Choreographies of entrepreneurship: How different formats of co-presence are combined to facilitate knowledge creation in seed accelerator programs

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Choreographien von Unternehmensgründungen. Wie verschiedene Formate physischer Kopräsenz in Seed-Accelerator-Programmen für die Produktion unternehmerischen Wissens kombiniert werden

Abstract: This paper explores different functions of co-presence for collaborative knowledge creation in the context of seed accelerator programs. Seed accelerators offer programs of three to six months to enhance the growth of early-stage start-ups through various means of training and organizational development. In this paper, seed accelerator programs are analysed as orchestrated sequences of different types of physical co-presence. By drawing on qualitative case study data, the paper identifies eight different ways in which physical co-presence is used during seed accelerator programs. Through these eight types of co-presence, the analysis reveals that physical co-presence unfolds unique social dynamics that are utilized in a carefully designed combination of presence and absence. It is shown that physical co-presence is a means to enact relational distance and to bridge this distance for the benefit of the entrepreneurial process. Therefore, this paper adds a new perspective on how co-presence is used to facilitate the generation of value through collaborative knowledge creation.

Keywords: Temporary co-presence, relational distance, entrepreneurship, accelerator

Kurzfassung: Dieser Beitrag erkundet verschiedene Funktionen von Kopräsenz für das Gelingen von kollaborativer Wissensproduktion im Kontext von Seed-Accelerator-Programmen. Seed Accelerators bieten drei bis sechsmonatige Programme an, in denen das Wachstum von neu gegründeten Start-ups durch verschiedene Maßnahmen zur Firmenentwicklung beschleunigt werden soll. In diesem Beitrag werden Seed-Accelerator-Programme als orchestrierte Sequenzen aus verschiedenartiger physischer, gleichzeitiger Anwesenheit (Ko-Präsenz) analysiert. Aus einem qualitativen Fallstudiendesign heraus werden acht Formen von Ko-Präsenz identifiziert, auf denen die

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analysierten Programme beruhen. Weitergehend wird herausgearbeitet, wie diese acht Typen von Ko-Präsenz auf sozialen Dynamiken beruhen, die durch den *Seed Accelerator* mittels einer abgestimmten Kombination aus Ko-Präsenzen und Abwesenheiten erzeugt werden. Dadurch kann relationale Distanz überbrückt werden, um Wissen zu produzieren, das den Prozess der Unternehmensgründung erleichtert und beschleunigt. Konzeptionell wird eine neue Perspektive geboten, wie Ko-Präsenz genutzt werden kann, um kollaborative Wissensproduktion in Wert zu setzen.

Schlüsselwörter: Temporäre Ko-Präsenz, relationale Distanz, Entrepreneurship, Akzelerator

1 Introduction

The concept of co-presence is a cornerstone of how economic geographers conceptualize the geographies of knowledge creation, innovation and creativity. From an interactive notion of learning and innovation, the core assumption has been that face-to-face interaction between participants is indispensable for any collective effort of knowledge creation (Storper/Venables 2004; Rutten 2017). Economic geography embraced the topic of interactive knowledge creation enthusiastically not least because it provides yet another set of theoretical ideas to explain the spatial concentration of economic action (Malmberg/Maskell 2002).

However, against the background of an increasingly globalized economy, attention has shifted from knowledge-based spatial clusters to practices of knowledge sharing that operate across physical distance (Bathelt/Henn 2014; Maskell 2014). The buzz-and-pipeline debate highlights the fact that the most innovative firms rely as much on "local buzz" as they employ global partnerships outside their home region in "global pipelines". Buzz and pipelines are functional complements with different social qualities. While buzz is associated with informality, serendipity and high degrees of mutual trust, global pipelines have been found to be more formalized, more effortful and dependent on (digital) media technologies (Bathelt/Malmberg/ Maskell 2004). Yet, even the establishment of global pipelines relies on physical co-presence. For instance, such pipelines are formed in personal meetings at "temporary clusters" (Maskell/Bathelt/Malmberg 2006) such as trade fairs or conventions and on more mundane occasions of organized proximity, like intra-or inter-organizational business meetings or on-site visits (Power/Jansson 2008; Bathelt/Henn 2014; Henn/ Bathelt 2015). The microanalytic perspective inherent to studies on temporary co-presence provides insights on how buzz can be scale-dependent as settings influence interactions (Growe 2018).

With this qualitative empirical study on temporary co-presence in seed accelerator programs, undertaken in Amsterdam, Berlin, Hamburg and Detroit, we aim to add to the expanding literature on the multiple functions of co-presence in collaborative knowledge creation. In this literature, it is widely acknowledged that different forms of co-presence exist to promote knowledge sharing within clusters and across distance. Moreover, different forms of physical co-presence have been analysed in terms of their association with different types of relational proximity. Henn and Bathelt (2015), for example, developed a typology in which they relate different types of physical co-presence with different principal proximity dimensions. In their analysis, for instance, trade fairs and conferences are based on cognitive proximity while intra-firm business meetings rely on organizational proximity. In our study, we seek to contribute to this strand of literature in the following ways.

First, so far situations of co-presence have been understood as situations in which geographical or physical co-presence coincides with relational proximity along one or even more dimensions. A conference, in this understanding, is characterized by the concurrence of physical co-presence *and* the like-mindedness of the participants (Henn/Bathelt 2015). While this description is accurate, it underestimates the fact that knowledge creation not only requires a shared understanding but also some type of friction based on dissimilarity (Page 2008). Therefore, in this paper, we use the term "relational distance" (Ibert/Müller 2015) as a heuristic to analytically focus the tensions and frictions that are enacted in situations of co-presence and the opportunities for learning that are related to them. We seek to advance a strand of recent literature that explores the productive aspects of distance for knowledge creation (Amin/ Cohendet 2004; Ibert 2010; Grabher/Ibert 2014; Stein 2014).

Second, with seed accelerator programs our study focuses on a new organizational form of knowledge co-creation. However, as we will show, it would be inadequate to understand seed accelerator programs

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as just another *type* of co-presence. Rather, these organizations are complex conglomerates consisting of different, interdependent formats of co-presence. The new empirical phenomenon thus invites us to decompose complex settings of co-presence, to unpack the different components and appreciate their different logics. A conference, for instance, not only comprises scientific presentations followed by discussions. It also encompasses further settings such as keynote lectures, executive dinners, informal one-on-one discussions, joint site-seeing and so forth.

