Role of Accelerator Program in Development of Nascent Entrepreneurs' Social Networks

Kaisa Hytönen
Senior Research Fellow
Department of Management and Entrepreneurship
Turku School of Economic
University of Turku
Rehtorinpellonkatu 3
20500 Turku, Finland
Email: kaisa.hytonen@utu.fi
Phone: +358503316583

Sanna Ilonen
University Teacher
Department of Management and Entrepreneurship
University of Turku, Finland

Pekka Stenholm
Senior Research Fellow
Department of Management and Entrepreneurship
University of Turku, Finland

Keywords: nascent entrepreneurs, social networks, accelerator program, venture creation, social network analysis

Abstract

Objectives: The purpose of this study is to examine the development of nascent entrepreneurs' social networks during an accelerator program. We examine whether participants establish network ties at 1) the overall network level (among all participants), 2) within and between business- or gaming-oriented startup teams, or 3) on a personal level.

Prior Work: Social networks where individuals are connected to build formal and informal social capital are considered as highly important sources of collaboration, advice, inspiration and guidance for nascent entrepreneurs. Simply knowing who to ask for advice can strengthen new venture creation process and sufficient diverse networks help to cope with the challenges faced by nascent entrepreneurs. The importance of social networks that provide access to funding, information, knowledge and support for entrepreneurs and entrepreneurial processes is widely demonstrated but less attention has been paid on the origins of the networks and the formations of network relationships.

Approach: This study was conducted in the context of a startup accelerator program organized by ES in Finland in the summer of 2021. We collected the data by administering a social networking questionnaire to all 31 participants of the accelerator program at the beginning and at the end of the program. The response rates of both questionnaires were 100%. The data were analyzed using social network analysis.

Results: Our findings show that the accelerator program supported the emergence of nascent entrepreneurs' social networks regarding both venture creation and spare time networks. Networking increased among all participants and at the team-level. In addition, the number of participants' personal networking ties increased. The development of social networks differed between business- and gaming-oriented teams as interaction increased more among gaming-oriented teams than among business-oriented teams. In addition, interaction was low between the business- and gaming-oriented teams.

Implications and Value: Our study illustrates how social capital starts to emerge through the development of social networks already during the early stages of a new venture creation process. Our study provides a new understanding how the activities provided for nascent entrepreneurs support the building of important social networks and social capital. Our findings also have implications for practitioners who run accelerator programs. If one is willing to intentionally boost the emergence of social networks and social capital among the participants, the scrutiny of participants should also address that possibly competing ideas, teams and entrepreneurs can hinder this aim.

Introduction

The early stages in the emergence of a venture are filled with uncertainty in front of which entrepreneurs need to decide and act oftentimes quickly. Being shy with necessary information needed in making judgements, entrepreneurs may face challenges that may even jeopardize the survival of their new venture. If new entrepreneurs are, however, equipped with someone to ask for help, support or even finance (Semrau & Werner, 2014), the chances of new venture survival are improved (Davidsson & Honig, 2003). The social structures, networks, and memberships in which individuals are connected to build formal and informal social capital (Lin et al., 1981) are considered as a highly important an asset for nascent entrepreneurs (Bauernschuster et al., 2010; Walker et al., 1997).

However, although nascent entrepreneurs are provided with communities that offer them invaluable sources for building social connection and capital (Audretsch et al., 2011), the understanding of the emergence social networks of new entrepreneurs remains still underdeveloped (Stuart & Sorenson, 2008). The importance of social networks for entrepreneurs and entrepreneurial processes is widely demonstrated but less attention has been paid on the origins of the networks and the formations of network relationships. Previous research acknowledges that social capital can be built by being surrounded by entrepreneurial individuals, such as family members or friends with entrepreneurial background (Davidsson & Honig, 2003). Moreover, researchers suggest that participation and membership in an entrepreneurial community can provide tacit knowledge to develop human capital and legitimacy (Bauernschuster et al., 2010; Phelps et al., 2012; Shepherd et al., 2021; Stam, 2015), which can translate into social capital. In goal-driven communities, such as accelerator programs, the building of social networks can be suppressed by the focus on developing nascent entrepreneurs' business ideas and preparing them for the launch of new ventures. Hence, the emergence of social networks and, thus capital is often taken for granted, although researchers have rarely looked for evidence to support this assumption.

The purpose of this study is to investigate the nature and emergence of networks of nascent entrepreneurs during their participation in an accelerator program. Our longitudinal research design enables us to study the early stages of building social networks among 31 nascent entrepreneurs. Our data are collected in early and latter stages of an 8-week long accelerator program during summer of 2021. Program had two streams for business and gaming-oriented startup teams. In this study, we focus on venture creation and spare time -related social networks. Concerning both types of social networks we examine whether participants establish network ties at 1) the overall network level (among all participants), 2) within and between business- or gaming-oriented startup teams, or 3) on a personal level.

Our study provides understanding of how goal-driven and informal social networks emerge among nascent entrepreneurs in the context of an accelerator program. Our findings show that nascent entrepreneurs tend to engage in venture creation related interaction with individuals with whom they already are familiar with. However, the findings show that shared and common interest among the individuals may boost the emergence of social networking interaction. Theoretically, our findings stress that social networking does not build solely via the scope of memberships in a community, but also the type of relationships defines how a community can support the emergence of social networks and, thus social capital. After all, same relationships can be perceived differently by different individuals (Kilduff & Krackhardt, 1994). Accordingly, our findings have implications for practitioners who design and run accelerator programs. If one is willing to intentionally boost the emergence of social networks and social capital among the participants, the scrutiny of participants should also address that possibly competing ideas, teams and entrepreneurs may hinder the emergence of social capital.

