serve as platforms for the emergence of start-up networks while also taking an active role in the strategic formation and development of relationships among founding teams. Drawing on this insight, the process model illustrates this duality of interaction dynamics by mapping the role of the founder as the initiator (pursuing a specific goal, interest, or need) and the role of the accelerator as a reactive initiative (responding to the founder's goal, interest, or need). In other words, it becomes clear that the willingness and incentive for mutual interaction must exist on the part of the founding teams and cannot be imposed by the accelerator. In contrast, however, it is the responsibility of the accelerator to identify or anticipate the specific needs of the founder to provide appropriate support initiatives or encourage mutual exchange.

Finally, this theoretical account is closely related to academic research on entrepreneurs' motives, incentives, and behavioral strategies in building social networks. Previous theories of entrepreneurship and network research differ, among other things, in their interpretation of entrepreneurial action. While some studies explain network configuration in terms of rational agency (Miller, 2007), others view rela-

tionship formation in the context of entrepreneurial uncertainty (Alvarez & Barney, 2007; Engel et al., 2017). Rather than committing to one of these views, this study combines both rationality and uncertainty in entrepreneurial behavior. Looking at the results and the derived process model, this approach becomes clear: Peer networks are formed partly out of strategic motives, but cannot be implemented completely rationally due to the uncertainty inherent in the entrepreneurial process (Engel et al., 2017). Again, this highlights the role of the accelerator as an insider helping to bridge or mitigate entrepreneurial uncertainty through strategic matchmaking between founders. This is not only a novel but an important theoretical insight within accelerator research as well as a theoretical answer to the question of how to deal with entrepreneurial uncertainty in the context of social networking.

Taken together, on the one hand, the underlying study findings and the resulting process model highlight the importance of examining motivational aspects of relationship formation on the part of the entrepreneurial actors to appropriately design the content of accelerator programs and strategically manage relationships between founders. On the other hand, the different forms of social interaction mechanisms over time inform our holistic understanding of the dynamic processes within founder networks and encourage additional research on entrepreneurs' social interaction mechanisms.

5.2. Practical implications

The theoretically developed framework offers valuable practical insights into the dynamic nature and unique characteristics of start-up relationship building. It provides suggestions for structuring and managing accelerators for effectively orchestrating and shaping start-up networks in the future. The findings of this study highlight the importance of social networks among early-stage founders and conceptualize networking as an integral and ongoing entrepreneurial activity throughout the entrepreneurial journey. Building networks with other founders should therefore be considered an inherently adaptive process in order to respond to shifting demands related to the dynamics of entrepreneurial processes, especially with regard to the maturity of the start-up.

In this respect, accelerators should be aware of their critical role as strategic catalysts for the formation of networks between start-ups and the various channels and tools they can use to foster and actively manage collaboration. The overall results show how network configuration becomes more specific as start-ups mature, likely due to the increasingly unique and specialized needs of founders. Therefore, ensuring an ongoing network strategy and design is critical for a successful entrepreneurial career. From a meso-perspective, which means, from the accelerator's point of view, this requires management to redesign or adapt the program to optimize internal connectivity and collaboration among start-ups. It is reasonable to assume that current efforts to promote entrepreneurial progress may not be realizing their full potential in this regard. Therefore, accelerators are well-advised not only to consider the composition of a cohort but also to implement measures and promote activities that support cohesion and the development of social capital among teams. In this regard, program structures and event formats should be designed in a way that allows teams to socialize beyond the regular content sessions. In doing so, the accelerator should integrate the idea of peer-to-peer networking as a core value in the program to promote the longevity of relationships and collaboration between start-ups beyond the program boundaries.

For founders, this study presents start-up networks not only in terms of their role in providing personal and emotional support but also as an important strategy for efficient development. Early-stage start-ups in particular should recognize the value of collaborative networks with other founders to motivate each other, provide professional advice, and gain access to external networks. In this regard, the results underscore the essential role of founders to willingly and actively seek out contact with peers - either directly by reaching out to appropriate parties or indirectly by openly articulating their needs. In practice, this implies that entrepreneurs should engage in ongoing initiatives that facilitate contact with founders and foster long-term connections. In addition, they should maintain a positive attitude toward sharing knowledge and experiences with other founders and adopt an overall cooperative mentality toward the network. However, the role of the committed and motivated founder makes the accelerator a vulnerable and sensitive model as soon as initiative and proactivity on the part of the entrepreneurs are missing. With this knowledge, accelerators are encouraged to integrate collaborative initiatives and continuously incentivize founders to proactively network with their direct environment.

Finally, creating the necessary framework conditions for start-ups is a fundamental part of funding policy. The results provide practical guidelines for policymakers, who are encouraged to evaluate accelerators not only based on their structural elements, but also on their ability to create efficient and long-term founder networks. Specifically, this means that criteria for assessing the efficiency of accelerators should be based on their ability to select relevant participants, develop efficient internal relationships, and coordinate them strategically to build an adequate network of founders. Such evaluation standards accordingly inform both entrepreneurs and the broader entrepreneurial landscape.

5.3. Limitations and future research

Although the underlying findings not only add to the basic understanding of what entrepreneurship is and how it emerges, my study reveals some limitations to consider. Moreover, the fragmented nature and novelty within the topic of founder networks provide insights for further research.