Third, we argue that the affordances of co-presence cannot be grasped by observing only the situation itself. While previous studies on physical co-presence mostly focus on specific situations of co-presence, such a strategy might overlook important aspects. To explore the temporal interdependencies of different formats of co-presence, we pursue a procedural analysis of knowledge practices. Seed accelerator programs last for three months and are packed with different occasions of co-presence, interjected with breaks for retreat so that a carefully designed choreography of co-presence and absence emerges. A dynamic, procedural approach highlights the effects of the combination and order of formats of co-presence that cannot be registered by focusing on the situation alone. While a procedural view is already established in the entrepreneurship literature (Ihrig/Zu Knyphausen-Aufseß/O'Gorman 2006; Steyaert 2007), it is still in its infancy in economic geography (Ibert/Hautala/Jauhiainen 2015).

In the next section, we situate our approach in the relevant literature on co-presence, proximities and the interaction of physical and relational distances. In Section 3 we develop an analytical framework and depict our research design. In Section 4 we identify different types of co-presence and analyse them in terms of how they enact and make use of relational distance. Section 5 focuses on the temporal interplay of the different forms of co-presence before Section 6 gives some conclusions.

2 Physical co-presence and relational distance

2.1 Co-presence: initiating open and contingent social dynamics

What are the social effects of physical co-presence? Goffman (1963: 17) defines co-presence as follows:

"Persons must sense that they are close enough to be perceived in whatever they are doing, including their experiencing of others, and close enough to be perceived in this sensing of being perceived". This quote illustrates that physical co-presence itself has no social consequences. Yet it provides a physical setting in space that allows the conscious awareness of the presence of others. Physical co-presence has social effects when the awareness is reciprocated by others (Grabher/Melchior/Schiemer et al. 2018). Co-presence creates social constellations, which Goffman specified as "gatherings" and "situations". The term gathering thereby refers to "any set of two or more individuals whose members include all and only those who are at the moment in one another's immediate presence" (Goffman 1963: 18), while a situation denotes "the full spatial environment anywhere within which an entering person becomes a member of the gathering that is (or does then become) present. Situations begin when mutual monitoring occurs, and lapse, when the second-last person has left" (Goffman 1963: 18). This implies that physical co-presence does not automatically create inter-personal dynamics, yet at the same time makes it difficult for participants to ignore each other. This notion of co-presence explicitly does not conflate physical closeness with inter-personal sympathy or similarity. Rather, without intimately knowing each other or directly communicating, physical co-presence still associates the involved participants with the same gathering and creates a social situation. Hence, people might work side by side and still hardly take notice of each other. On other occasions in which people are aware of the respective counterpart's presence, people might feel familiar despite being spatially separated (Grabher/Melchior/Schiemer et al. 2018). The former situation, however, denotes a social situation of co-presence while the latter circumscribes a social relation across physical distance.

Furthermore, physical co-presence is highly charged with emotion. On the one hand, co-presence offers unique opportunities to immediately share impressions and experiences (Storper/Venables 2004). It represents the most important if not the only way to come into close contact with other humans. Thus, it is charged with expectations of conviviality, sociability and even desire (Boden/Molotch 1994). On the other hand, however, situations of co-presence expose the involved individuals to their counterparts, often to a larger degree than desired. The enhanced visibility in mutual monitoring might evoke feelings of vulnerability and fears of being uncovered (Goffman 1963). Simmel

(1903) concludes that physical co-presence is seldom a neutral experience. Rather, these situations are typically unequivocally experienced either as comfortable and rewarding or as unpleasant and threatening.

2.2 Bridging relational distance: productive differences

In this paper, we use the notion "relational distance" (Ibert 2010; Ibert/Müller 2015) as a heuristic tool to assess the cultural differences that play out in social situations. Relational distance is a notion that allows an analysis of the intensity and quality of cultural diversity in social ties.

Proximity and distance are continuous variables (Hoegl/Proserpio 2004) that mark the poles of a continuum. This polarity allows assessment of the intensity of cultural strangeness that exists in a social relation or constellation. Proximity thereby denotes a high degree of similarity, while distance is associated with dissimilarity (Wilson/Boyer O'Leary/Metiu 2008). Proximity and distance can occur along several dimensions. Therefore, we adopt the idea that social relations are "multiplex" (Uzzi 1996: 681). In a relation, different roles, normative beliefs and affiliations co-exist. For instance, two persons can belong to the same organization and represent different professions. Both the similarity in organizational affiliation as well as the difference in terms of professional training can be mobilized and made consequential in interaction. The kind of differences – and commonalities – on which interactions between network partners are based is thus an open empirical question.

These general ideas partly link up with the proximity discourse in regional economics and economic geography (Boschma 2005; Knoben/Oerlemans 2006). This discourse provides an idea about the magnitude of possible dimensions of multiplexity by differentiating between organizational proximity (membership in organizational units and sub-units), institutional proximity (similarity or dissimilarity in systems of formal and informal rules to which actors adhere), cognitive proximity (dis-/similarity of concepts and mental models used by actors), social proximity (personal ties) and geographic proximity (distance in physical space). For the purpose of this paper, we refer to those dimensions that are relatively uncontested in research on the topic (Table 1). In addition, we include functional distance (mutual accessibility in terms of being able to get into contact), interest distance (shared interest in a topic or

Table 1: Dimensions of relational distance.

Dimensions of relational distance	Empirical operationalization of assessing closeness
Cognitive	(Dis-)similarity with respect to disciplinary enculturation or involvement in different knowledge practices
Organizational	Belonging to same/different organizational structures or units, acting within/across organizational boundaries
Institutional	Shared rules, norms, conventions
Social	Strengths of ties: degree of personalized trust, richness and duration of joint experiences
Functional	Mutual accessibility, being able to get in contact, temporal effort to create face-to-face encounters
Interest	The shared fascination for a topic and common commercial goals
Authority	Power asymmetries and access to resources

Source: modified from Ibert/Müller (2015: 184)

common goals) and authority distance (level of power, access to resources, reputation). Table 1 summarizes the dimensions we address in the next sections and how we operationalized them for an empirical investigation. We did not single out geographical proximity, as the aim of our study is to scrutinize in detail how the complex choreography of co-presence and absence enables participants to make productive use of relational distance.

The proximity debate has thus far not fully embraced the idea of multiplexity. Rather the identified dimension of proximity and/or distance are often discussed separately (Boschma 2005; Mattes 2012) by applying curvilinear approaches to identify the sweet spot most conducive for innovation somewhere between the poles. For instance, in the cognitive dimension the learning function has an inverted u-shape: when actors are too proximate, they cannot inspire each other, when they are too distant, they do not understand each other anymore. Hence, the optimal constellation for mutual learning is in the "golden middle" (Nooteboom 2000). In this paper, in contrast, we analyse the co-existence and interaction of different dimensions of proximity/distance in different social situations of physical co-presence.