Theoretical background

Social networks provide an access to social capital, as they enable people to share and receive information, knowledge, resources and skills, and get new ideas to be utilized in their own contexts (Adler & Kwon, 2002; Semrau & Werner, 2004). Social networks play a crucial role in explaining the processes of knowledge creation, dissemination and utilization as they affect how individuals and teams access, transfer and apply knowledge (Phelps et al., 2012). Accordingly, they can influence individuals' behavior by influencing their decisions and actions, creating legitimacy for those within a network, and developing and enhancing individuals' identities (Lin et al., 2001). The patterns of relationships between actors, the nature of resources exchanged, and mechanisms through which the networks are maintained define how social networks look like and how they function (Hoang & Antoncic, 2003). The usefulness of social networks requires trust and social values between network members because they strengthen the social ties, and trustworthy ties provide information that members believe to be accurate (Kwon et al., 2013; Putnam, 2000; Shane, 2003).

The role of entrepreneurs' social networks in supporting the success and sustainability of new ventures has been widely discussed and demonstrated (Aldrich & Zimmer 1986; Pirolo & Presutti, 2010). Entrepreneurs build and utilize their social networks to recognize business opportunities (Davidsson & Honig, 2003; Ozgen & Baron, 2007; Shane, 2003), obtain resources for growth (MacPherson & Holt, 2007; Shane & Cable, 2002) and to build their venture. For example, sharing information about locations, physical markets, sources of funding and ways of organizing one's business are crucial forms of dissemination and utilization of social networks (Shane, 2003). Further, an entrepreneur's social capital can assist in gaining access to, for example, business advisors, venture capitalists, customers and/or suppliers (Baron & Markman, 2000).

The basic constituents of social capital are not only membership of networks themselves per se, but the nature of social networks determine what kind of social capital is provided and accessible through networks. The emergence of social capital is dependent on the size and scope of the network, the number of people in an individuals' personal network as well as diversity of the network connections (Rajagopal et al., 2012). The likelihood of receiving valuable resources increases with more membership in individuals' social network. However, the emergence of social capital cannot be explained simply by the number of nodes of social networks (Adler & Kwon, 2002). Diverse and heterogeneous networks, in particular, play a crucial role in assisting nascent entrepreneurs in navigating the multifaceted challenges they encounter (Engel et al., 2017). For example, nascent entrepreneurs targeting international markets stand to gain significantly from connections that not only offer valuable support during the early stages of a new venture but also draw from the experiences of those with experience in international markets. Consequently, an adequately broad array of social network connections provides both pipes for the exchange of information and resources among networks actors and prisms through which the qualities of potential collaborators can be assessed (Podolny, 2001). In addition, expanding contacts to more distant actors help an individual to gain access to a wider range of information (Cope et al., 2007).

Increased social capital, intangible resources and informal support achieved through networks have been found to be particularly important in supporting new businesses and entrepreneurial behavior (Shepherd et al., 2021). However, among nascent entrepreneurs, defined as entrepreneurial individuals in the process of creating and organizing a new venture, the availability of social networks and, thus, access to vital social capital may be constrained. Access to social networks is pivotal in providing nascent entrepreneurs with the essential elements of collaboration, advice, inspiration and guidance (Saxton et al., 2016) necessary for their ventures' success and survival (Chatterji et al., 2019). In general, simply knowing who to ask for advice can strengthen the venture creation processes of nascent entrepreneurs (Sarasvathy, 2001).

During the early stages of entrepreneurship, the development and access to connections and memberships have been facilitated through various means, including trade fairs, incubators and accelerator programs (Audretsch et al., 2011; Pittaway et al., 2010), to name a few. These platforms serve as catalysts for nascent entrepreneurs, aiding them in the formation of new skills and competencies that are relevant in business life (Wright et al., 2017) and social capital critical for acquiring knowledge and resources for their ventures (Aldrich, 1999). In this study, we focus examining an accelerator program as a facilitator of nascent entrepreneurs' social networks. Accelerator programs are defined as learning-oriented limited-duration programs that provide support, education and mentoring for early ventures and their entrepreneurs (Cohen, 2013). Recent research shows that many accelerator programs are efficient in substantially aiding venture development and supporting learning of early ventures (Hallen et al., 2020). They help nascent entrepreneurs to shape the business ideas and identify potential markets, support learning in terms of providing procedural and declarative knowledge and skills as well as increase the likelihood and the speed of reaching outcomes (Hallen et al., 2020). Importantly, participation in an accelerator program provides nascent entrepreneurs an access to intangible resources and informal support that has been found to be particularly important in new venture creation (De Carolis et al., 2009; Shepherd et al., 2021). Extensive consultation of external mentors representing a great variety of knowledge sources have proven to be the key factor of a successful accelerator program (Hallen et al., 2020). In addition to wider networks, accelerator programs provide nascent entrepreneurs with a readily available interdisciplinary network of like-minded people sharing an interest in entrepreneurship (Preedy & Jones, 2017).

Social networks can be built directly on the primary mission of the networked actor. Ferri et al. (2009) emphasized that entrepreneurs with high value social capital, as manifested through memberships of social networks and the benefits that accrue from those memberships, are more likely to attain their goals, such as creating a new venture. Accordingly, nascent entrepreneurs can build their social networks to get access to information, mentors, funding and similar sources of social capital directly linked to their venture creation. In a community, this sort of bridging social capital allows different members to share their common interest (Westlund & Gawell, 2012). Research shows that in regards to fostering innovation, interaction amongst firms enables knowledge spillover that is defined as a positive influence that a firm or a group receives when

exploiting knowledge or learning from other firms or groups, and creates a learning space and processes that promote innovation (Acs et al., 2009; Capello & Faggian, 2005).