The primary question to be answered in the context of qualitative inductive studies is the extent to which the underlying findings allow for generalizability. According to Gioia et al. (2013), when dealing with a single case study, the issue

is less about generalizability and more about the transferability of the underlying phenomenon, that is, the applicability of the results to other contexts. Based on this assumption, generalizability is not to be understood in the sense of statistical representativeness but rather in the sense of theoretical plausibility. Hence, based on the underlying case study, the question arises to what extent the results are related to larger social contexts so that descriptions and explanations of the smaller social unit can be transferred similarly to a broader domain (Brüsemeister, 2008). Since the chosen accelerator setting represents a unique context, the corresponding results cannot be easily transferred outside this specific setting. Start-ups operating in an accelerator environment are part of a closed and protected world explicitly created to bring them together. Building relationships outside such an artificially created system might be subject to fundamentally different conditions and may require a whole new perspective. Therefore, it seems reasonable to compare the theoretical insights gained on network formation and its significance for founders in the context of the particular ecosystem in which they operate. This should also involve a closer examination of the role of the accelerator in relationship building with that of another type of support institution in order to uncover possible similarities or differences. Although studying the phenomenon allowed to build sufficiently robust theoretical propositions, suggesting transferability to other context (Gioia et al., 2013), social realities are often too complex to be investigated by a single research method (Edmondson & McManus, 2007). Therefore, validating the results against quantitative methods is strongly recommended to assess the quality of my findings and statistically test the proposed associations beyond the scope of this study.

If, however, we considers the accelerator not as an isolated unit but as a self-contained social structure within an overall system, it can be assumed that the internal relationships between the founders and the emerging founder network similarly reflect a part of the overall network. In other words, it is reasonable that the results relating to the formation of relationships between start-ups within an accelerator are nonetheless a result of the overall start-up ecosystem. This assumption suggests that relationships between early-stage start-ups might similarly develop beyond the boundaries of an accelerator. Thus, if networks between start-ups make a critical difference in the formation of a company, it seems essential to understand whether the added value is determined by specific characteristics of the network composition and thus independent of the setting or by the particular environment in which the network is formed. Therefore, future research will need do assess the model's applicability in other settings, particularly outside the accelerator landscape (e.g., across other emerging companies not supported by an accelerator) and beyond early-stage start-ups (e.g., across founding teams of different maturity).

Contextual considerations are closely related to another limitation often encountered in qualitative studies. Generally, researchers often assume that the insights gained from qualitative studies account for the nature of the underlying phenomenon as well. It should be noted, however, that entrepreneurship as a whole produces a wide range of different phenomena that may vary depending on context and individual circumstances (Gartner & Birley, 2002). First of all, entrepreneurship is considered a very heterogeneous phenomenon, which is why actors frequently deal with the same circumstances in different ways (Welter et al., 2017). Thus, we cannot simply assume that entrepreneurs go through the different phases of network formation in the same way (Greve & Salaff, 2003). This is consistent with the fact that the lifecycle of start-ups sometimes exhibit fundamental differences across domains and industries. For example, network requirements certainly differ between nonprofit social enterprises and high-growth start-ups in the technology sector. The phenomenon studied in this research includes processes and characteristics that are common to technology-based start-ups but cannot be simply applied to start-ups in other industries. In order to be able to make accurate statements about the general validity of the underlying results, further research is needed to validate the theoretical results across industries. Beyond that, however, it may be interesting to conduct more in-depth studies within a single industry. If we assume that network relationships offer corresponding advantages in entrepreneurial contexts, the question arises whether all actors in a network find equal conditions and can draw the same output from the network respectively, or whether it is specific characteristics of the individual actor that lead to network-based advantages. Future studies might, therefore, discuss the presented theoretical framework in the context of different institutional, economic and cultural settings to make potential relationships between context, network, and individual network actors more tangible.

Taken together, due to the limited duration founders spend in an accelerator as well as its artificially created environment, it would be naïve to conclude from the particular, that is, the specific case, to the general, that is, the environment of the case and thus to sociocultural rules (Bürsemann, 2008). Certainly, however, accelerators provide an essential cornerstone for initiating exchange and establishing social bonds among founders in the early stages that might equally be leveraged in other contexts. Therefore, the extent that the underlying findings represent the boundaries of best practices for a single accelerator, they should serve to provide both guidance and lessons that can be adopted more broadly. As such, the model developed not only represents a theoretical construct with demonstrable transferability for the subject area studied, but also serves as a foundation for scholars, practitioners, and entrepreneurial stakeholders alike.

6. Conclusion

Developing, promoting, and managing networks is a core element of entrepreneurship. Building efficient relationships and a solid network becomes a key success factor in today's competitive global market. Yet, the potential of collaborative

networks between emerging companies is often underestimated. In this study, I employed a qualitative, inductive approach allowing me to examine processes and mechanisms at multiple levels over time. Specifically, I developed a dynamic process model based on inter-organizational relationships of early-stage start-ups operating in an accelerator environment. Within the socially situated framework of the accelerator, I was able to examine the process elements and interaction dynamics involved in the formation of different types of relationships between nascent founders. The process model developed focuses on the key characteristics and conditions related to inter-firm relationship building. It captures how founders adaptively shape their relationships with peers in light of changing personal and organizational needs while illustrating the intermediary role of the accelerator in strategically connecting founders to foster an effective network and create a cohesive environment. Findings suggests that relationship formation among start-ups is a likely replicable type of process, the underlying dynamic nature of which may be relevant to both nascent founders as well as entrepreneurial support institutions. Novel insights should accordingly be used to guide the design and strategic management of start-up relationships. In order to achieve associated goals, accelerators are required to revise their business model incorporating collaborative initiatives and ongoing network support. Overall, I hope that the underlying findings and theoretical propositions will further stimulate research on the dynamic and interactive nature of inter-organizational networks and encourage dialogue across relevant domains.

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