Apart from initiating social gatherings and situations that are emotionally charged with ambivalent feelings, the

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social nature of physical co-presence remains obscure. For the field we are interested in here, Boschma (2005: 61), for instance, concludes that geographical proximity remains indeterminate as it is neither a sufficient nor a necessary condition for knowledge production. In an empirical study of innovation biographies, Ibert and Müller (2015) identified ten typical dyadic relationships of learning during innovation processes. All of them can be described in terms of what kind of relational distances and proximities they constitute. However, for none of them was physical proximity constitutive, even though all of them unfolded particular geographies of presences and absences.

While most contributors have been interested in exploring how relational proximity can substitute for or is complementary to physical proximity, in this paper we scrutinize the unique affordances of physical co-presence to bridge relational distance. By bringing together people from different backgrounds in the same time-spatial "situation" (in the sense of Goffman), we argue, physical co-presence might trigger a lot of open-ended and highly contingent social dynamics (Bathelt/Gibson 2015). Thus, the bridging of relational distance can contribute to the overall development of early start-up ventures. With bridging, we refer to two related sets of practices that harness the unique affordances of co-presence.

First, physical co-presence can be theorized as an enabler of encounters between people who would not otherwise have met in person. Different social groups often also segregate in physical space, which results in disentangled everyday activity spaces and makes personal encounters unlikely events. Physical co-presence, however, is the contrary of spatial segregation. Connecting with people and making new ties becomes more likely. Against this background, seed accelerators provide unique opportunities for people to rewire (Panitz/Glückler 2017) their networks, either through active brokering (Obstfeld 2018) or through serendipitous encounters.

Second, co-presence provides preconditions for mutual engagement of otherwise separate practices. To be able to learn about hitherto unknown practices and to fully appreciate the underlying rules and assumptions it is necessary to delve into the tacit dimension (Polanyi 1967) of the respective knowledge. This is time-consuming and effortful and can thus be more easily achieved through direct and personal interaction and observation, for example, when participants can look over each other's shoulders (Storper/Venables 2004).

3 Research design

This contribution is based on a qualitative multiple case design (Yin 2014) investigating the operational procedures of seed accelerators. As practices in the field vary and not all accelerators use the same formats in the same way (Pauwels/Clarysse/Wright et al. 2016; Hausberg/ Korreck 2018), the analysed cases and collected data cover a wide range of different formats of co-presence within accelerators, but also offer rich layers of data and thick descriptions to afford a coherent understanding of interrelations between individual formats.

3.1 An analytical framework for co-presence in seed accelerators

Seed accelerators can briefly be defined as permanent organizations that host temporary programs with the aim of supporting a selected cohort of start-up enterprises (Drori/Wright 2018: 2). The accelerator organization itself is a permanent organization consisting of a small team including a managing director and some operational staff such as event managers and entrepreneurs-in-residence. Besides this permanent staff, all other actors engage on a temporary basis. For start-ups, access to the programs is based on an open yet highly competitive application process. For each cohort, start-ups from different regions and backgrounds are selected. Each of the participating start-ups consists of two to five individuals, including the founders and in some cases early employees. The team members have different roles reflecting their expertise, such as chief executive officer (CEO) for management and chief technology officer (CTO) for software development.

The program is held at a fixed place, where office space is provided for the participating start-ups, which relocate temporarily. During the program, the participants also receive active support in the form of training, mentoring, networking and guidance both from the staff members and external mentors and coaches (Drori/Wright 2018). The seed accelerator organization activates those contacts from their network of potential mentors that match best to the needs of the participating firms. Goswami, Mitchell and Bhagavatula (2018) thus identified seed accelerators as key intermediaries in entrepreneurial ecosystems, which broker new contacts between otherwise separate groups. Usually, seed accelerators are funded by institutional backers, which can include one ("corporate accelerator") or more corporate investors. These act as strategic partners, also

reflecting their own open innovation interests (Hausberg/ Korreck 2018). Further, seed accelerators are operated by venture capital firms, universities or (less commonly) by regional development agencies. Most accelerators are single-site operations with an industrial or thematic focus, related to their strategic partners. Yet some independent accelerator organizations (e.g. Techstars or Startupbootcamp) operate programs with corporate partners from different industries in different cities. Irrespective of the thematic scope and strategic interests, most seed accelerators place capital investments in the start-up firms they select for participation in the programs (Yang/Kher/Lyons 2018). Due to this investment, both parties share a vital interest in boosting the start-up's growth.

A seed accelerator program of typically three to six months engages participants in manifold activities (Hochberg 2016). During this time, various formats of physical co-presence are applied. While these formats differ in many details, they all curate participants purposefully in pre-arranged settings. Building on previous attempts to classify instances of knowledge creation under co-presence (Bathelt/Henn 2014), we seek not only to identify different formats of co-presence during accelerator programs but also to explore the complex constellations of overlapping dimensions of relational distance enacted through them and further to assess the direct or indirect effects of the situational dynamics on knowledge creation and learning. Our analysis thus proceeds in three steps:

Step 1 – Formal description: different formats of co-presence vary in terms of key formal features. These features encompass the duration of co-presence (from a few minutes to a full day), the scope and constellation of actors (from "one-to-one" to "many-to-many"), frequency and repetitiveness of co-presence, modes of interaction and the material affordances and atmospheric qualities of the chosen spatial setting (Growe 2018).

Step 2 – Analysis of relational distances: seed accelerator programs bring together a diverse set of actors (Dempwolf/Auer/D'Ippolito 2014). These actors represent different cognitive backgrounds (software developers, entrepreneurs, finance), professional seniority or authority (mentors and serial founders vs. university spin-off founders), organizational affiliations (program organizer, partner enterprise, company founder, freelancers) and institutional embeddedness (e.g. public authorities, private enterprises, science and education). Moreover, we seek to disentangle the respective combinations of dimensions of relational distance (see Table 1) that exist between participants in any given constellation of co-presence.

Step 3 – Assessing the effects of relational distance: knowledge creation is elemental for start-ups (Ihrig/Zu Knyphausen-Aufseß/O'Gorman 2006) as entrepreneurship has been described as a "process of learning" (Minniti/Bygrave 2001: 7) itself, with both general entrepreneurial knowledge and specific industry or market-related knowledge being most crucial (Minniti/ Bygrave 2001: 13). Entrepreneurial learning, however, is rather non-linear and "critical learning periods" dominate over less disruptive times (Cope 2005: 374). Albeit encompassing a relatively short period, the creation of practised knowledge during seed accelerator programs implies a key episode within the entrepreneurial process (Bliemel/Flores/de Klerk et al. 2019). Therefore, we seek to explicate the resources that can be mobilized in each format and the possible direct or indirect effects on the entrepreneurial process. To implement this analytical framework, we gathered qualitative data on several cases, where each case represents a different seed accelerator program. Case selection and data collection are described in the next section.