Further, informal social networks not directly related to the formal primary mission can build important connections and promote emergence of bonding social capital that support the intended activities within the social network (Westlund & Gawell, 2012). Such mutual acquaintances can be linked to access to actual or potential resources embedded in social networks (Bourdieu, 1986). Bonding social capital can reflect a membership in voluntary association (see e.g., Putnam, 2000), in which the networking and the related resources are linked via collective and shared interests among its members. In this study, we address the development of both goal-driven venture creation networks and more informal spare time networks among nascent entrepreneurs at the context of an accelerator program.

Methodology

Study context

This study focuses on one accelerator program organized by an Entrepreneurship Society in Finland. Entrepreneurship Societies (ES) provide their members and wider audiences with events and programs that focus on entrepreneurship or entrepreneurial behavior. In all, there are 9 active ESs in Finland of which the case organization is the second oldest and founded in 2009. ESs are considered to link early stage entrepreneurs together across disciplines, and thus to create interdisciplinary networks. Physically they locate close to local universities and therefore they operate contextually between business-life and educational institutions (Ainamo et al., 2021; Björklund & Krueger, 2016). In addition, they operate as communities in which a group of people share an interest in entrepreneurship and engage in creating bonds between them (Lave & Wenger, 1991). Accordingly, ESs offer opportune environments for building social networks between nascent and experienced entrepreneurs (Pittaway et al., 2010; Siivonen et al., 2019). Social learning in a variety of forms with and from other entrepreneurs is one of the learning benefits of ES activities, such as working on collaborative projects and gaining awareness from experienced entrepreneurs (Pittaway et al., 2015).

Participants

This study was conducted in the context of a startup accelerator program organized by ES in Finland in the summer of 2021. This particular accelerator program takes place yearly and it aims to help early-stage entrepreneurs and startups develop their ventures. To be able to apply the accelerator program, the participants need to have an initial business idea and full-time commitment from team members. The accelerator program is free of charge for the participants. Students from local higher education institutions are eligible to get up to 15 credits from participating in the accelerator program. The program included different kinds of learning-oriented practices concerning refining business ideas, creating prototypes, conducting market research and preparing for launch. The weekly schedule of the accelerator program included four days of working; workshops, team coaching, pitching workshops, mentoring sessions and working on startup. The themes covered during the program concerned idea evaluation and team development; customer validation and product-market-fit; business model and strategy; product development; traction and growth, sales and marketing; funding and finances as well as pitching. At the end of the program, the participants had an opportunity to pitch their startups to investors and continue developing their business ideas with ongoing support and guidance from ES. During the accelerator program, the participants got to work closely with 80 experienced mentors and industry experts.

The participants of the particular accelerator program were 31 nascent entrepreneurs (6 females and 25 males) (Table 1). 24 participants were Finnish and 7 participants were exchange students with multicultural backgrounds. The participants' age ranged from 21 to 37. The participants of the program formed 11 startup teams, six of which were business-oriented (2-3 team members in each team) and the rest focused on gaming (2, 4 or 5 team members in each team).

Table 2. Participants

ID	Gender	Age	Nationality	Track	Team	Team size
P1	Male	20-24	International	Business	1	2
P2	Male	20-24	Finnish	Business	1	2
P3	Male	35-39	Finnish	Business	2	2
P4	Female	35-39	International	Business	2	2
P5	Female	35-39	Finnish	Business	3	2
P6	Female	35-39	International	Business	3	2
P7	Male	25-29	Finnish	Business	4	3
P8	Male	25-29	International	Business	4	3
P9	Male	20-24	International	Business	4	3
P10	Male	20-24	International	Business	5	2
P11	Male	20-24	Finnish	Business	5	2
P12	Male	30-34	Finnish	Business	6	2
P13	Male	30-34	International	Business	6	2
P14	Male	25-29	Finnish	Game	7	4
P15	Male	20-24	Finnish	Game	7	4
P16	Male	20-24	Finnish	Game	7	4
P17	Male	20-24	Finnish	Game	7	4
P18	Male	20-24	Finnish	Game	8	5
P19	Male	25-29	Finnish	Game	8	5
P20	Male	20-24	Finnish	Game	8	5
P21	Male	25-29	Finnish	Game	8	5
P22	Male	20-24	Finnish	Game	8	5
P23	Female	20-24	Finnish	Game	9	5
P24	Male	30-34	Finnish	Game	9	5
P25	Male	20-24	Finnish	Game	9	5
P26	Female	20-24	Finnish	Game	9	5
P27	Male	20-24	Finnish	Game	9	5
P28	Male	20-24	Finnish	Game	10	2
P29	Female	25-29	Finnish	Game	10	2
P30	Male	20-24	Finnish	Game	1	2
P31	Male	20-24	Finnish	Game	1	2

Data collection

Our data were collected by administering a social networking questionnaire to all 31 participants of the accelerator program at the beginning and at the end of the program. The organizers of the accelerator program assisted us in collecting the data and asked participants to respond to the questionnaire in the first and the last meeting of the accelerator program. All participants responded to both questionnaires, so the response rates were 100%. Collecting networking data longitudinally (pre- and post-data) allowed us to examine how the networking connections changed during the program. The social networking questionnaire included a name list of all participants. In order to examine venture creation and spare time connections, the respondents were asked to rate, in relation to other participants and their new venture, 1) who they cooperate with, 2) who they ask for professional advice, 3) who they brainstorm/ideate with and 4) with whom they spend their spare time. The questionnaire was dichotomous in nature meaning that the participants were asked to rate whether a social relation existed or not.