3.2 Case selection

In order to grasp the variety of forms and procedures but also to ensure a certain degree of robustness through replication of findings in several cases and across variation, we decided to factor out regional peculiarities by collecting exploratory data from ten cases across four regions – Amsterdam, Berlin, Detroit and Hamburg – representing three different national contexts. We soon realized that despite local idiosyncrasies and territorialized institutions, there are striking similarities in the practices of running such programs. Our interviewees showed the well-developed awareness of practitioners about the practices at other locations. Many seed accelerator organizations run branch offices in several locations.

On that basis, we decided to develop three of our ten cases into deep cases ("DC" 1-3). For these cases, we combined several layers of data in order to study them in a more comprehensive way. While the variety of studied programs suggests that not every seed accelerator includes all identified formats of co-presence, only those cases qualified as deep cases that promised to come rather close to an ideal-typical constellation. Demo days, for example, are a feature of virtually every accelerator,

while specific cases lack formats of close collaboration between start-ups and industry partners or do not require their participants to relocate and cowork together. The deep cases share the similarities of having multiple industry partners (e.g. not being corporate accelerators in a narrow sense) and being active in multiple cities. They also are comparable in that they offer a rather comprehensive set of formats of co-presence. The other seven cases were treated as context cases ("CC" 1-7) and the data already collected for them was thus also coded, but only used to replicate findings developed from deep cases under differing conditions, and to triangulate different cases and data sets.

It is important to note that industrial profiles and notably the levels of entrepreneurial activity differ widely between the regions. Amsterdam and Berlin are considered as national or even global centres for start-ups (Brown/Mason 2017), while Hamburg and Detroit act rather as centres for conventional industries. However, this paper is mostly concerned with the internal mechanisms of accelerator programs, and our results even imply that the mechanisms of co-presence work in a similar way despite structural differences in the respective regions.

3.3 Data collection and analysis

We included four types of qualitative data: semi-structured interviews with stakeholders, participatory observations at public or semi-public events, ethnographic interviews during participant observation and document analysis (Table 2). This combination of multiple qualitative approaches was undertaken for two reasons. First, data obtained through different strategies can be used for mutual "enrichment" (Dowling/Lloyd/Suchet-Pearson 2016). Second, data accessibility was constrained because during the seed accelerator program, actors were rarely available due to the high workload and later they had relocated back to their original workplaces. A combination of data collection strategies thus enhanced availability to a considerable extent.

We conducted 19 semi-structured expert interviews with individuals directly related to our cases and, to ensure sensitivity to the local particularities of entrepreneurial processes (Herbert 2010), eight interviews with regional experts, such as venture capital investors or regional development policymakers. The regional experts were typically indirectly involved with at least one of the cases in their region. For each case the interviewees were

the managing director and at least two participating entrepreneurs we had been referred to. The interviews in Amsterdam and Detroit were conducted in English, the interviews in Berlin and Hamburg in German. All interview material was audio recorded and transcribed verbatim with quotations being translated for this paper where necessary. Further, data was collected during participatory observations carried out at either semi-public events of seed accelerator programs, e.g. demo days, or more private events, for which access was granted by our interviewees. During or shortly after observations, field notes were taken with a specific focus on the structure and timing of the events, the individuals present, the location and how individuals interacted. The events visited included demo days (7), workshops (5), parties and further networking events (5).

At these occasions, it was also possible to conduct interviews with participating entrepreneurs, additional staff members, mentors and external partners spontaneously. These "ethnographic interviews" (Spradley 1979) were much shorter (between five and ten minutes) and could not be recorded. Nevertheless, they proved to be a rich source of data. Protocols of the ethnographic interviews were integrated into the field notes.

Finally, we screened documents from the field exploratively for all our cases. The sources include public material available online, including blog posts, e-mail newsletters, presentations, reports, podcasts and videos.

Data collection in Amsterdam, Detroit and Hamburg took place during field stays in 2016 and 2017. The data in Berlin was collected over a longer period in those years, making it possible to react more spontaneously to local opportunities for participatory observations. The sample of data thus differs from region to region. For Amsterdam and Detroit pre-arranged expert interviews dominated, while in Berlin participant observations were easier to arrange.

Before the analytical framework described in Section 3.1 could be applied, the vast and heterogeneous dataset resulting from these efforts needed to be processed as follows. First, the data was screened for instances of co-presence or other interactions between any of the stakeholders involved in an accelerator program. Second, a description of each of these instances of interaction was produced; drawing on as many data points as possible and avoiding repetitions. The description focuses on the constellation of stakeholders involved and the modalities of interactions between them, but also on more formal features such as timing and, of course, location. The result of this step was a

Table 2: Data and cases

Case	Location of data collection	Interviews	Observation	Ethnographic Interviews
DC_1	Berlin/Detroit	4	5	8
DC_2	Amsterdam/Berlin	4	3	3
DC_3	Hamburg/Berlin	3	2	4
CC_1	Berlin	1	1	2
CC_2	Amsterdam	3	0	0
CC_3	Berlin	1	1	0
CC_4	Berlin	0	4	2
CC_5	Detroit	1	0	0
CC_6	Berlin	1	1	0
CC_7	Berlin	1	0	0

list of 22 instances of co-presence, many of which were consistent throughout the cases. Third, these instances were systematized into eight types of interaction during seed accelerator programs. The types were established according to the criteria of consistency and coherence by developing only those examples into types that feature repeatedly across our data. We further ensured coherence by synthesizing empirical accounts on instances of co-presence with similar characteristics into an ideal-typical account representing a type of co-presence. Then in a fourth step, the types of co-presence were coded using the analytical framework described above. Fifth and finally, interdependencies of the eight instances were analysed, using a process perspective on entrepreneurial development during the accelerator program specifically focusing on the role of knowledge generated during the program. The results from step four are presented in the next section, the results of step five in the subsequent section.

4 Findings: Formats of co-presence – constellations of co-presence during seed accelerator programs

In this section, we analyse different formats of co-presence included in seed accelerator programs. We identified eight distinct formats, which will be analysed in the remainder of this section by applying the analytical framework (see Section 3.1).

4.1 Kick-off events

The formal start of an accelerator program is marked with a "kick-off event", usually on the first day, when the participating start-ups move into the shared office space. The kick-off is the first time that all the key actors (management team, start-up teams and important partners) come together. Kick-offs are thus many-to-many formats of interaction, which, however, can be interrupted by team events or onboarding sessions (few-to-few) that provide first opportunities to socialize among start-ups.

The kick-off event is characterized by social distance. Most of the participants do not know each other beforehand; many entrepreneurial teams even join from regions other than the accelerator's location. Moreover, the start-ups represent different organizations that have not collaborated before. Hence, the situation is dominated by organizational distance as well. However, as most start-ups are in a similar situation and most team members are used to being integrated in local "start-up communities" in their respective home regions (van Weele/Steinz/van Rijnsoever 2018) they are already rather close in terms of institutional and cognitive distance and share an interest in learning quickly about issues related to the entrepreneurial challenges.

The kick-off format supports the envisioned learning process in several, mostly indirect ways. First, it creates a sense of belonging. Kick-offs represent the first step to overcoming initial social distance among the participants and to constructing a shared "cohort" identity that will run through the program together. Furthermore, even though participants still belong to

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separate organizations, the kick-off-event reminds them that they now enter a new phase during which they work under similar conditions and time constraints. The kick-off, in other words, strengthens the participants' awareness of (temporary) organizational proximity (Drori/Wright 2018). Finally, by joining the program, the start-up firms have formally agreed to temporarily relocate from their original firm sites into the accelerator space. This relocation creates a shared space in which bonding can take place (Growe 2019) and functional distance is about to decrease.

Second, kick-off events evoke a sense of a fresh start in which participants are prepared to cross boundaries, to leave behind everyday restrictions and to commit to something extremely challenging and ambitious. With the demo-day as the concluding event only some months ahead, the end of what has just started is already close. All participants thus are aware right from the start that they are enrolled in an endeavour characterized by an "institutionalized ending" (Lundin/Söderholm 1995: 449). This framing of the coming three months as an extraordinary time span is underpinned by the spatial demarcation between the inside and outside of the seed accelerator, the latter representing the constraints of everyday business while the former promises new unforeseen opportunities.

The effects described above do not directly support learning processes. Yet, they provide a fertile ground for learning on subsequent occasions. While the first set of effects provides a general sense of belonging that underpins the disposition of participants to share knowledge freely in upcoming situations, the second set of effects spurs the participating start-up teams to work with extraordinary motivation and to welcome pivotal transitions.

4.2 Coworking

The participating start-ups and the operational staff occupy a shared office space, where they work side by side. The offices are in most cases aesthetically designed and located in prestigious areas. Quality office infrastructure and various perks are offered to ensure an atmosphere in which high workloads can be accomplished. Coworking is the most prevalent format of co-presence as it reoccurs daily throughout the whole seed accelerator program. The constellations and intensity of interaction vary and range from 1-to-0 to few-to-few.

During the coworking, some members of the operational staff are present and often assist the participants with the challenges of their daily work by providing complementary expertise. Acting as "entrepreneur in residence" or "developer in residence", these experts engage the participants actively and help to avoid complications to their progress. Therefore, the interest distance of the actors involved is rather low and decreases further during the time of the program. The relocation of start-ups into a shared office space reduces the functional distance between them. Mostly, participants described coworking as focused work on the individual assignments of the team members (e.g. 1-to-0 constellations of coding, legal and financial tasks). However, frequently, 1-to-0 can gradually transform into few-to-few interaction within teams or – less frequently – across teams.

> "This shared environment is where they learn from each other and see each other, and we are, the MD [managing directors] are here. And the 'entrepreneurs in residence', the EIR, these are cooperating people participating. Everybody is here, and then you learn so much more from each other" (Managing director DC_2).

Together, relational proximity – in terms of shared interests achieved through social curation – and functional proximity create a situation in which teams develop a local community of entrepreneurial practice (van Weele/Steinz/van Rijnsoever 2018) and at the same time strive towards different customer markets. Conflicts of interest between teams are typically avoided in the selection process, during which the selection committees usually seek to circumvent the integration of firms competing in the same market. Instead of being several teams, through sharing the same space participants

> "feel like one big team […] and we try to help each other […] without the other people it would not make the acceleration, […] because we needed the other people to kind of help or guide through different ideas" (Start-up CEO_1 DC_1).

What starts as occasional one-to-one conversations increasingly turns into many-to-many interaction embedded in the daily coworking routines, driven by serendipitous encounters between those present in the shared office space. The main objective of this element of the program is to enable the individual start-ups to proceed with the development of their product and organization while creating a pool of shared knowledge that also encompasses complementary assets distributed across all teams.

"How to deal with contracts for example. The difference between just using some example from the internet versus having a lawyer around to ask just helps a lot. Just to fit in as an entrepreneur, not to be alone and google stuff, but to know how the other teams are solving it" (Start-up CEO CC_3).

4.3 Coaching

Inputs from external coaches are part of most seed accelerator programs. Timing during the program and the scope of coaching workshops varied somewhat between our cases. However, these half-day or full-day workshops take place frequently and resemble one-to-many constellations in which the start-up teams receive expert knowledge provided by the coach. The sessions were mostly held in meeting rooms within the accelerator's offices.

"Then there was at least one event per week, mostly half a day, sometimes more or less, with a workshop on different topics. For example, somebody was invited to explain to us how to build a team, how to hire people and so on. Or how to do online marketing, all the topics regarding the formation of a company" (Start-up CEO CC_3).

In terms of relational distance, coaching enacts social dynamics that are close with regards to shared interests and cognitive mindsets and distanced in terms of authority. The coach usually is an acknowledged expert, often with experience in launching an enterprise and with an international background, while the start-up teams are in the role of learners. In the course of several coaching sessions, the cognitive divergence within the cohort of the firms diminishes, as the whole cohort is aligned to a similar level of expertise and streamlined onto similar managerial practices.

Despite the variation, the learning dynamics are always similar. The external coaches provide input on rather generic topics relevant to the whole batch of participating start-ups. Topics include entrepreneurial or management techniques such as the "business model canvas" or "term sheet" but also legal know-how, insights on specific technologies and pitch training to prepare the final demo day. The coaching events represent an additional service for the participants, who can learn relevant practices without much further effort.

4.4 Socializing

Throughout the seed accelerator program, socializing events are arranged on a regular basis either after office hours or during breaks, with participants from all start-up teams joining in. The duration of the events varies between half an hour and a few hours and the constellation of actors ranges from few-to-few to many-to-many. These events have an informal character and are mostly organized in nearby venues like bars or restaurants.

"And then there are some social events like the 'Drinks on Fridays' or 'Pizza on Tuesday'. Yeah, this sort of builds a community feeling" (Operational staff CC_2).

Due to the importance of having frequent socializing events, seed accelerators need to be located at sites offering a range of diverse amenities nearby:

"Since there are so many different nationalities here, you need to be in an international place. Because people [...] If your food is strictly vegan for your religion and we are at the outskirts we can't match your needs, it's stupid. So, you need to be in a space where […] everything is walkable or bikeable" (Managing director CC_2).

These examples illustrate how social proximity is enhanced by offering an informal context and time for ambient conversation. Socializing thus strengthens the personalized trust within the cohort and can contribute to the emergence of strong social ties (Granovetter 1973) that outlast the limited timeframe of the program. In some cases, the cohort experience is enhanced by splitting up individual start-up teams. In cases, like "CEO dinners" or "CTO clubs" (Documents DC_1), the cohort is remixed in a way that brings together people from different teams with similar responsibilities. Social proximity is thus complemented by adding proximity along the cognitive (in the case of CTO clubs) or authority dimension (in the case of CEO dinners).