Social network analysis

We used UCINET 6 program (Borgatti et al., 2002) for data analysis. To simplify the analysis, and based on the high correlations between the networks, we merged cooperation, advice seeking and ideation networks (questions 1–3 in the networking questionnaire) as one venture creation network. The correlations calculated with QAP-correlation analysis ranged from 0.42 to 0.79.

Concerning all three research questions, we examined the venture creation network, that revealed how the participants of the accelerator program collaborated, sought for advice or brainstormed with each other in

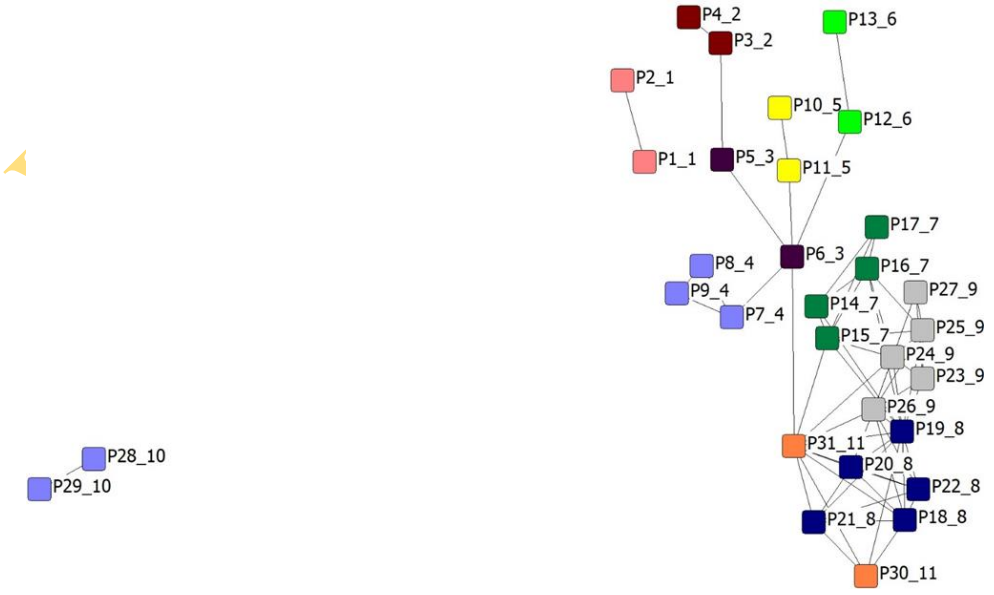
relation to venture creation, and the spare time network, that revealed how participants of the accelerator program spent spare time with each other. Both networks were treated as not reciprocal meaning that a connection between two individuals was not necessarily acknowledged by both participants. We ran all analyses for the pre and post data to examine the development of the networks.

To answer the first research question, the network cohesion of the venture creation and the spare time networks was analyzed by density and centrality measures at the overall network level, that is among all participants. We examined density, that is the general cohesion of the network (number of ties), and centralization, that is the tie distribution among the participants. The networks were dichotomized for the analysis. Both measures are as percentages which indicate the relative number of existing ties in relation to all possible ties. The overall network connections were visualized with NetDraw program. To answer the second research question, the density of the venture creation and spare times networks was calculated inside and between business- and gaming-oriented tracks and teams. We answered the third research question by examining the venture creation and spare time ties at the personal level. We calculated Freeman's in-degree measurement which indicated for how many other participants the individual was a venture creation or spare time connection. It indicates the number of incoming linkages as it is based on peer evaluation.

Results

Social networks among all participants

To unfold the nature and development of overall venture creation and spare time networks, we examined whether the participants created networking ties with one another during the accelerator program. We analyzed the change in the density and centralization of the interactions in both networks among all participants. (Figure 1). The results show that the density of venture creation interaction increased from 11% to 20%. This indicates that some participants had already collaborated, sought for advice or brainstormed before the accelerator program, but participation in the program enabled increasing such interaction among all participants. The results show that the spare time interaction increased from 9% to 15%, which suggests that the accelerator program also supported informal social networking among all participants. The results revealed that centralization of venture creation interaction increased from 13% to 18% and the centralization of spare time interaction increased from 18% to 23%. This indicates that about one fifth of interaction was centralized around certain participants at the end of the accelerator program. Otherwise, networking relations were rather evenly distributed among the participants. Further, QAP-correlation analyses indicated that the participants often had venture creation related interaction with the same people they spend spare time with. The correlation between venture creation and spare time networks at the beginning of the program was 0.64 and at the end of the program was 0.62.



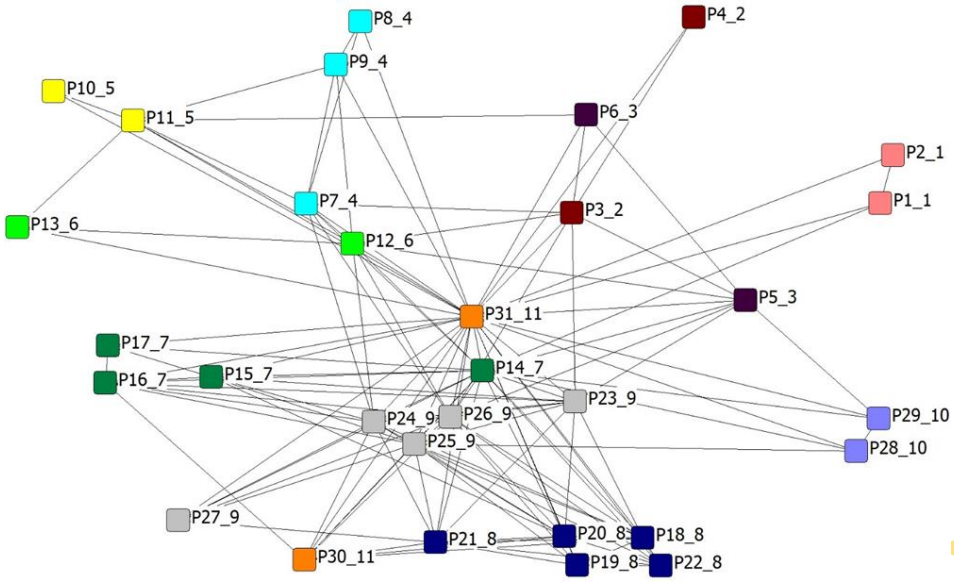
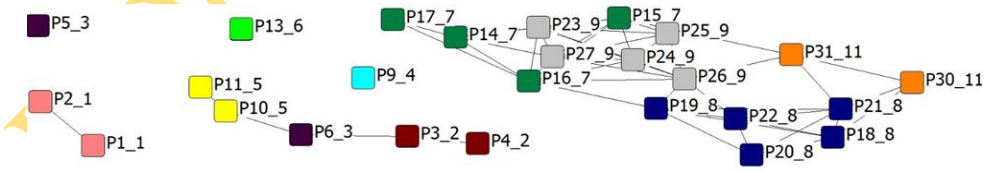
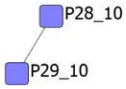