Socializing increases the awareness of being "one cohort" and enriches the social experience of the program (Drori/Wright 2018). The effects on knowledge creation are rather indirect. Yet, socializing adds social glue to a group that otherwise is held together mainly by instrumental considerations. In the case of more focused socializing events, like CEO-dinners, the higher degrees of cognitive or authority proximity transforms socializing into a more instrumental type of meeting during which crucial experiences and more specific tacit knowledge among "insiders" can be shared in an informal setting:

"We had CEO-dinners, we have had [...] monthly CEO-conversations where we would all talk about the business" (Start-up CEO_1 DC_1).

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4.5 Synchronizing meetings

This type of co-presence can be described as *"weekly meetings, during which goals are defined, but also progress is checked" (Start-up CEO_1 DC_2).* They are held regularly and usually gather the founders and team members of all start-ups. Hence, the typical constellation is one-to-many:

> *"Each week there was a standup meeting, and everybody had to state their PPP, being 'pain points', 'plans' and some other p [progress]. This should last five minutes and then they [the accelerator staff] told us what they expect from the week ahead. Insofar we were supervised" (Start-up CEO CC_6).*

The term "supervision" in the quote above provides an idea that distance along the authority dimension is all but absent in these situations. The distance along the authority dimensions is rooted in the fact that the accelerator organization is usually an investor in the participating start-ups:

> "*[My co-founder] is still convinced, they wanted to push us into a certain direction. Personally, I didn't think it was very intrusive, but it was like that to some degree*" *(Start-up CEO Berlin CC_1).*

At the same time, the management team and each entrepreneurial team share the interest of maximizing the start-ups' commercial success:

> "*This program is not anonymous, but that is OK, we follow similar goals. That means we sit in one boat*" *(Start-up CEO Amsterdam DC_2).*

Since the information presented is usually sensitive, trust between the participants is a necessary condition. These events are arranged to synchronize the teams' progress with the program's expectations and to fine-tune the recent progress and the overall perspective of the ventures. The open format provides opportunities to learn from the experiences of others as presented by peers.

4.6 Matchmaking events

Matchmaking events were termed situations of *"forced serendipity" (Program Manager DC_1)* by one interviewee. Matchmaking usually takes place during the first weeks of the program. Two different procedures have been described to us, one relying on the start-ups pitching their business model in front of an audience of mentors and/or industry partners, thus representing a sequence of one-to-many interactions, and the other rather resembling a *"speed dating with mentors" (Start-up CEO DC_2)* process, in which many start-ups interact with mentors in a series of short (few minutes) and rapidly reshuffling one-to-one conversations.

Matchmaking events are held to identify fruitful partnerships. Two types of matches need to be achieved: matches to mentors, who are valued as important advisors and providers of crucial knowledge about the industry context or specific technologies, and matches to industry partners, who serve as gatekeepers to future clients or suppliers.

Several dimensions of relational distance are present during matchmaking, often all at once. For instance, we registered the concurrence of organizational, cognitive, social and institutional distance in the case of start-up-industry partner interaction. Both authoritarian and social distance becomes an issue in the case of start-up-mentor interaction. At the same time, the operational staff seeks to moderate the effects of this multi-dimensional form of relational distance by carefully curating the social composition of both groups and by providing a spatial setting with increased mutual visibility and easy access (thereby reducing functional distance). This role as facilitator is based on previously established trustful relations to mentors, industry partners and participants.

The typical interaction during matchmaking is too superficial to contribute crucially to knowledge creation. Their *"big effect […] is to connect you to the right people" (Managing director DC_3).* The logic of matchmaking is to organize brokering in a highly efficient way. The conversation is focused to get some crucial pieces of information about the respective counterpart, to check the usefulness of a possible partnership and to test the degree of reciprocal interest of both parties.

> *"There is a thing called 'mentor-madness'. So, they bring in all these mentors, you speak with 160 different people [...] Every week there are two or three different like, in-person events, where people come in to give you, to talk with you. [...] I mean, you're, you're bombarded with introductions and, and people" (Start-up CEO_2 DC_1).*

Following this, seed accelerators can be circumscribed as "social relays" (Panitz/Glückler 2017: 148). During the program, a massive rewiring of social contacts and business relations takes place. This rewiring is partly facilitated by the initiative of individual brokers (Obstfeld 2018), who introduce new partners to entrepreneurial teams if they assess them as good fits. Matchmaking events take

place mainly at the beginning of an accelerator program. Later, the focus shifts towards the follow-up meetings with mentors and industry partners discussed next.

4.7 Co-creation sessions

Some of the relations to mentors or industry partners created in matchmaking events lead to a series of follow-up meetings in which start-ups and industry partners work together on a more sustained basis to advance a joint project. In co-creation projects with industry partners, the start-ups apply their technology in a new context. Examples from our data include solving an existing problem of a large corporation with the help of the start-up's new technology, co-developing a prototype according to the wishes of a corporate partner who then acts as a lead customer, or integration of the start-up's technology into the platform technology of a corporate sponsor. Co-creation usually takes place in a series of sessions and comprises few-to-few constellations. They vary greatly in terms of duration and frequency. Co-creation with mentors is usually located in meeting rooms at the seed accelerators' offices and typically is focused on the start-ups' business models or technology, while co-creation with industry partners can involve collaboration at the partner's sites, as it is focused mostly on the partner's problems and practices.

Co-creation is characterized by the same set of dimensions of relational distance as matchmaking. Partners must deal with dissimilarities in terms of organizational affiliation, institutional contexts and cognitive frames. However, in co-creation, these types of distance are not just registered; participants actually work on reducing the respective dissimilarities in order to come up with joint solutions. For instance, organizational and institutional distance is sometimes bridged by the accelerator staff who can act as intermediaries in cases of friction.

"And when they ran into problems of any kind, we always said: 'You can also address this to us directly and we will deal then with the industry partner. Maybe you don't want to have your fingers burnt or if you don't know how to handle something, let us know and we will moderate.' And so, we did. These are just different worlds, for example with a corporate, if the contact person is on vacation for three weeks and nothing happens, this is a no-go for start-ups because they do not understand the delay. […] Or if a corporate has to deal with a decision for three weeks because different levels are involved, but the start-ups needs to move on, then we will explain and moderate" (Program staff CC_7).

Cognitive frictions are symptoms of and opportunities for a recombination of distinct knowledge by the two parties. The physical co-presence of different partners provides "familiar access to diverse resources" (Vedres/ Stark 2010: 1156). The complexity of this task requires repeated and intense meetings in small groups, during which the project is negotiated and gradually implemented. Between these meetings are longer periods of absence, during which both parties work separately on implementing tasks negotiated during the meetings. These absences are often interrupted by virtual co-presence, however.

"We woke up to text messages from them. We fell asleep to e-mails with them. We had weekly calls with them. They were very hands-on" (Start-up CEO_1 DC_1).

The knowledge gained through co-creation sessions includes specific industry knowledge valuable for placing the start-ups' product or service on the market. Thus, co-creating can induce major transformations of the firm's business model ("pivots"). Pivots are relatively common and often encouraged by the accelerator's staff (*Managing directors DC_1, DC_2*). They occur either as intentional change induced by crucial knowledge inputs from mentors (*Start-up CEO_2 DC_1*) or as unintended side-effects of co-creation with industry partners (*Start-up CEO DC_3*).

"I have seen companies going through [our] accelerator that actively engaged the whole network of investors and mentors, made a very concrete plan, with whom to collaborate when. Then they went into concrete product tests [with them] and thus, after finishing the program were able to have something, few have: a proof of concept in the market and first clients" (Mentor DC_3).

While a successful project can be beneficial for the industry partner, it is of enormous value to an early-stage start-up, because implementing a product with a lead client provides an important proof of concept that can ease access to further investors and clients (Battistella/ De Toni/Pessot 2017).

4.8 Demo days

The demo day concludes the accelerator program. On these occasions, participants pitch their business models and show the progress they have made during the program to a larger audience, enacting a series of one-to-many situations in a rather standardized way

(ten-minute pitch). Demo days are highly visible events. They represent the largest format of co-presence (in terms of number of participants and diversity of groups represented). They are organized at large and prestigious venues, such as conference centres or fancy cinemas (*field notes*).

Demo days address external stakeholders, local start-up communities and even journalists, politicians or administrative actors. Most importantly, however, demo days attract many investors from local and non-local venture capital firms (*field notes*). They thus enact situations with multiple forms of relational distance. For the entrepreneurial teams, demo days provide unique opportunities to reduce the institutional and organizational distance to stakeholders from the corporate world and from venture capital by showing their business model in an adequate way (the pitch standard). Seed accelerators and start-ups are proximate with respect to a shared interest in the start-ups' growth.

The whole setting is designed to bridge relational distance through temporary co-presence. Yet the purpose is less knowledge creation, but rather knowledge capitalization. To a considerable degree, demo days are brokering events. Thanks to long-lasting ties and to a critical mass of pitches by promising start-ups it becomes possible to attract venture capitalists, who are difficult to mobilize otherwise. To raise mutual awareness (Grabher/Melchior/Schiemer et al. 2018) during demo days, investors and start-ups are easy to identify as both groups wear name tags with different colours (observed at several occasions; *field notes*). In addition, VIP areas, to which only these groups have access, are designated at demo days to make sure that confidential meetings can take place at short notice. After the event, exclusive "investor dinners" (*field notes*) are arranged to create another occasion to get in touch before the memories of the pitch performances fade.

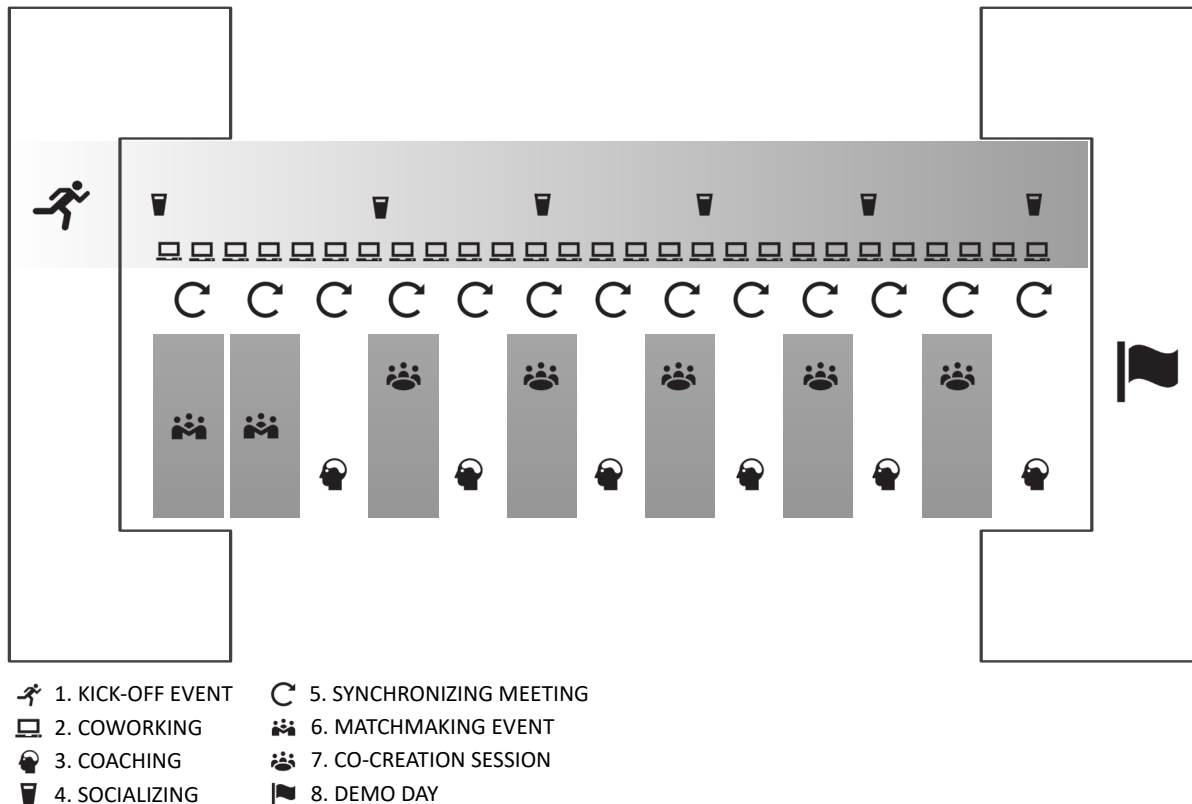# 5 Choreographies of co-presence in seed accelerators

Each format of co-presence bridges relational distance of different kinds and complexities and has distinct functions: from co-creating business-related knowledge, to enacting shared entrepreneurial practices, to offering opportunities for socializing and trust-building. Both forms of bridging described in Section 2.2 can be found

in different formats of co-presence, either combined or separate. An example of the former is coworking, during which both serendipitous encounters occur and intense collaboration is practised, while for example matchmaking events mostly serve to establish new ties. Further, bridging can either reduce relational distance (e.g. creating trust at socializing events) or leverage existing distances (e.g. re-combining cognitive frames of users and providers in co-creation events). Although the constellations of co-presence change constantly during the program, most of them take place in the fixed working space of the accelerator. Thus, the tempo-spatial framing stabilizes the otherwise complex combination of gatherings, thus proving the profound impact of the situation (Goffman 1963).