Figure 1. Venture creation network in the beginning (top) and at the end (bottom) of the accelerator program.
The graphs in Figure 1 are based on multidimensional scaling (MDS) and visualized by using NetDraw program. They reveal venture creation interaction between the participants of the accelerator program. Each participant has a personal code (e.g. P1_1) including ID and a team number. Each team is marked by a different color.

In addition, we examined the venture creation and spare time interaction among all participants by network visualization based on multidimensional scaling. Network visualizations of the venture creation network in the beginning and at the end of the accelerator program are presented in Figure 1 and the spare time network in Figure 2. The lines represent a venture creation or spare time interaction between the participants. Participants who are located close to one another are engaged in denser networking interaction than remotely located participants. Figure 1 indicates that in the beginning of the accelerator program, venture creation interaction was rather scattered. Concerning especially business-oriented teams, there was interaction mainly between the members of each team. However, the figure reveals that the interaction was not completely centered inside the teams but some participants had venture creation interaction with members from other teams as well indicating that they knew each other beforehand. At the end of the program the interaction was expanded and there were more connections between the participants from different teams. The figure reveals that each participant had venture creation connections outside his or her own team. Our results illustrate that in the beginning of the accelerator program the participants spent spare time almost only with their team members. Some teams did not have internal spare time interaction. The figure indicates that spare time interaction increased especially among the teams belonging to the gaming-oriented track.





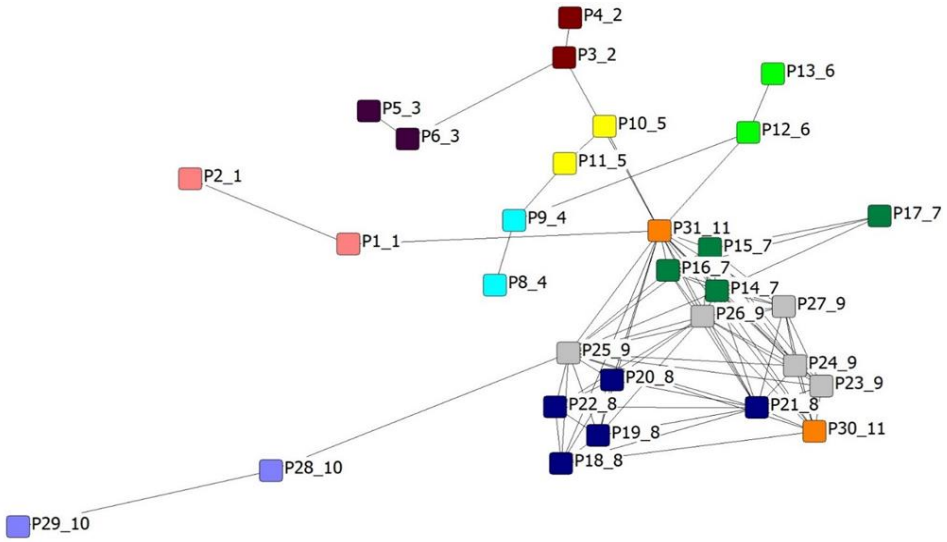


Figure 2. Spare time network in the beginning (top) and at the end (bottom) of the accelerator program. The graphs are based on multidimensional scaling (MDS) and visualized by using NetDraw program. They reveal spare time interaction between the participants of the accelerator program. Each participant has a personal code (e.g. P1_1) including ID and a team number. Each team is marked by a different color.

Social networks among business- and gaming-oriented tracks and teams

Social networking among business- and gaming-oriented startup tracks and teams was analyzed by examining the change of the density within and between the tracks and teams. The results show that the density of mutual interaction in the gaming-oriented track increased from 26% to 41%. This is much more than in the business-oriented track that increased the mutual interaction from 13% to 19%. Similarly, the gaming-oriented track increased its mutual spare time interaction from 22% to 38%, but in the business-oriented track mutual interaction remained the same (10%). Interestingly, the interaction between the participants of business- and gaming-oriented tracks was low (10%) regarding venture creation ties and almost non-existent (2%) regarding spare time ties at the end of the training.

Table 2 provides the pre- and post-density measures for each team and between the teams. 100% means that all connections exist whereas 0% illustrates none existing connections between the team members or teams. The measures show that network relations between the participants were to large extent based on the teams in the beginning of the training but some interaction evolved between the teams during it. This effect can be observed especially among the game-oriented teams. In all but one team the interaction has either grown to or remained 100% meaning that at the end of the program all team members are in contact with each other.

Table 2. Density measure (%) inside and between teams

Team	T1 I	T1 II	T2 I	T2 II	T3 I	T3 II	T4 I	T4 II	T5 I	T5 II	T6 I	T6 II	T7 I	T7 II	T8 I	T8 II	T9 I	T9 II	T10 I	T10 II	T11 I	T11 II
T1	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T2	0	0	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T3	0	0	50	50	100	100	17	0	50	25	25	0	0	0	0	0	0	0	0	0	25	25
T4	0	0	0	17	0	0	100	100	0	33	0	33	0	0	0	0	0	7	0	0	0	0
T5	0	0	0	0	0	0	0	0	1	100	0	0	0	0	0	0	0	0	0	0	0	0
T6	0	0	0	25	0	25	0	17	0	50	100	100	0	0	0	0	0	10	0	0	0	0
T7	0	13	0	0	0	13	0	8	0	0	0	13	92	100	0	20	25	65	0	25	13	63
T8	0	0	0	0	0	0	0	0	0	0	0	0	15	10	100	100	16	40	0	0	50	40
T9	0	0	0	20	0	20	0	20	0	0	0	10	55	60	16	56	100	100	0	10	10	100
T10	0	0	0	0	0	25	0	25	0	0	0	0	0	0	0	0	0	0	100	50	0	0
T11	0	50	0	50	0	50	0	50	0	50	0	50	13	50	60	70	20	100	0	50	100	100

The measures are presented as percentages.
The venture creation and spare time networks has been merged for the analysis
I: In the beginning of the accelerator program
II: At the end of the accelerator program

Social networks at personal level

At the personal level, social networking of each participant was examined by analyzing the number of personal networking ties and the change in the number of ties from the beginning to the end of the accelerator program. This was examined by relying on peer evaluation based on Freeman's in-degree. The number reveals how many participants of the accelerator program selected the actor in question as a venture creation or spare time contact. The results show that participants' personal networking ties increased with regards to both venture creation and spare time networks. The average number of venture creation ties increased from 3.2 to 5.9 (*SD = 2.8*) and of spare time ties from 2.6 to 4.4 (*SD = 3.2*). Participants' personal in-degree measures reveal that there were three persons whose venture creation connections estimated by other participants increased more than others'. Two of them (P3 and P5) belonged to the business-oriented track and one (P31) belonged to game-oriented track.

Table 3. Personal in-degree measures

ID	Venture creation I	Venture creation II	Spare time I	Spare time II
P1	1	3	1	2
P2	1	2	1	1
P3	2	8	1	2
P4	1	2	1	1
P5	1	7	0	1
P6	1	2	0	0
P7	3	6	2	2
P8	2	3	2	2
P9	4	4	2	2
P10	1	2	2	1
P11	2	7	1	2
P12	2	6	1	3
P13	1	2	3	1
P14	4	6	2	6
P15	5	7	5	7
P16	6	7	8	7
P17	2	3	2	2
P18	6	11	4	6
P19	6	7	3	6
P20	6	10	4	7
P21	5	9	2	5
P22	6	8	4	5
P23	4	9	5	9
P24	7	10	5	9
P25	4	7	5	9
P26	5	5	5	11
P27	4	6	5	9
P28	1	3	1	1
P29	1	3	1	1
P30	4	8	2	8
P31	4	10	4	8
M	3.2	5.9	2.6	4.4
SD	2.0	2.8	1.9	3.2

I: In the beginning of the accelerator program
II: At the end of the accelerator program

Discussion

Our study was set out to investigate the development of social networks of nascent entrepreneurs. We studied this with a longitudinal research design among nascent entrepreneurs who participated in an accelerator program organized by ES. Our findings show that, in total, an accelerator program supports the emergence of nascent entrepreneurs' social networks. Our results illustrate that nascent entrepreneurs tend to initially leverage their pre-existing social contacts. This concerns both goal driven venture creation networks as well as informal networks. However, the participation in the accelerator program also leads to an expansion of the social network through the establishment of new contacts. Interestingly, we observed variations across the different tracks within the accelerator program. Specifically, teams focusing on gaming appeared to increase their interaction more compared to those in the business-oriented track. Notably, gaming-oriented teams exhibited a greater propensity for engagement in both goal-related venture creation interaction and informal spare time interaction.

Previous research has revealed that in student-led entrepreneurial groups participants are willing to network with other students who are different to oneself and, therefore, could spark new ideas (Preedy & Jones, 2017). In this regard, our results differ as they show that the construction of social networks differed between business- and game-oriented teams, even all teams belonged to the same accelerator program. Both venture creation and spare time interactions were denser in gaming-oriented teams. This may indicate that game-oriented teams share a common interest in gaming whereas business-oriented teams might see themselves as competitors. Theoretically, this suggests that shared and common interest may boost the emergence of social networks and social capital, but a perceived risk of having a competitive role between the members may challenge it. Moreover, this finding reflects the differences in self-interest and varying values and motivations influence how willingly participants share resources with others (Etzoni, 2001; Uzzi, 1999). This notion is supported when the results showed that the interaction between business- and gaming-oriented teams was low throughout the accelerator program and despite the type of social network. Similarly, the differences in interaction between teams and their nascent entrepreneurs may reflect the lack of trust in teams with different focuses. Low levels of trust and differences in social values between the members may also lower the usefulness of social networks and generation of strong ties (Kwon et al., 2013; Putnam, 2000).