In this section, we foreground not the individual instances of co-presence, but rather the complex choreography enacted by the way in which interrelating occurs. We identified three distinct ways in which formats of co-presence work together in the course of time: temporal bracketing, blending and sequencing (see Figure 1).

5.1 Temporal bracketing and liminality

As mentioned earlier, the kick-off and demo days initialize and conclude the program. They constitute the most visible events of the program and draw a lot of attention from investors and other stakeholders. Together they constitute the institutionalized beginning and ending that make up a temporary organization and act as "brackets" for the whole program (for "temporal bracketing" see: Langley 1999: 703 f.). The kick-off is oriented inwardly. It initiates many of the processes that will gradually evolve during the program (e.g. building up trust within the cohort group). The demo day is oriented outwardly by attracting public attention and creating enhanced visibility *vis-à-vis* venture capital investors. While the kick-off encourages participants to leave behind everyday routines and to dedicate their attention to the program, the demo day seeks to reintroduce the start-up into everyday business. This order of events creates a sense of exceptionality that allows participants to work much harder than usual. The symbolic stepping back from routine and returning to routine creates a liminal experience (Tempest/Starkey 2004) that reassures participants that they are in a phase of transition, enhancing their readiness to pivot their business model.

1. KICK-OFF EVENT   5. SYNCHRONIZING MEETING
2. COWORKING   6. MATCHMAKING EVENT
3. COACHING   7. CO-CREATION SESSION
4. SOCIALIZING   8. DEMO DAY

Figure 1: Bracketing, blending and sequencing through co-presence during a seed accelerator program.

5.2 Blending – creating a local entrepreneurship community

To achieve the overarching aim of boosting the growth of the participating firms, seed accelerator programs create a temporal local entrepreneurship community. This complex aim, however, cannot be reached with a single format alone, but rather requires an overlap of different types of co-presence. The initial bracketing event is the first of several upcoming instantiations of socializing, combined with daily coworking in a shared office environment. This creates a sense of belonging and cohesion within a group of people who initially develop individual and independent projects. This cohesion offers opportunities to share practices, as participants work together to foster social proximity and initiate and develop personal trust (Growe 2018). This, in turn, facilitates mutual assistance and enriches side-by-side coworking with the mutual awareness of participants for each other (Grabher/Melchior/Schiemer et al. 2018). Moreover, mutual awareness of the comparability of the situation shared by all the start-ups is fostered by synchronizing meetings, which are held to keep the

teams on track, and the sense of exceptionalism created through the kick-off event, spurring individual motivation and peer-to-peer competition to encourage much harder work than usual.

5.3 Sequencing – spurring intense collaboration in a short timeframe

Developing the participating start-ups in a co-creative way is another core feature of seed accelerator programs. This is achieved through new, yet intense partnerships between start-ups and mentors or industry partners, who help create crucial knowledge. Due to the limited timeframe of the program, the actual brokering of connections is required early on and needs to be organized in a highly efficient manner. Therefore, at the beginning of programs matchmaking events take place to efficiently produce many new ties. This abundance of superficial contacts is necessary to identify those few promising matches that lead to sustained collaboration in co-creation relationships. The latter, in contrast, need sustained and intense collaboration to afford cumulative

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learning. A series of co-creation sessions requires both the intense immersion of participants into the other's practices and concentrated work with peers in the well-known context. Sequencing is more than just arranging co-presence. Rather, the complex and cumulative process of recombining knowledge that belongs to habitually separate domains requires purposeful ways of alternating between presence and absence. Temporary co-presence is helpful to appreciate nuances of the respective counterpart's needs, while phases of absence are needed for implementation and evaluation, and still can be interrupted by virtual co-presence.

6 Conclusions

Our empirical analysis of seed accelerator programs in the four regions of Amsterdam, Berlin, Detroit and Hamburg revealed that seed accelerator programs take advantage of the contingencies that arise when people with diverse backgrounds come together in open-ended situations of physical co-presence. We were able to show that physical co-presence offers a means to enact relational distance and to bridge this distance for the benefit of entrepreneurial processes. While some types of co-presence are used to reduce relational distance, for instance through socializing, other formats capitalize on the underlying frictions by recombining elements of otherwise distinct practices. While the present discourse considers that physical co-presence often coincides with relational proximity (Bathelt/Henn 2014), we were able to show that it constitutes one way of enacting the productive effects of relational distance as well.

All eight identified formats of co-presence are arranged with great care by professional managers of the seed accelerator organization. Also, the presence of overlapping dimensions of relational distance results from careful social curation. Temporary physical co-presence creates different situations in which different constellations unfold social dynamics with surprising effects and unforeseeable outcomes. It is important to note that the eight different types of co-presence identified here do not work in isolation, but are part of a carefully designed choreography intended to develop the progress of start-ups participating in seed accelerator programs. By consciously enacting bracketing events, by sequentially combining situations of presence and absence, and by consciously blending several formats together, accelerator operators organize a complex open-ended process with a higher probability of coming up with commercially successful entrepreneurial

projects. It is exactly this dialectic of enabling seemingly serendipitous encounters by directing the process that lies at the core of seed accelerators as a new organizational form. These findings complement the existing debate on the supportive effects of temporary co-presence on knowledge creation, as it foregrounds the strong agency of managers organizing the already described "anarchic" (Bathelt/Gibson 2015) effects of temporary co-presence.

While our prime aim is to analyse seed accelerators as a new organizational form that takes advantage of the dynamics of physical co-presence and the effects of relational distance, we also aim to contribute to the literature by uncovering different formats of co-presence and unveiling the complex interplay of different dimensions of relational proximity and distance within them. Further, we draw attention to the way in which management teams in seed accelerators organize co-presence in purposeful ways and on behalf of venture capital investors, and we thus also unveil underlying power asymmetries, another understudied topic in the literature on temporal clusters. These issues are crucial to understanding seed accelerator programs but are also valuable for the investigation of other cases as well. We advocate analysing sequences of co-presence through the lens of a process perspective, since this perspective enables the analysis of interrelations between them.

Finally, we concentrated our analysis on seed accelerator programs themselves. Of course, entrepreneurial processes begin earlier and have future perspectives. Thus, there are potentially more types of co-presence and additional choreographies that remained beyond the scope of our present study. A perspective that considers the tensions between the seed accelerators as a permanent organization and the temporary programs would be a promising avenue of future research. From this perspective, it would, for instance, be possible to study the evolution of types of co-presence over time and the kind of good practices that crystalize over several iterations of similar programs.

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