Previous research suggests that the size of the social network and the strength of its ties have a positive effect on the venture creation processes (De Carolis et al., 2009). Accordingly, our findings suggest that a membership of such community aid the participant in formation of new social capital which may be critical for acquiring knowledge and resources for their ventures (Aldrich, 1999) and the use of which may increase even later in life (Lin et al., 1981). Our results showed that individual participants grew their social networks with few new contacts with regards to both venture creation and spare time networks. Even only one new contact can be extremely valuable for the continuity of the newly created venture (Sarasvathy, 2001). For individual participants and teams, participation to the accelerator program might have led to latent social connections, which are not actively utilized and maintained at the moment but exist when needed in the future.

We acknowledge the limitations of this study, some of which are avenues for further research. One of the limitations is related to the fact that only one accelerator program was studied. Therefore, research including several accelerator programs is needed to better understand the phenomenon of nascent entrepreneurs' social network development and distribution of social capital. In addition, this study focused on the development of networks only during the accelerator program. In the future, there is a need for a longitudinal approach and follow up measurements to understand the long-term effect that participation to the accelerator program may have on the nascent entrepreneurs' social networks and ventures. It would be interesting to examine whether social network connections continue to exist and develop after the accelerator program. Further, the network data only reveal social structures concerning networking. Future studies based on both quantitative and qualitative data are needed to better understand the factors and predictors of successful networking in the context of an accelerator program, for instance, what personal characteristics of the nascent entrepreneurs or conditions of the accelerator program explain and predict social networking at different levels. Similarly, the flow of tangible and intangible resources accessed via emergent social networks should be taken into closer scrutiny, because our analysis did not allow such examination. Making sense of how the nature, scope and type of social networks and single connections shape the access to different resources would be valuable asset in designing accelerator programs. It would also be beneficial to explore the key actors whose networking connections increased more than others to understand their role in the development of nascent entrepreneurs venture creation networks.

In conclusion, our study illustrates how social capital starts to emerge already during the early stages of new venture creation process. Our study provides a new understanding of how the activities provided for nascent entrepreneurs support the building of important social networks and social capital. The findings emphasize that this emergence is not automatic nor do they distribute evenly between the members in the network.

Accordingly, the findings have implications for practitioners who run accelerator programs. If one is willing to intentionally boost the emergence of social networks and social capital among the participants, the scrutiny of participants should also address that possibly competing ideas, teams and entrepreneurs can hinder this aim. Therefore, practitioners should seek beyond nascent entrepreneurs' skills, motivations and their venture's aims to avoid situations which would jeopardize the emergence of social capital. In addition, networking needs to be supported with deliberate and sustained efforts.

References

Acs, Z. J., Braunerhjelm, P., Audretsch, D. B. & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics,* 32, 15–30.

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. *Academy of Management Review*, 27(1), 17–40.

Ainamo, A., Pikas, E., & Mikkelä, K. (2020). University ecosystem for student startups: A 'platform of trust' perspective. In *International Conference on Interactive Collaborative Learning*, 269–276. Chalm: Springer.

Aldrich, H. (1999). *Organizations evolving*. London: Sage.

Aldrich, H. & Zimmer, C. (1986). Entrepreneurship through social networks. *California Management Review,* 33(1), 261–281.

Audretsch, D. B., Aldridge, T. T., & Sanders, M. (2011). Social capital building and new business formation: A case study in Silicon Valley. *International Small Business Journal*, 29(2), 152–169.

Baron, R. A., & Markman, G. D. (2000). Beyond social capital: How social skills can enhance entrepreneurs' success. *Academy of Management Perspectives*, 14(1), 106–116.

Bauernschuster, S., Falck, O., & Heblich, S. (2010). Social capital access and entrepreneurship. *Journal of Economic Behavior & Organization*, 76(3), 821–833.

Björklund, T. & Krueger, N.F. (2016). Generating resources through co-evolution of entrepreneurs and ecosystems, *Journal of Enterprising Communities: People and Places in the Global Economy, 10*(4), 477-498.

Bolton, B., & Thompson, J. (2004), *Entrepreneurs: Talent, temperament, technique*. 2nd ed., Oxford, UK: Butterworth-Heinemann.

Borgatti, S.P., Everett, M.G. & Freeman, L.C. (2002). *Ucinet 6 for Windows: Software for Social Network Analysis.* Harvard, MA: Analytic Technologies.

Bourdieu, P. (1986). The forms of capital. In: J. G. Richardson (Eds.) *Handbook of Theory and Research for the Sociology of Education*, 241–258. New York: Greenwood Press.

Capello, R., & Faggian, A. (2005). Collective learning and relational capital in local innovation processes. *Regional Studies,* 39(1), 75–87.

Chatterji, A., Delecourt, S., Hasan, S. & Koning, R. (2019). When does advice impact startup performance? *Strategic Management Journal,* 40(3), 331–356.

Cohen, S. (2013). What do accelerators do? Insights from incubators and angels. *Innovations,* 8(3-4), 19–25. doi:10.1162/inov_a_00184.

Cope, J., Jack, S., & Rose, M. B. (2007). Social capital and entrepreneurship: An introduction. *International Small Business Journal*, 25(3), 213–219.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301–331.

De Carolis, D. M., Litzky, B. E., & Eddleston, K. A. (2009). Why networks enhance the progress of new venture creation: The influence of social capital and cognition. *Entrepreneurship Theory and Practice*, 33(2), 527–545.

Engel, Y., Kaandorp, M., & Elfring, T. (2017). Toward a dynamic process model of entrepreneurial networking under uncertainty. *Journal of Business Venturing*, 32(1), 35–51.

Etzioni, A. (2001). Is bowling together sociologically lite? *Contemporary Sociology*, 30(3), 223–224.

Ferri, P. J., Deakins, D., & Whittam, G. (2009). The measurement of social capital in the entrepreneurial context. *Journal of Enterprising Communities: People and Places in the Global Economy*, 3(2), 138–151.

Hallen, B. L., Cohen, S. L., & Bingham, C. B. (2020). Do accelerators work? If so, how? *Organization Science*, 31(2), 378–414.

Hoang, H., & Antoncic, B. (2003). Network-based research in entrepreneurship: A critical review. *Journal of Business Venturing*, 18(2), 165–187.

Kilduff, M., & Krackhardt, D. (1994). Bringing the individual back in: A structural analysis of the internal market for reputation in organizations. *Academy of Management Journal*, 37(1), 87–108.

Kwon, S. W., & Adler, P. S. (2014). Social capital: Maturation of a field of research. *Academy of Management Review*, 39(4), 412–422.

Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation.* Cambridge: Cambridge University Press.
Lin, N., Ensel, W. M., & Vaughn, J. C. (1981). Social resources and strength of ties: Structural factors in occupational status attainment. *American Sociological Review*, 46(4), 393–405.
Lin, N., Fu, Y. C., & Hsung, R. M. (2001). Measurement techniques for investigations of social capital. *Social Capital: Theory and Research*, 4, 57–81.
MacPherson, A., & Holt, R. (2007). Knowledge, learning and small firm growth: A systematic review of the evidence. *Research Policy*, 36(2), 172–192.
Mariotti, F., & Delbridge, R. (2012). Overcoming network overload and redundancy in interorganizational networks: The roles of potential and latent ties. *Organization Science*, 23(2), 511–528.
Ozgen, E. & Baron, R. A. (2007). Social sources of information in opportunity recognition: effects of mentors, industry networks, and professional forums. *Journal of Business Venturing,* 22, 174–192.
Parkkari, P. (2019). *Doing entrepreneurship promotion: A critical, practice theoretical study of entrepreneurship*. Acta electronica Universitatis Lapponiensis.
Phelps, C., Heidl, R. & Wadhwa, A. (2012). Knowledge, networks, and knowledge networks: A review and research agenda. *Journal of Management,* 38(4), 1115–1166.
Pirolo, L., & Presutti, M. (2010). The impact of social capital on the start-ups' performance growth. *Journal of Small Business Management*, 48(2), 197–227.
Pittaway, L., Gazzard, J., Shore, A. & Williamson, T. (2015). Student clubs: Experiences in entrepreneurial learning. *Entrepreneurship and Regional Development*, 27(3-4), 1–27.
Pittaway, L., Rodriguez-Falcon, E., Aiyegbayo, O., & King, A. (2010). The role of entrepreneurship clubs and societies in entrepreneurial learning. *International Small Business Journal*, 29(1), 37–57.
Podolny, J. M. (2001). Networks as the pipes and prisms of the market. *American Journal of Sociology,* 107(1), 33–60.
Preedy, S. & Jones, P. (2017). Student-led enterprise groups and entrepreneurial learning. *A UK perspective, Industry and Higher Education, 31(2*), 101-112.
Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York, US: Simon and Schuster.
Rajagopal, K., Joosten-ten Brinke, D., Van Bruggen, J., & Sloep, P. (2012). Understanding personal learning networks: Their structure, content and the networking skills needed to optimally use them. *First Monday*, *17*(1), 1-12.
Rienties, B., Heliot, Y., & Jindal-Snape, D. (2013). Understanding social learning relations of international students in a large classroom using social network analysis. *Higher Education*, 66(4), 489–504.
Rienties, B., Nanclares, N.H., Hommes, J., Veermans, K. (2014). Understanding emerging knowledge spillovers in small-group learning settings: A networked learning perspective. In V. Hodgson, M. de Laat, D. McConnell, & T. Ryberg (Eds.) *The design, experience and practice of networked learning. Research in networked learning*, xxx–xxx Springer, Cham.
Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243–263.
Saxton, T., Wesley, C. L., & Saxton, M. K. (2016). Venture advocate behaviors and the emerging enterprise. *Strategic Entrepreneurship Journal*, 10(1), 107–125.
Semrau, T., & Werner, A. (2014). How exactly do network relationships pay off? The effects of network size and relationship quality on access to start–up resources. *Entrepreneurship Theory and Practice*, 38(3), 501–525.
Shane, S. A. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*. Cheltenham, UK: Edward Elgar Publishing.
Shane, S. A. & Cable, D. (2002). Network ties, reputation, and the financing of new ventures. *Management Science,* 48(3), 364–381.
Shepherd, D. A., Souitaris, V., & Gruber, M. (2021). Creating new ventures: A review and research agenda. *Journal of Management*, 47(1), 11–42.
Siivonen, P. T., Peura, K., Hytti, U., Kasanen, K., & Komulainen, K. (2019). The construction and regulation of collective entrepreneurial identity in student entrepreneurship societies. *International Journal of Entrepreneurial Behavior & Research, 26*(3), 521–538.
Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies*, 23(9), 1759–1769.
Stuart, T. E. & Sorenson, O. (2008). Strategic networks and entrepreneurial ventures. *Strategic Entrepreneurship Journal,* 1, 211–227.
Taylor, D. W. & Thorpe, R. (2004). Entrepreneurial learning: A process of co-participation. *Journal of Small Business and Enterprise Development,* 11(2), 203–211.
Uzzi, B. (1999). Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing. *American Sociological Review*, 64(4), 481–505.
Walker, G., Kogut, B., & Shan, W. (1997). Social capital, structural holes and the formation of an industry network. *Organization Science*, 8(2), 109–125.

Westlund, H., & Gawell, M. (2012). Building social capital for social entrepreneurship. *Annals of Public and Cooperative Economics*, 83(1), 101–116.
Wright, M., Siegel, D. S., & Mustar, P. (2017). An emerging ecosystem for student start-ups. *Journal of Technology Transfer*, 42(4), 909–922.